Capital Structure in Saudi Arabian Listed and Unlisted Companies

Mohammed S Al-Dohaiman

Capital Structure in Saudi Arabian Listed and Unlisted Companies.

UNIVERSITY OF
STIRLING

A thesis submitted for the degree of Doctor of Philosophy

By

Mohammed S Al-Dohaiman

Department of Accounting and Finance
University of Stirling
Stirling
Scotland

April 2008

Declaration

This work has been conducted exclusively by my own research. Work in this thesis has neither been accepted nor is being submitted for any other degree. Work and analysis in this thesis has been conducted independently unless otherwise acknowledged.

Candidate:……..

Supervisor:…….

Date :……..

Acknowledgement

My gratitude first goes to the Almighty Allah, with His word: Qun Fa Yaqun (Qur'an 19: 35). I would like to express my sincere recognition to my principal supervisor Professor Alan Goodacre without whose high quality and friendly supervision, this work would not have come to completion. Sincere regards are also due to Dr. Kevin Campbell, who provided efficient supervision and academic advice during my study.

My sincere thanks go to my family for their support: my parents and my mother in-law who supported me emotionally; my wife and my kids Saleh, Norah, Sarah and Nowf for their love, encouragement and sacrifice, especially whenever I need their strength to move forward. I am also deeply grateful to my brothers, in particular Professor Ali and my sisters for their encouragement especially on difficult days. I am also deeply grateful to Engineer Abdullaziz Al-Namlah for his full support and courage before and during my study. I would like to thank most sincerely former minister of labour and social work Professor Ali Al-Namlah, governor of the technical and vocational training corporation Dr. Ali Al-Ghafis and vice governor Dr. Saleh Al-Amr for granting me the opportunity to make my study possible here in the UK. Special thanks go to Mr. Fallaj Al-Mansour, the former general manager of Companies General Department at the ministry of commerce and the current general manager Mr. Waleed Al-Rwaished and Mr. Abdulrahman Al-Hujab the joint companies and limited liability director for their help and full cooperation during the data collection process in Saudi Arabia.

Abstract

Although there have been many prior studies of the determinants of capital structure, most have investigated listed companies in countries with well-developed markets and institutions. The main objective of the present study is to extend prior research by investigating both listed and unlisted companies in Saudi Arabia where many cultural and institutional features may have an impact on financing decisions in a different manner to 'developed' countries. A further contribution is the application of a systematic statistical approach, using meta-analysis, to summarise the many prior empirical studies.

The empirical part of the study investigates 60 listed and 403 unlisted firms over the period 2000-2004 using several regression-based archival techniques including panel data analysis. Robustness checks are carried out to investigate the potential impact of the different methods and alternative measurement proxies.

The results show that, in general, companies in Saudi Arabia have substantially lower levels of debt than in many other countries. This finding is related to the very low tax regime and other environmental characteristics. Unlisted firms have more short-term debt but less long-term debt than listed firms, as found in other countries.

Despite the profound institutional differences, several firm-specific factors (such as firm size, asset tangibility, profitability, and liquidity) are found to have similar impacts on capital structure decisions in Saudi Arabia as they have in prior research. However, the impact of some factors is different, most

likely reflecting lower levels of agency costs in the Saudi Arabian institutional environment.

Table of content

Table of figures

List of tables

Appendices

Chapter 1: Introduction

The determination of capital structure has been one of the most contentious issues in the finance literature since Modigliani and Miller introduced their capital structure irrelevance prepositions in their seminal article in 1958. Since then, several theories have been developed suggesting a number of factors that might determine a firm's capital structure decision. However, out of these theories of capital structure, two models appear to come across strongly. One of them is the trade-off theory, which assumes that there are benefits and costs associated with the use of debt. In the beginning, the theory was limited to the trade off between the tax advantages of debt and bankruptcy costs. Then, it was extended to include benefits and costs of debt associated with agency conflicts. The other main theory is the pecking order hypothesis which assumes that, under information asymmetry between insiders and outsider, firms will resort to internally generated funds first to finance their growth, but when external financing is needed, firms prefer to raise debt before equity.

Empirically, numerous studies have been conducted to investigate the determinants of capital structure on the basis of these two theories. However, neither trade-off theory nor the pecking order hypothesis has found to provide robust and exclusive explanatory power. Nevertheless, Harris and Raviv (1991) conclude that it is necessary that empirical research be directed to test determinants of capital structure in various contexts. Motivated by their conclusion, this dissertation investigates the determinants of capital structure in the quite different context of Saudi Arabia.

This chapter is presented as follow: Section 1.1 introduces the statement of problems. Section 1.2 presents the research objectives, with Section 1.3

outlining the research methods while Section 1.4 establishes the expected contribution of the research. Finally, Section 1.5 demonstrates the structure of the dissertation.

1.1 Statement of the Problems

The question of what determines firms' choice of capital structure has been a major field in the corporate finance literature. A number of factors have been suggested to have an influence on a firm's capital structure decision. However, while there is a wide and growing body of empirical studies investigating the influence of these factors on the firms' capital structure, the findings of these studies are not always consistent in terms of the direction and strength of the relationship between leverage and its determinants. Given the large number of studies, it is perhaps surprising that no one has yet undertaken the important test of summarising the empirical evidence in a systematic manner. This would enable a much clearer understanding of the current state of knowledge.

Another issue is that the capital structure theories have very little to say about inter-country differences in corporate financing patterns. No existing theory explains how country-specific factors affect firm's capital structure. Cross-countries empirical studies (e.g. Rajan and Zingales, 1995; Booth et al., 2001; Giannetti, 2003; Fan et al., 2004; Hall et al., 2004; De Jong et al., 2007) assert that the influence of institutional characteristics is as important as the influence of firm's characteristics on corporate leverage level. However, our knowledge of capital structure has mostly been derived from a large volume of research conducted in developed countries with very little from developing

countries. Therefore, it is important to know how capital structure theories work in different countries, especially those with different traditions and institutional factors.

Moreover, a significant gap in the research has been in the determinants of capital structure for unlisted companies, probably due to the lack of data for those companies (Hall et al., 2004). It is quite likely that capital structures of unlisted companies will differ from listed companies since the former cannot gain stock market access. Accordingly, conducting analysis of both listed and unlisted companies and comparing the results may be particularly fruitful.

Finally, another issue in prior research is the robustness of results under different estimation techniques and different measures for both the dependent and the explanatory variables. Limiting the analysis to certain estimation techniques or to certain proxies for dependent or explanatory variables may lead the researcher to be subject to the significant results bias. Therefore, it is important to conduct a comprehensive analysis that considers these issues in order to avoid such bias.

1.2 Objective of the Research

The dissertation has several objectives. The first is to provide a systematic and comprehensive review of the empirical literature on the determinants of capital structure. This will provide a sound basis from which to proceed to address the other objectives.

The second objective of this dissertation is to test empirically the determinants of capital structure in Saudi Arabia. In order to achieve this objective, the following questions are formulated:

Do the tradition and institutional factors in Saudi Arabia have an influence on firms' capital choice decisions?

Do the determinants of capital structure identified in western settings have the same influence in Saudi Arabia?

Furthermore, given that unlisted companies are constrained from stock market access, the third objective is to answer the following questions:

Do unlisted firms' capital choice decisions differ from the decisions of listed firms?

Do the influences of firm-specific factors on capital structure identified for listed firms differ in unlisted firms?

Some prior research (e.g. Titman and Wassel, 1988; Bevan and Danbolt, 2002, 2004) identifies that differences in the measurement of both dependent and independent variables, as well as differences in estimation techniques can significantly affect the influences of a firm's capital structure determinants. Accordingly, the final objective of this dissertation is to provide a comprehensive analysis that investigates the robustness of the results under different estimation techniques and for different proxies. In the analyses, therefore, the findings will be compared to determine whether these issues are significantly affecting the results.

1.3 Research Method

A research method is a set of means used to collect and /or analyse data to fulfil the research objectives. There are various analysis methods, for example, analyses based on secondary data, interview, questionnaire, survey, and case study. The exploratory nature of this research suggests that the most appropriate approach is to undertake analysis based on secondary data. However, though the analysis is based in secondary data, there are two analysis phases.

Informed by the first aim, phase one involves synthesis using the meta-analysis technique. In accordance with literature in this area, the first step is to determine the scope of the literature, which is the topic of capital structure determinants in this dissertation. The next step is searching for prior studies. Then, identify the appropriate studies and extract the statistical data needed. The final step conducts the analysis and reports the finding.

Phase two, on the other hand, involves regression analysis techniques. Informed by the general literature and the other aims of this dissertation, this requires first extracting the data from the financial statements of listed and unlisted companies. However, due to no readily available computerised database in Saudi Arabia such as DataStream or Compustat, a field trip is required to collect the needed data[1], followed by manual data extraction. The final step involves regression analysis employing different techniques and different measures for both the dependent and explanatory variables.

[1] Datastream has data for just one Saudi Arabian company (SABIC).

1.4 Expected Contributions and significances of the research

Bearing in mind the above issues, the contribution of this study to the literature is therefore fourfold. First, to my knowledge, this is the first empirical work that statistically synthesises the finding of previous studies using meta-analysis to summarise and clarify the findings of prior studies. This analysis provides an insightful and useful framework for studying the variation in the findings of prior studies of capital structure determinants. Second, the study adds fresh empirical evidence to the determinants of capital structure in developing countries where there are relatively few studies. Third, in addition to listed companies, the study contributes to the literature by investigating also the capital structure determinants of unlisted companies, unlike most studies in this area, which exclusively focus on the listed companies. The study derives its importance also from its comprehensive analysis nature. Therefore, it is hoped to contribute to the literature where there are few studies investigating the sensitivity of the results under different estimation technique and different proxies.

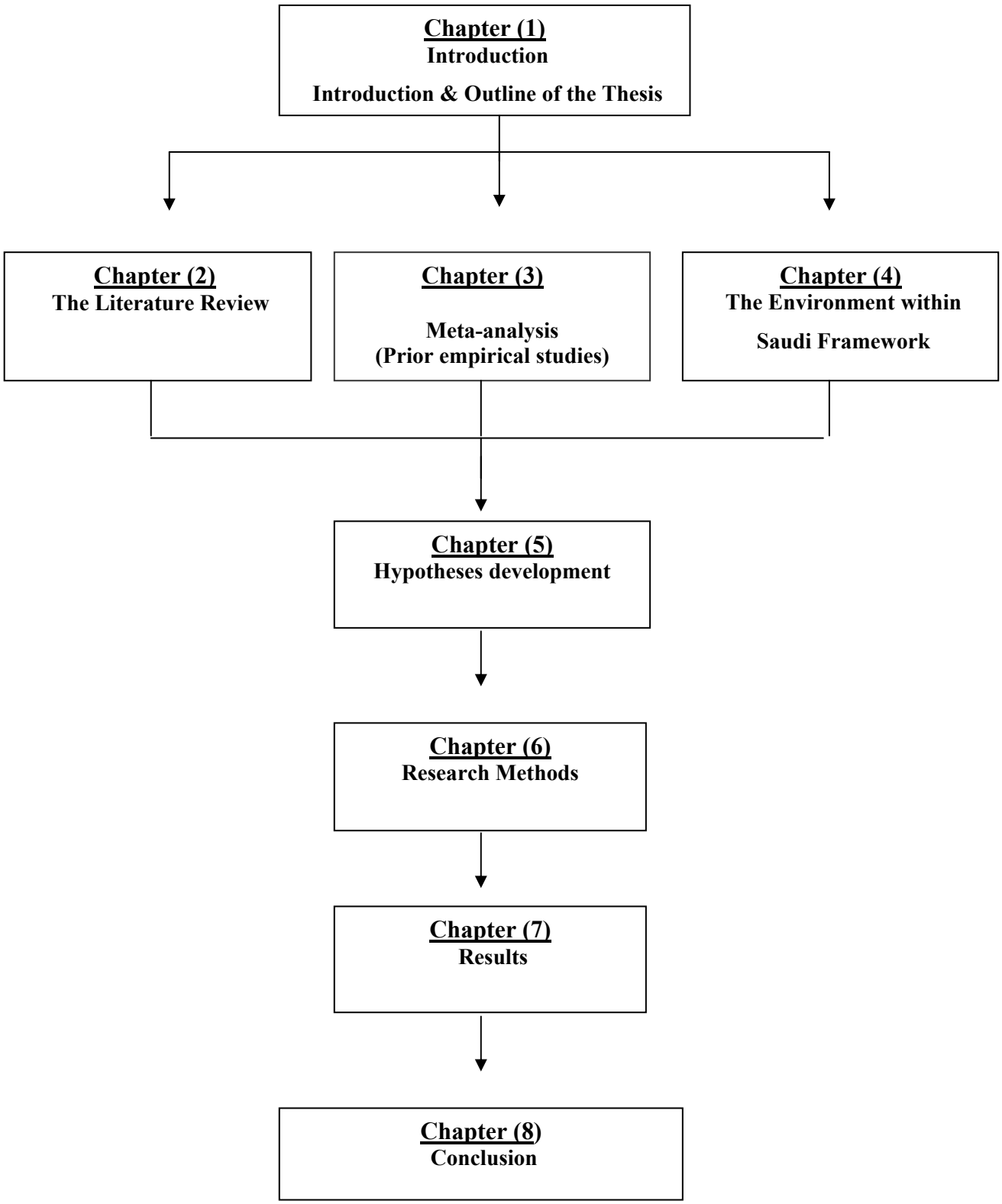
In addition to the contribution to the literature, the researcher anticipates the findings of this research will develop recommendations that may be useful in particular to the regulator body in Saudi Arabia as well as to academics and other researchers in general.

1.5 The Structure of the Thesis

The structure of the thesis is shown in Figure 1.1; the thesis is organized into eight Chapters. Following this introductory Chapter, Chapter 2 provides a literature review of capital structure. Chapter 3 presents the meta-analysis of

prior empirical studies. Chapter 4 explains the Saudi Arabia environment, with particular reference to the financing environment. Chapter 5 deals with the research hypotheses development, Chapter 6 deals with research methods and Chapter 7 presents the findings of the determinants of capital structure in the context of Saudi Arabia. Finally, Chapter 8 is the conclusion and presents the main findings arising from the empirical works, the limitations of the study and suggestions for future research.

Figure 1.1**: The Structure of the Thesis**



Chapter 2: Literature review

2.1 Introduction:

Over the past four decades, much of the corporate finance literature has rotated around different theories that try to fully explain factors behind financing policy and capital structure. These theories cover various aspects of the firm that can explain how firms choose their capital structure.

The current chapter presents a comprehensive theoretical and empirical literature review over the capital structure theme. Section 2.2 covers theoretical literature review. Section 2.3 covers theoretical prediction of variables that have been found by a large number of studies. Section 2.4 reviews prior empirical studies. Finally, section 0 provides chapter conclusion. Detailed analysis of the large number of empirical studies of the determinants of capital structure is deferred to chapter 3.

2.2 Theoretical literature review:

2.2.1 Modigliani and Miller propositions:

When reviewing the theoretical literature related to capital structure, one must start with the paper of Modigliani and Miller (1958). The authors assume a perfect capital market to derive their very well known propositions[2].

The Proposition I states that the firm's average cost of capital and hence the value of the firm (V) are independent of its capital structure. Therefore, there is no optimal capital structure that maximises the value of the firm (i.e. any

[2] Perfect market assumptions include:
1. Firms with the same degree of business risk are in homogenous risk class, 2. Investors have homogenous expectations about future corporate earnings and their levels of riskiness, 3. Securities are traded in perfect capital markets, 4. Interest rate on debt is the risk-free rate and 5. All cash flows are perpetuities.

level of leverage is as good as any other). Accordingly, in a perfect world, the value of the levered firm is equal to the value of un-levered firm. Proposition II states that the rate of return required by shareholders increases as more debt is used. In another word, any benefits from using debt would be offset by the corresponding higher cost of equity.

However, in reality, a perfect world clearly does not exist. Issues such as taxes, financial distress, asymmetric information, and conflicts between economic agents associated with the firm have an effect on the firm's capital structure. Subsequent theoretical works, thus, focus on these factors associated with market imperfections and their effects on the capital structure.

2.2.2 Models based on trade-off theory

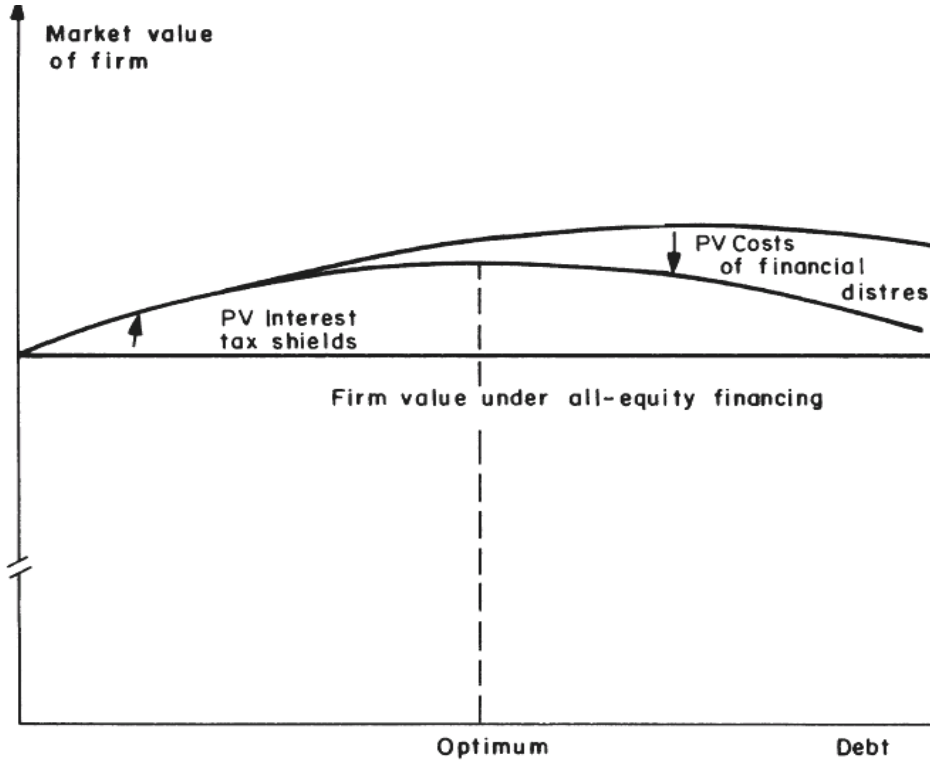
Trade off-theory assumes that there are benefits and costs associated with the use of debt as against equity and firms thus chose an optimal capital structure that trades off the marginal benefits and costs of debt. In the beginning, the theory was limited to the trade off between the tax advantages of debt against the bankruptcy costs. Then it was extended to include benefits and costs associated with the use of debt in mitigating the conflicts among the agent groups associated firm (i.e. managers, equity-holders and debt-holders).

2.2.2.1 The impact of tax on capital structure

In the first form of the static trade-off theory of capital structure, the trade-off between the tax advantage of debt and the costs of financial distress is expected to yield the optimal level of debt that maximizes the value of the firm (Myers, 1984).

Figure 2.1 shows a graphical representation of this theory. Here, the value of the firm rises as the firm uses more debt up to an optimum, where the benefits of additional debt through the increase in the present value of tax shield are offset by the costs due to the increased in the present value of costs of financial distress.

Figure 2.1: **The traditional static trade-off theory**



Source: Myers (1984)

The first paper take into account the corporate tax was the Modigliani and Miller (1963) tax correction article. The authors recognised that their perfect capital markets assumptions need modifying to allow for corporate tax in their propositions. They argue that debt typically offers a tax shelter, because interest is deducted before taxable profit is calculated. Thus, in the presence of corporate taxes, the value of the firm increases by an amount equal to the debt

tax shield. Modigliani and Miller (1963) demonstrate this argument mathematically in following equation.

$$\mathbf{V_L = V_U + TC^* D}$$

Where

$\mathbf{V_L}$ = the value of levered firm,

$\mathbf{V_U}$ = the value of un-levered firm,

TC = the corporate tax and

D = the value of used debt.

The main implication of Modigliani and Miller (1963) paper is that debt financing is highly advantageous and, in the extreme, a firm's optimal capital structure is 100 percent debt.

However, debt-holders and shareholders are also subject to tax on their security income, and this affects their after-tax returns. Miller (1977) suggests that, when the personal income tax on corporate share and interest is taken into account together with corporate income tax, the gain from corporate leverage (GL) can be expressed in following equation.

$$\mathbf{GL = \{1 - [(1 - TC) * (1 - TPS)] / (1 - TPB)\} * BL}$$

Where

TC = the corporate tax,

TPS = personal tax rate on income from corporate shares,

TPB = personal tax rate on income from bonds and

BL = the market value of the firm's debt.

Miller (1977) shows that the tax gains from issuing debt at the corporate level will be exhausted at the personal tax level and, thus, the value of the firm, at equilibrium, is irrelevant to its capital structure. If markets are perfect (i.e. no taxes) then the gain from debt is equal to zero and as Modigliani and Miller (1958), indicating capital structure is irrelevant. In the special case where the two personal tax rates are equal, the gain from leverage reduced to TC* BL gives exactly the expression in the Modigliani and Miller (1963) tax model. However, when the tax rate on income from corporate shares (TPS) less than the tax rate on income from bonds (TPB), the gain from leverage will be less than (TC* BL). Moreover, when the rate satisfy that (1 - TC) * (1 – TPS) = (1 – TPB), the gain from leverage vanishes entirely.

DeAngelo and Masulis (1980) further argue that firms usually have pre-existing non-debt tax shields such as depreciation and investment tax credits will face an increasing probability of financial distress as debt increases. Thus, firms with large non-debt tax-shields will have less debt in their capital structure, because the non-debt tax-shields are substitutes for the tax benefits of debt financing.

However, the trade-off theory was extended to include benefits and costs associated with the use of debt in mitigating the conflicts among the agent groups associated with the firm (i.e. managers and equity-holders and debt-holders).

2.2.2.2 The impact of conflicts among the agent groups on capital structure:

The seminal work on agency theory and capital structure is Jensen and Meckling (1976). They identified two types of conflicts that are a major

source of agency costs and these are: agency costs that arise due to the conflicts of interest between managers and shareholders and agency costs that arise as a result of the conflicts of interest between shareholders and debt-holders.

2.2.2.2.1 Conflicts of interest between managers and shareholders:

According to Jensen and Meckling (1976), conflicts arise between managers and shareholders when managers hold less than 100% of the residual claim. Consequently, managers capture only a fraction of the gain from their profit enhancement activities, while they bear the entire cost when they refrain from investing in such activities. Hence, managers are expected to pursue excessive perquisite consumption and not invest in activities that would maximise the value of the firm.

To mitigate this kind of conflict, different analysing approaches have been proposed. Jensen and Meckling (1976) argue that the larger is the fraction of equity held by managers, the more they concentrate their energies on enhancing firm value. They also argue that if the absolute investment by managers is held constant, the use of debt provides a vehicle for increasing managers' share-holdings and, thus, mitigate the conflicts of interest between managers and shareholders. Jensen (1986) further argues that managers will attempt to avoid shareholder control by using internal funds (i.e. free cash flow) to expand the firm size beyond the optimal size and to accept projects with a negative net present value (i.e. over-investment). Shareholders can prevent management from undertaking such action by reducing the free cash flow through increasing the firm's debt. The presence of debt causes the

manager to pay out the cash flow as an interest and repayments. Moreover, debt-holders will have the firm declared bankrupt if the firm cannot meet its obligations to them. Grossman and Hart (1982) argue that if bankruptcy is costly for the managers because they lose benefits of control and reputation, then an increase in leverage can commit managers to generate the necessary cash flows to meet debt repayments and consequently reducing the possibility of management engaging in excessive perquisites.

Another form of conflict between managers and shareholders is that managers and shareholders may also disagree over a firm's operating decisions. Harris and Raviv (1990) and Stulz (1990) formalise this conflict and the role of debt to mitigate this disagreement. In Harris and Raviv (1990), because of managers' personal loss of control and reputation, they will in general wish to continue operating the firm even when shareholders desire liquidation. They argue that debt mitigates this conflict through the debt-holders' option to liquidate the firm in the event of default, which would also benefit shareholders if liquidation was the best strategy. Therefore, high leverage is likely to be associated with higher firm's liquidation value, and lower probability of reorganisation following the default. In Stulz (1990), on the other hand, managers may prefer to invest all available funds even if shareholders want to be paid dividends. He argues that increasing debt level can mitigate this divergence since debt payment reduces the amount of free cash available to managers. Therefore, as in Jensen (1986), firms with high free cash flow and with low growth opportunities are expected to have high debt levels.

2.2.2.2.2 Conflicts of interest between shareholders and debt-holders:

Different fundamental sources of equity-holders and debt-holders conflicts have been identified in the agency cost literature. Jensen and Meckling (1976) identify the asset substitution problem that arises in the case when shareholders may seize wealth from debt-holders by switching from safer to riskier and value-decreasing investments (i.e. asset substitutions). Myers (1977) points to the under-investment problem that arises in the case where a firm in financial difficulties has an incentive to sacrifice low positive net present value projects whose benefits accrue mainly to debt-holders. He further argues that the greater the investment opportunity in a firm, the greater is the potential conflict of interest between shareholders and debt-holders.

To mitigate such conflicts, Smith and Warner (1979) suggest using restrictive covenants on debt such as include interest coverage requirements or prohibitions against investing in new unrelated lines of business. However, restrictive covenants themselves also involve costs in which they reduce management flexibility by restricting the firm's investment and financing opportunities. Smith and Warner (1979) also suggest that secured debt may provide the issuer with a means to mitigate agency costs of debt. Alternatively, firms may use convertibility option, where debt-holders have the option to convert to shareholders, to mitigate the agency costs of debt. Jensen and Meckling (1976) argue that conversion rights enable debt-holders to recapture any positive wealth transfers to shareholders and to gain from any increase in risk. Maturity of debt is another option that firms can use to mitigate agency costs. The use of short-term debt may mitigate the agency problems. Myers (1977) observes that if debt matures before growth options

are exercised, the firm's incentive to deviate from a firm-value-maximizing exercise policy is eliminated. Billett et al (2007) argue further that short-term debt can mitigate both under- and over-investment incentives by making the debt less sensitive to changes in firm value and by allowing for more frequent re-pricing of debt.

In an alternative approach, Diamond (1989) argues that managerial reputation plays an important role in mitigating the conflicts between shareholder and debt-holder, mainly asset substitution problem. He suggests that the longer the period of non-default, the better is a firm's reputation as a safe firm, and the lower will be its borrowing costs. This suggests that older firms will choose the safe project to maintain reputation. Younger firms with a lesser reputation may choose risky projects with higher prospective returns, but, if they survive, they will eventually choose the safe project.

In sum, the extended static trade-off theory suggests that benefits of issuing debt can be traded against their costs to determine the optimal level of debt that will maximise the value of the firm.

2.2.2.3 Dynamic trade-off theory:

One of the main criticism directed to the static form of trade-off theory is that the firm is always at an optimal point, where the observed debt level is assumed to be equal to the optimal one. In reality, the decisions are often dynamic and adjustments to firm-specific optimal debt levels are costly and, thus, firms usually restructure their capital structure over time. Myers (1984) emphasises this point and argues that there must be costs and time lags involved in adjusting to the optimal capital structure when events cause a firm

to deviate from the optimal level. He further concludes that if adjustment costs are large then we ought to give less attention to refining our static trade-off stories and put relatively more emphasis on understanding what adjustment costs are, why they are so important and how rational managers would respond to them. Fischer et al. (1989) argue that fixed costs of adjustment imply that firms allow debt level to fluctuate until it becomes too extreme, and then they restructure it.

In sum, the dynamic form of trade-off theory assumes that the actual capital structure of a particular firm at a particular moment in time does not necessarily equal the target capital structure of that firm but firm dynamically adjusts its capital structure to a moving target. Therefore, the dynamic form in which both taxes and agency concerns are present provides more comprehensive picture than the static form about the mechanism of the capital structure decision over time.

2.2.3 Models based on asymmetric information:

Asymmetric information is another dimension of the capital structure theories. It is generally thought there is asymmetric information between firm managers (or insiders) and outside investors. There are two main approaches that have been developed in the literature of asymmetric information. In the first approach, Myers and Majluf (1984) and Myers (1984) argue that the capital structure is designed to mitigate inefficiencies in the firm's investment decisions that are caused by information asymmetry. In the second approach, Ross (1977) and Leland and Pyle (1977) assert that firm's capital structure

choice is used as a means to signal to outside investors the information held by insiders.

2.2.3.1 Pecking order and modified pecking order hypothesis:

Myers (1984), Myers and Majluf (1984) works are the seminal contribution to this literature. They provided a theoretical justification for Donaldson's (1961) findings that firms prefer to use internally generated funds as a financing source and resort to externals funds only if the need for funds was unavoidable. In their prospective, the nature of the asymmetric information is that managers or insiders are assumed to possess more information about their firms' prospects, risks and values than outside investors.

Myers and Majluf (1984) argue that the capital structure can help to mitigate inefficiencies in a firm's investment decision that are caused by information asymmetries. They demonstrate that if there is an asymmetry of information between investors and firm insiders, then the firm's equity may be under-priced by the market. As a result, new equity, which is used to finance new investment projects, will be also under-priced. Therefore, if management has favourable inside information and acts in the best interest of the existing shareholders, then management will refuse to issue equity even if it means passing up positive NPV projects because the net loss to existing shareholders (due to under-pricing problem) might outweigh the project's NPV. On the other hand, passing up NPV projects is contrary to the wealth maximization. Using financial sources that may not be undervalued by the market, particularly internally generated funds could solve this under-investment problem.

Accordingly, the existence of sufficient internal finance allows firms to accept desirable investments without relying on costly external finance. Myers and Majluf (1984), argue that firms are most likely to generate financial slack (i.e. liquid assets such as cash and marketable securities) to be used for internal funding. Thus, in order to protect present shareholders, firms with financial slack and in the presence of asymmetric information, will not issue equity, even though it may involve passing up a good investment opportunity. If investors realize this point, then the market will take the decision not to issue shares as good news. On the other hand, if management does offer a new share issue, it will be interpreted as a bad news, and the firm's share issue will be under-priced.

This adverse selection problem has an influence on the choice between internal and external financing. This choice lead to the Pecking Order Hypothesis, which Myers (1984) summarised as following:

Firms prefer internal finance.

Firms adjust their target dividend payout ratios to their investment opportunities, although dividends are sticky and target payout ratios are gradually adjusted to shifts in available investment opportunities.

Sticky dividend policies as well as unpredictable fluctuations in both profitability and investment opportunities mean that internally generated funds are more or less than investment outlays. If internally generated cash flow is less than investment outlays, the firm first exhausts its cash balances or marketable securities portfolio.

If external financing is required, firms will resort to the safest security first. They start with debt, then hybrid securities such as convertible bonds and finally equity as a last resort.

A single optimal or target debt-equity ratio does not exist in the pecking order theory since financing decision does not rely on the trade off between marginal benefits and costs of debt. Moreover, there are two types of equity, internal and external; one is at the top of the pecking order and one at the bottom. A firm's leverage ratio thus changes when there is an imbalance between internal funds and real investment opportunities.

Moreover, Myers (1984) introduced implication similar to the pecking order theory known as the modified pecking order theory. In this framework, both asymmetric information and costs of financial distress are incorporated. Myers argues that as firm climbs up the pecking order it faces higher probability of both incurring costs of financial distress and passing up future positive-NPV projects. Thus, firm may rationally decide to reduce these costs by issuing stock now though new equity is not needed immediately to finance real investment, just to obtain financial slack and move the firm down the pecking order.

2.2.3.2 Signalling with proportion of debt:

In this approach, it is assumed that the investment opportunity is fixed and the choice of capital structure signals to outside investors the private information of insiders. The seminal contribution in this area of literature is due to Ross (1977). In his model, Ross assumes two types of firms (high quality with high leverage and low quality with low leverage) that have different prospects and

that these are known by managers but not by investors. Moreover, managers benefit if the company's securities are more highly valued by the market but are penalized if the firm goes bankrupt. Under such circumstances, the level of debt the company managers choose serves as a signal about the quality of the company, a signal sent from the managers as possessors of private insider information towards outside investors. Since lower quality firms have higher marginal expected bankruptcy costs for any debt level, managers of low quality firms do not imitate higher quality firms by issuing more debt. Therefore, higher leverage is a "good signal" in this model.

The Ross's model has two main empirical implications. First, the probability of bankruptcy rises as the amount of debt issued by the firm increases. Second, the value of the firm is positively related to its leverage ratio. Thus, the firm value, leverage, and bankruptcy are all positively related.

Leland and Pyle (1977) develop a model of capital structure and financial equilibrium where an entrepreneur who wants to undertake an investment project and plans to hold a certain fraction of the firm's equity and the remaining is raised from outside lenders. Since entrepreneur is known to be a risk-averse, he will choose a high fraction in a risky project only if he confident about its success. Thus, in the signalling equilibrium, the market inferred the amount of equity retained by the entrepreneur as a signal of the firm quality.

2.2.4 Models based on the market for corporate control:

This literature explains the firm's choice of capital structure by utilizing the fact that common stockholder carries voting rights while debt-holder does not.

Here, the capital structure has indirect influence on the result of the takeover contests through its effect on the distribution of votes particularly the portion that held by the manager. Several models have been proposed in the literature regarding this concept.

Harris and Raviv (1988) develop a model where the incumbent manager changes his ownership in the firm's equity by altering firm's capital structure to direct the outcome of takeover contests. The manager chooses his optimal ownership by trading off capital gains on his stake against the loss of any personal benefits derived from being in control. Since manager can increase his stake by issuing debt to repurchase equity from the passive investors, he well chooses the debt level that determines his optimal stake and, thus, maximizes his payoff. The main predictions of Harris and Raviv (1988) model are: first, that takeover targets will raise their debt on average. Second, debt issues on average are accompanied by stock price increase.

Stulz (1988) shows that the shareholders could have influence on the outcome of a takeover attempt by changing stake of incumbent manager. He argues that increasing the fraction of manager's ownership (which is financed by issuing debt) reduces the probability of a successful tender offer but increases the takeover premium paid by rival and the value of investors' equities if a tender offer is made. Therefore, the optimal debt level is that maximizes the value of investor's equity.

The main predictions of Stulz's model are: first, that takeover targets will have more debt than firms that are not targets; second, that changing of debt for equity are accompanied by stock price increase; and third, that there is a

negative relationship between the probability of a successful tender offer and target's leverage ratio; finally, that there is a positive relationship between the takeover premium and target's leverage ratio.

Israel (1992) uses another model where capital structure has an effect on the distribution of cash flow between shareholders and nonvoting debt-holders such as debt and preferred stocks. Here, the optimal debt level involves trading off the increase in the gain to target's shareholders against the decrease in the probability of the acquisition. The main implications of Israel's model are: first, there is a negative relationship between the probability of firms becoming takeover targets and their leverage ratio; second, there is a positive relationship between the gain to target's shareholders and leverage ratio; third, target's debt value, target's stock price and acquirers' firm value increase when acquisitions are initiated.

2.2.5 Models based on industrial organization theory:

This section of literature presents the models that establish the link between capital structure and industrial organization theory. The connections between the firm's capital structure and industrial organization theory could be explained through two approaches: First, models that concern the relationship between firm's capital structure and its competitive strategy. Second, models that consider the relationship between firm's capital structure and the characteristics of its products or inputs.

2.2.5.1 Capital structure and the firm's competitive strategy:

This approach of literature starts from industrial organization and firm's strategic management in order to determine capital structure. In particular, it considers the relationship between the firm's capital structure and its strategy when competing in the product market.

Brander and Lewis (1986) develop a model where two firms are engaged in a competition and face uncertainty demand. They argue that financial decisions affect output market strategies because of the limited liability of equity holders (i.e. levered equity holders receive payoffs only in good states). Therefore, debt financing creates an incentive for the firm to adopt an aggressive output policy.

Maksimovic (1988) studies the interaction between the financing choice and product market decisions by modelling profits in terms of demand and cost functions and number of firms. He shows that debt capacity rises with elasticity of demand and declines with the discount rate.

2.2.5.2 Capital structure and the characteristics of firm's products or inputs:

This approach concerns identifying product (input) or product market (input market) characteristics that interact in a significant way with the debt level. The basic idea here is that debt influences interaction with firm's non-financial stakeholders (i.e. customers, workers and suppliers). According to Titman (1984), customers might incur costs such as inability to obtain the product, parts, and/or related services following a firm’s liquidation. These costs are transferred to the shareholders in the form of lower prices for the firm's product. Titman (1984) shows that the cost imposed on customers when a

producer goes out business (bankrupt) is higher for unique and/or durable companies, than for non-durable products or those made by more producers. This in turn leads to the result that firms that produce unique products use less debt to avoid the possibility of bankruptcy.

Leverage may also have an effect on the shareholders' bargaining position in relation to their input suppliers. Sarig (1998) argues that employees of highly leveraged firms can negotiate better contract terms than can employees of less leveraged firms since highly leveraged firms are more susceptible to employees' threats to seek alternative employment than less leveraged firms. Consequently, firms that require skilled employees might be expected to have lower debt to protect themselves against employees' negotiating threat. Moreover, this effect of leverage is not limited to negotiations with employees but also may affects negotiations with any supplier of specialized production factors.

2.3 Theoretical Prediction

Harris and Raviv (1991) argue that theories of capital structure have identified a large number of potential factors that might have an impact on debt levels. Among these factors which have been found by a large number of studies to influence the firm's capital structure are size, tangibility, profitability, risk, tax, growth, uniqueness, dividends, free cash flow, liquidity, age and percentage of outstanding shares held by the government. However, there is significant disagreement among the capital structure theories, in particular, between the trade-off and the pecking order theories about the influence of some factors on the firm's capital structure. In this section, therefore the

discussion involves the viewpoints of the capital structure theories about the effect of these attributes on leverage ratios.

2.3.1 Size

It seems there is an agreement between theories about the positive effect of size on firm's capital structure though their explanation differs. From the point view of the trade-off theory, firms trade-off between the benefits of leverage such as tax savings or mitigation of agency problems against the costs of leverage such as the costs of bankruptcy. Rajan and Zingales (1995), however, argue that large firms tend to be more diversified and so suffer bankruptcy less often. Accordingly, an observed positive dependence is expected between leverage and firm size. Alternatively, because of information asymmetries, smaller firms are likely to face higher costs for obtaining external funds. Moreover, Bevan and Danbolt (2002) argue that due to credit rating, large companies are more likely to have access to non-bank debt financing. In turn, this too would suggest a positive relationship between size and debt.

2.3.2 Tangibility

Titman and Wessels (1988) and Harris and Raviv (1991) argue that tangibility might be the major factor in determining the firm's debt levels. Theoretically, Jensen and Meckling (1976) argue that issuing debt increases the shareholders motivation to invest sub-optimally in high-risk projects, taking advantage of the possibility of increasing their benefits at the expense of increasing the risk, which is passed on to the debt-holders, who are the ones that would suffer the possible losses. However, if debt is secured against assets, the borrower is

restricted to using loaned funds for a specific project, and creditors have an improved guarantee of repayment. Thus, firms with high level of fixed assets would have higher level of debt. Bevan and Danbolt (2002), however, argue that if the tangibility provides a reasonable proxy for the availability of depreciation tax shields, the tax-based hypothesis of DeAngelo and Masulis (1980) would expect a negative rather than a positive association between leverage and tangibility.

2.3.3 Profitability

There are no consistent theoretical predictions on the influence of profitability on firm's capital structure. From the point view of the trade-off theory, the more is the firm profitable, the higher the leverage should be due to debt tax deductibility of interest payment. Rajan and Zingales (1995), further, argue that debt suppliers should be more willing to lend to profitable firms. Accordingly, a positive dependence is expected to be observed between leverage and profitability. On the other hand, the main argument supporting a negative relationship between leverage and profitability comes from the pecking order theory. Myers (1984) and Myers and Majluf (1984) argue that, as a result of information asymmetry between corporate insiders and the market, investors may under price firm's equity. If firms finance new projects by issuing equity, the net effect is that new investors obtain a higher gain from this investment than pre-existing shareholders, which may cause the project not to be accepted on these grounds even when it has a positive NPV (under investment problem). To avoid such problems, internal funds and even debt that is not too risky will be preferred to equity. Accordingly, firms will prefer

to finance from retained earnings first, then from debt and finally from issuing new equity. This, in turn, suggests a negative relationship between profitability and debt ratios.

2.3.4 Risk

The theoretical literature argues that firms with high variability in earnings have a greater risk not to meet their debt obligations, so increasing the probability of default. Thus, lenders will be less willing to lend or will charge a higher risk premium since they will have a greater probability of losing their money. DeAngelo and Masulis (1980) argue that the cost of debt will increase for firms that have variability in their earnings since investors will not be able to accurately predict future earnings based on publicly available information. Bradley et al. (1984) argue further that the variability of the firm value expected to show negative influence on the debt ratio when the costs of financial distress are significant. Consequently, this suggests an inverse relationship between risk and leverage.

2.3.5 Tax

Modigliani and Miller (1963) argue that firms with high tax liabilities are expected to utilize greater amounts of debt to take advantage of the deductibility of interest payments. Accordingly, a positive association between debt and tax is expected. However, Graham et al (1998) argue that corporate tax is endogenous to financing decisions, which induces a spurious negative association between debt ratios and marginal tax rate (MTR). They demonstrate that including the interest expense in the tax rate computation would cause a decline in the MTR. In this case, firms with high level of debt

will associated with a low observed MTR and, thus, a negative relationship will be observed between debt level and tax proxy. Accordingly, they suggest using before financing marginal tax rate (i.e. after removing the effect of interest tax shield from MTR calculation).

Alternatively, DeAngelo and Masulis (1980) incorporate the effect of corporate taxes, personal taxes, and non-debt tax shields in their model of optimal capital structure. Their argument is that tax deductions for depreciation, losses, and investment tax credits are substitutes for the tax benefits of debt financing. Accordingly, this suggests that firms with greater non-debt tax shields expected to have lower levels of debt.

2.3.6 Growth

Myers (1977) argues that the under-investment and asset substitution issues are likely to be more severe for firms with great growth opportunities and, thus, such firms should use less debt in order to mitigate these agency problems. Titman and Wessels (1988) further argue that since growth opportunities are capital assets that add value to the firm but cannot be collateralised, the costs associated with agency conflicts between equity and debt holders is expected to be higher for firms in growing industries. Accordingly, a negative relationship between debt and growth opportunities suggested. Pecking-order hypothesis also suggests a negative relationship between leverage and growth opportunity. According to Myers and Majluf (1984), information asymmetry demands an extra premium for firms to raise external funds irrespective of the true quality of their investment project. In the case of issuing debt, the extra premium is reflected in the higher required

yield. Therefore, firms with growth opportunities may find it too costly to rely on debt to finance its growth. Myers (1977), however, argues that these agency problems can be mitigated if the firm issues short-term debt rather than long-term debt. This would suggest that growth to have a negative relationship with long-term debt and a positive relationship with short-term debt.

2.3.7 Uniqueness

Titman (1984) argues that firms, which produce unique or specialised products, use less debt to avoid the possibility of going out of business since the costs imposed on their customers, workers and suppliers are relatively high in the event of liquidation. Accordingly, an inverse relationship between uniqueness and debt ratios is expected.

2.3.8 Dividends

According to the pecking order hypothesis, firms prefer to use internally generated funds and if external funds are needed, firms prefer to raise debt before equity. One of the main predictions of the pecking order hypothesis is that there is a negative interaction between dividend payout and investment opportunity because higher dividend payout lower the retained earning and that increase the need for the use of external source of fund (i.e. debt) to finance growth opportunity (Baskin 1989; Allen, 1993 and Adedeji, 1998). Therefore, a positive relationship is expected between dividends and debt ratios. On the other hand, dividends and debt are substitutes for controlling the free cash flow agency problem (Stulz, 1990), which would suggest a negative relationship between dividends and debt ratios.

2.3.9 Free cash flow

Agency theory argues that debt reduces the amount of the free cash flow available to managers to involve in personal benefit activities since debt commits the firm to serve its debt payments (Grossman and Hart, 1982; Jensen, 1986 and Stulz, 1990). Accordingly, this would suggest a direct relationship between free cash flow and leverage. On the other hand, if the free cash flow represents the capacity of the firm's internal generated resources, the pecking order theory would suggest an inverse association between free cash flow and leverage.

2.3.10 Liquidity

According to pecking order hypothesis, in the presence of asymmetric information, firms with financial slack (i.e. liquid assets such as cash and marketable securities) will prefer internal sources to finance future investments. Accordingly, firms with higher liquidity ratio are expected to have lower leverage.

2.3.11 Age

Diamond (1989) argues that aged firms with a long history of credits will have relatively low default probability and lower agency costs using debt financing than newly established firms. Accordingly, a positive relationship is expected between age and debt ratio. On the other hand, according to pecking order hypothesis, firms prefer raising funds first from retained earnings and resort to external funds only if the former is insufficient, in which issuing debt is preferred over issuing equity. Therefore, young firms are more likely to

depend on debt instruments since they do not have sufficient funds internally to finance new investment. Hall et al. (2004) argue that new firms will not have had time to cumulate funds and may be forced to borrow. This suggests an inverse relationship between age and debt ratio.

2.3.12 Government

Theoretically, the impact of the government as large shareholders on leverage is ambiguous. On one hand, Jensen (1986) argues that the use of debt can minimize the conflicts between management and shareholders. Accordingly, the presence of shareholders owning large percentages of equity shares (in this case government) in a firm may have incentives to use debt to reduce the ability of the management from engaging in the consumption of excessive perquisites. Moreover, Leland and Pyle (1977) argue that the market inferred the amount of equity retained by the entrepreneur as a signal of the firm quality. The government ownership, therefore, will signal to the lenders the firm's guaranteed solvency. Accordingly, these arguments would suggest a positive relationship between government ownership and debt ratio. On the other hand, the presence of the government as large external shareholders may also force managers to engage in activities that benefit shareholders at the expense of debt-holders such as asset substitution (Myers, 1977). This would suggest an inverse relationship between debt and government attribute.

2.4 Review of prior empirical studies:

The purpose of this section of the literature review is to provide a wide range of the relevant empirical studies related to the area of capital structure. Prior empirical studies in this area can be divided into two main approaches of

which the first approach involves a survey-based analysis while the second involves regression analysis using company's accounting data.

This section proceeds as follow: Section 2.4.1 goes over the prior survey based studies. Section 2.4.2 reviews prior regression based studies examining specific theory. Section 2.4.3 reviews prior regression based studies examining general capital structure themes.

2.4.1 Prior empirical studies survey-based analysis:

As an attempt to narrow the gap between theory and the behaviour of financial managers in practice, some studies adopted survey methodology. In this approach, company or financial managers have been asked about their views and behaviour regarding capital structure decisions, in particular, their views on issues related to the two dominant theories (i.e. pecking order and trade-off theories). Following are the studies that have been carried out adopting survey approach.

Donaldson (1961) conducted an interview survey on 25 large US firms. Consistent with pecking order hypothesis, he found that management strongly prefer to use internal generation as a source of new funds and resort to external funds only if the need for funds was unavoidable. With a response rate of 21% of the 468 industrial firms surveyed from the 1984 fortune 500, Norton (1989) found that financial managers preferred to use internal resources first and in the case where external financing is needed, debt is used more than equity due to the tax deductibility of interest payments. However, factors dealing with bankruptcy costs, agency costs and information

asymmetries were found to have little effect on financial decision makers' behaviour.

Graham and Harvey (2001) carried out a survey on 392 CFOs of US firms, which represents a response rate of 8.5%. In their analysis of capital structure responses, they found financial flexibility and credit ratings were the most important debt policy determinants whereas earnings per share dilution and recent stock price appreciation were the most important determinants influencing equity issuance. Moreover, while a moderate support was found for both the pecking order and trade-off theories, issues related to asset substitution, asymmetric information, transactions costs, free cash flows and personal taxes were found to have little effect on executives' financial decisions.

In countries other than US, Allen (1991) interviewed senior financial personnel of 48 listed Australian companies. He found that 93 % of the respondents were found to pursue a policy of maintaining spare debt capacity. Relatively consistent with pecking order prediction, 52.1 % of the respondents preferred to fund their business by internal funding sources. Moreover, some evidence on target debt ratios and tax considerations of debt is found.

More recently, Beattie et al (2006) conducted survey on 192 financing directors of UK listed companies, which represents a response rate of 23%. The main finding is heterogeneity among companies regarding capital structure policies, in which about 50% respondents seek to maintain a target debt level (i.e. consistent with trade-off theory) and 60% claim to follow a financing hierarchy, (i.e. consistent with pecking order hypothesis). The

respondents, however, did not view these two theories as either mutually exclusive or comprehensive. Moreover, company size is found to have an important influence on corporate financing decisions. Broadly, theoretical arguments related to interest tax shield, financial distress, agency costs and information asymmetry were found to be acceptable by respondents.

In international comparisons, Bancel, and Mittoo (2004) carried out a survey on CFOs of 87 firms in 16 European countries with a response rate of 12%[3]. In comparison to Graham and Harvey (2001) study, they found that European managers use factors similar to those used by their U.S. counterparts for their financing decisions. However, there were differences among European countries on several dimensions, particularly between Scandinavian and non-Scandinavian countries. Country's institutional structure, especially the quality of its legal system was found an important determinant of debt policy. Financial flexibility and earnings per share dilution were the managers' primary concerns in issuing debt and common stock respectively. Most firms determined their optimal capital structure by trading-off factors such as tax advantage of debt, or bankruptcy costs, agency costs, and accessibility to external financing.

2.4.2 Empirical results concentrated on the testing of specific theories

Many studies have investigated the process of how firms chose their debt/equity level in the framework of the two leading theories, namely, the

[3] Countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Holland, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

pecking order hypothesis and trade-off theory. This subsection, thus, organised based on either study tests pecking order hypothesis or it examines trade-off theory or both.

A limited number of studies directly test the pecking order theory using specific econometric models. Baskin (1989) examined the pecking order hypothesis directly by using structural model. The key finding is that the payments of high levels of past dividends reduce the amount of the retained earnings and, thus, increases the demand for debt. Studies carried out by Klein and Belt (1993); Allen (1993) and Adedeji (1998) also have directly tested the pecking order theory and find support for it. On the other hand, Frank and Goyal (2003) tested the pecking order theory using system equations. Inconsistent with the prediction of the pecking order theory, their results show that external funding is largely used, and debt financing does not dominate equity financing in magnitude. Moreover, net equity issues track the financing deficit more closely than do net debt.

On the other hand, much of the empirical work in this area has focused on the static and dynamic trade-off theories. An early study that tested trade-off theory adopting a static approach is Taggart (1977). The author found that movements in the market values of long-term debt offset by movements in the market of equity and, thus, firms adjust toward a target debt/equity ratio. Marsh (1982), Opler and Titman (1994), Hovakimian et al (2001) also found evidence that firms appear to adjust toward debt targets which is consistent with the prediction of the trade-off theory. However, these studies have been

conducted using static approach in which they assume that observed ratios equal optimal ratios and the adjustment to the target is costless.

Recently, studies have extended traditional static models by introducing dynamics into the capital structure choice in which firms dynamically adjust their capital structure to target and the adjustment is costly. Jalilvand and Harris (1984) used system equations to estimate their target-adjustment model. They found that firms adjust gradually toward long-run financial targets. Firm size, interest rate conditions, and stock price level were found to be the main factors affecting the cost and the speed of adjustment. Large firms appeared to adjust to the long-term debt target faster than small firms do. Fischer et al. (1989), Gatward and Sharpe (1996), DeMiguel and Pindado (2001), Ozkan (2001), Bhaduri (2002), Mayer and Sussman (2004), Gaud et al. (2005) and Kayhan and Titman (2007) also provide evidence that firms have target ratios and adjust dynamically to the target ratio with different costs and different speeds.

Finally, a few studies have sought to distinguish which of the two main theories (the pecking order hypothesis and trade-off theory) best explains capital structure practice. Shyam-Sunder and Myers (1999) perform a simulation test for the two models and conclude that the pecking order hypothesis is an excellent first-order approximation of actual corporate financing behaviour. Chirinko and Singha (2000), however, criticize Shyam-Sunder and Myers's test and show that their "elegantly simple" test generates misleading inferences when evaluating plausible patterns of external financing. They argue further that their empirical evidence can evaluate

neither the pecking order nor static trade-off models. Fama and French (2002) use system equations to test for the two models. In line with the predictions of both models, the results show that more profitable firms and firms with fewer investments have higher dividend payouts. In support of the pecking order model, the results show that firms that are more profitable are less levered and short-term variation in investment and earnings is mostly absorbed by debt.

2.4.3 Empirical results on general capital structure themes

Since the pioneering work of Modigliani and Miller (1958), the question of what determines firms' choices of capital structure has been a major field in the corporate finance literature. Since then, numerous studies have attempted to identify those factors that have an effect on firms' choice of capital structure. A previous narrative review conducted by Harris and Raviv (1991) showed that the direction of the relationship between leverage and its determinants across studies shows some inconsistent findings. Accordingly, they conclude that understanding and analysing these mixed results across research studies is filled with difficulty in the capital structure literature. Moreover, cross-study comparisons in traditional literature review are usually undertaken with ignoring any differences in measurement and sample sizes. Wolf (1986), however, suggests that contemporary research reviewing should be more scientific and statistical than it is narrative. One way to do a statistical synthesis technique is employing a meta-analysis procedure. Rosenthal (1991) argues that meta-analysis is a useful methodology in summarizing relationships, determining moderating variables and establishing relationships across studies that are addressing the same research issue. Accordingly, the

meta-analysis technique is used in the next chapter (chapter 3) to determine the significance level of the hypothesised relationship between capital structure and its determinants and investigate the underlying factors that moderate the apparent variation observed in the previous studies. The technique does not appear to have been applied previously within the capital structure literature.

However, before proceeding further it is necessary in the next section to consider prior studies that are very important to the current study as they deal specifically with determinants of capital structure in Saudi Arabia. Since the current study investigates the determinants of capital structure of Saudi unlisted companies, studies relating to capital structure in unlisted sample will be summarised in section

2.4.4 Prior studies related to the context of Saudi Arabia

Our knowledge of capital structure has mostly been derived from a large volume of research conducted in developed countries but very little is known about Arab countries, in particular Saudi Arabia. Following are the studies found in the literature to investigate directly or indirectly the capital structure determinants of listed Saudi Arabian companies.

Omet and Mashharawe (2001) examined the determinants of the capital structure choice of Jordanian, Kuwaiti, Omani and Saudi non-financial listed companies. Pooled ordinary least squares, fixed effects and random effects models were applied using data of 51, 30, 38 and 29 Jordanian, Kuwaiti, Omani and Saudi Arabian companies respectively over the period 1996 to 2001. They found that in general the companies of these countries employ

relatively low leverage ratios. The mean values of long-term debt to total assets were found to be 5.4%, 8%, 13% and 9% for Jordan, Kuwait, Oman and Saudi Arabia respectively. Contrary to tax theory, while Jordanian companies are subject to 35% tax rate, they did not have significantly higher leverage than their counterparts in the other countries that are subject to lower or even zero percent tax rates. In the context of the determinants of capital structure the authors found that the coefficients of profitability and liquidity are significantly negatively in all countries and the coefficients of size are significantly positive in all countries, except for Oman. The coefficients of tangibility, on the other hand, were positively significant only in the case of Jordanian companies.

Barakat and Roa (2004) investigated the influence of tax on the choice of capital structure in 12 tax and non-tax Arab countries (Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia and United Arab Emirates). They employed pooled Tobit regression techniques to estimate their models using the consolidated data of these countries over the period 1996 to 2001. Unlike Omet and Mashharawe's (2001) findings, they found that taxed countries use more debt than non-tax countries. Non-debt tax shields are also found to be *positively* and significantly correlated with leverage in non-tax countries but *negatively* and significantly correlated in tax countries. Further, they found that the coefficients for dividends, family ownership, growth, collateral, size are positive and significant while the coefficients for profitability and earnings volatility are negative and significant. However, the authors failed to find significant relationship between government ownership and leverage.

Although the above papers have begun to explain the Saudi Arabia environment, there is scope to investigate this much more thoroughly. In particular, for listed companies it would be useful to consider how robust the results are to timeframe consideration, alternative model specifications and different variable proxies. Also, little is presently known about capital structure in unlisted companies in Saudi Arabia. The current thesis will address these issues.

2.4.5 Prior empirical studies in the context of small and medium firms

It is quite likely that capital structures of unlisted companies will differ from listed companies since the former cannot gain stock market access. However, a significant gap in the research has been in the determinants of capital structure for unlisted companies, probably due to the lack of data for those companies (Hall et al., 2004). Following are the studies that have been carried out to investigate the determinants of capital structure in the context of small and medium firms.

Petersen and Ragan (1994) conducted a comprehensive investigation about how ties between a firm and its creditors affect the availability and cost of funds to the firm in the context of small firms. In the examination of the firm's debt ratio determinants, a Tobit technique is employed to estimate their model using a sample of 3233 firms over the period 1988 to 1989. They found that firm's size is significantly positively correlated to its total debt ratio. They also found that factors such as profitability, age, length of longest relationship and risk have negative and significant influence on the total debt ratio.

Jordan et al. (1998) investigated the link between capital structure and both competitive and corporate strategies in UK small and medium firms by adopting both questionnaire and regression based analysis[4]. In relation to the corporate strategy, insignificant relationship was found between capital structure and the level of diversification adopted by SME's. However, competitive strategy was found to influence capital structure: innovation strategies differed from cost leadership and differentiation strategies with negative rather than positive correlations with debt levels. Furthermore, inconsistent with trade-off theory, they found that leverage was positively correlated with earnings variability and negatively correlated with effective tax rate. Jordan et al. concluded that the pecking order hypothesis is very important in the determination of capital structure in small firms.

Cassar and Holmes (2003) investigated the influence of size, tangibility, profitability, growth and risk on capital structure for Australian small and medium enterprises using the data of 1555 firms over the period of 1995 to 1998. They found that all debt ratios are significantly positively correlated with size and growth while significantly negatively correlated with profitability. They also found that tangibility is significantly positively correlated with long-term debt and significantly negatively correlated with short-term and total debt ratios. The authors, however, failed to find significant results for risk attribute. They concluded that their results in general provide support for both static trade-off and pecking order hypothesis arguments.

[4] A total of 275 completed questionnaires representing a response rate of 45% and a financial data on 219 small and medium UK firms over the period 1989 to 1993 were used in the analysis.

Esperanca and Gulamhussen (2003) investigated the determinants of capital structure of Portuguese small firms using the data of 995 firms over the period of 1992 to 1996. Consistent with DeAngelo and Masulis's (1980) tax theory, they found that the coefficients of non-debt tax shields are negative and significant in long-term and total debt models but insignificant in short-term model. Consistent with the pecking order hypothesis, they found a negative and significant relationship between profitability and all debt ratios. Size was found to be significantly positively correlated with long-term debt while significantly negatively correlated with short-term and total debt ratios. The authors also found that tangibility is significantly negatively correlated with short-term and total debt ratios and it is significantly positively with long-term debt. This finding in turns supports the asset maturity principle. However, they found that risk and growth variables are significantly positively correlated with short-term and total debt ratios but are insignificantly correlated with long-term debt, while age is significantly negatively correlated only with long-term debt.

Hall, et al. (2004) investigated the differences in capital structure for European small and medium enterprises by examining whether any differences were due to country-specific factors or to differences between countries in firm-specific factors. Short-term debt to total assets and long-term debt to total assets were regressed on a wide set of firm's characteristics using data for 4,000 Small and Medium Enterprises in eight countries (Belgium, German, Spain, Ireland, Italy, Netherlands, Portugal and UK). They found that differences in SME capital structures between countries were due to firm-specific variations not country-specific ones. With regard to determinants of

SME capital structure, they found that while asset structure was consistent across countries and had the expected sign, other variables such as growth, size, profitability and age exhibited different insignificant influence across countries. They argue that since there were variations in the effects of the determinants of capital structure between countries, their hypotheses did not explain everything in term of SME capital structure.

While information about SME capital structure in developed countries is somewhat limited, in developing countries there is virtually no knowledge. The present study seeks to contribute by addressing this issue through an investigation of unlisted companies in Saudi Arabia.

2.5 Conclusion

The history of the theoretical research in capital structure has started with the famous irrelevance theory of Modigliani and Miller (1958). However, by relaxing Modigliani and Miller's assumptions of perfect capital markets, several theoretical frameworks have been developed to explain the firm's capital structure.

Trade off-theory assumes that there are benefits and costs associated with the use of debt as against equity and firms thus chose an optimal capital structure that trade-off between benefits and costs of debt. The theory comes in several forms. The first distinction is that in the beginning the theory was limited to the trade off between the tax advantages of debt against the bankruptcy costs. Then it was extended to include benefits and costs associated with the use of debt in mitigating the conflicts among the agent groups associated with the firm. A second distinction is between the static trade-off model in which a

firm is always at an optimal point, and the dynamic model in which a firm dynamically adjusts its capital structure to a moving target and the adjustment is costly.

Asymmetric information is another dimension of the capital structure theories. It is generally thought there is asymmetric information between firm managers (or insiders) and outside investors. In the pecking order theory, there are three sources of funding available to firms: retained earnings, debt, and equity. Equity is subject to serious adverse selection, debt has only minor adverse selection problems, and retained earnings avoid the problem. Therefore, due to asymmetric information, firms prefer internal over external financing and if external financing is needed debt is preferred over equity. Under this theory, a single target debt ratio does not exist; instead the debt ratio reflects the residual of retained earnings, dividend payout and investment decisions over time. In signalling theory, however, firm's capital structure choice is used as a means to signal to outside investors the information held by insiders.

Finally, models based on industrial organization and corporate control considerations provide explanations of how the characteristics of a firm's inputs/products and firm's control and strategy affect its capital structure.

Although the theories presented in this chapter identified many potential determinants of capital structure, the question of which of these theories best explains capital structure practice remains unanswered.

Seeking to provide an answer to this question, many empirical studies have been carried out concerning the main two theories (i.e. trade-off and pecking

order theories) and using survey and regression methods. The finding of both method show overall mixed results. Table 2.1 and Table 2.2 provide a summary of the main findings of the survey and the regression approaches concerning the two main theories.

Table 2.1: **Studies found support to trade-off theory.**

Survey based studies		Regression based studies			
		Static studies		Dynamic studies	
Study	**Finding**	**Study**	**Finding**	**Study**	**Finding**
Graham& Harvey (01)	37%, 34% and 10% of respondents followed flexible target, somewhat tight target and tight target respectively.	**Taggart (77).**	Movements in the market values of long-term debt offset by movements in the market of equity	**Jalilvand & Harris (84)**	Firm size, interest rate and stock price affect the speed of adjustment.
Brounen et al. (04)	More than two third of the surveyed have some target debt ratio.	**Marsh (82), Hovakimian et al (01), Opler&Titman (94) and Shyam-Sunder and Myers (99)**	Changes in debt demonstrate firm's adjustment toward target debt ratio.	**Fischer et al (89)**	Re-capitalisation costs lead to a wide swing in a firm's debt ratio over time.
Bancel& Mittoo (04)	59 % of managers rank maintaining a target debt-to-equity ratio as important.			**Ozkan (01)**	UK firms adjust to the target ratio relatively fast.
Beattie et al. (06)	51% of the firms surveyed did maintain a target capital structure.			**Gatward & Sharpe (96), DeMiguel & Pindado (01) and Gaud et al. (05)**	Australian, Spain, Swiss firms adjust to the target ratio relatively slow.
				Bhaduri (02)	The costs and the speed of adjustment towards optimal capital structure are higher for short-term debt than for long-term debt.
				Kayhan & Titman (07)	Cash flows, investment expenditures and stock price lead to deviations from target.
				Mayer & Sussman (04)	In the long-term, firms revert to previous levels of leverage.

Table 2.2: **Studies found support to Pecking order hypothesis.**

Survey based studies		**Regression based studies**	
Study	**Finding**	**Study**	**Finding**
Donaldson (61) and Norton (89)	Surveyed firms prefer to use internal to external financing and debt is preferred over equity as external financing.	**Mayers (1989)**	Corporate growth is financed mainly from internal resources and if external finance is needed bank loans were the main source in both market-base and bank-base countries
Allen (91)	52 % of the respondents preferred internal funding sources and 93 % pursue a policy of maintaining spare debt capacity.	**Allen (93)**	Investment growth found negatively correlated with previous dividend levels.
Graham & Harvey (01), Bancel, & Mittoo (04)	Managers view financial flexibility is an important determinant of the company's debt policy.	**Klein and Belt (94)**	Debt being the primary choice for the most efficient firms.
Beattie et al. (06)	60% of the respondents claimed to follow a financing hierarchy.	**Adedeji (98)**	Negative relationship was found between dividend payout and investment. Leverage found positively correlated with dividend payment and negatively correlated with profitability.
		Shyam-Sunder & Myers (99)	Changes in debt ratios are explained by the need for external funds due to the internal financing deficit.
		Fama & French (02)	Firms that are more profitable found to have less leverage. Firms with more investment found to have lower long-term dividend payouts and the short-term variation in investment and earning is mostly absorbed by debt.
		Mayer and Sussman (04)	The pecking orders hold in the short-term in which profitable, large firms issue debt and increase their debt corresponding to their financing requirements.

As it can be seen from the tables, while some studies support the trade-off theory, some others provide support to the pecking order hypothesis and some others show mixed evidence. This would suggest neither of the two theories independently provide sufficient descriptions for the process of how firms chose their debt/equity levels.

The chapter addresses also a brief discussion about the inconsistency of previous empirical results on general capital structure themes. The discussion highlights the importance of studies' measurement differences and sample sizes issues in the cross-study comparisons that are generally ignored in traditional literature review. Since meta-analysis technique has been proven in different areas as useful methodology that considers such issues, it will be used in chapter 3 to summarise and clarify inconsistencies in the cross-study comparisons. The next chapter describes the technique and summarises the findings of prior empirical studies. This chapter ends with a reviewed of the prior empirical studies related to capital structure in the context of Saudi Arabia and in the context of unlisted firms.

Chapter 3: Meta-Analysis Techniques

3.1 Introduction

The vast majority of empirical studies in the capital structure area are concentrated on testing variables that have been suggested by theories to have an influence on debt ratio. One drawback of the previous narrative reviews is that they usually done with the results mostly taken at face value, ignoring any differences in measurement of the explanatory and the dependent variables and studies sample sizes. Harris and Raviv (1991) and Bevan and Danbolt (2002) assert on the importance of measurement differences as a source of variation in the previous finding. In light of this assertion, a meta-analysis technique, which statistically synthesises the finding of previous studies, is used in this dissertation to summarise and clarify inconsistency in the findings of prior studies.

The chapter is presented as follow: section 3.2 presents the meta-analysis technique. Section 3.3 summarises the finding of prior empirical studies. Finally, section 3.4 provides chapter conclusion.

3.2 Meta analysis technique

Glass (1976) describes meta-analysis as a statistical synthesis technique, which integrates the statistical results across individual studies investigating the same research question. Previously, vote counting was the procedure primarily employed for summarising statistical results. In this method, findings are categorised as significantly positive, significantly negative, or insignificant and the category with the most entries is considered the best representation of research in this area. The main drawback of this method is that the process does not take into account the differences between studies in

terms of the statistical significances and sample sizes. Cooper (1998), therefore, concludes that vote counting will produce very imprecise results.

Recently, two common methods of quantitative procedures, namely, the combined significance test and the effect size index are developed to overcome the shortcoming of vote counts. In the combined significance technique, the exact probability associated with the finding of the previous studies is statistically combined to arrive at an overall significance level regarding the research issue of interest. On the other hand, the effect size method involves an accumulation of the correlation coefficients across studies in order to estimate the size of the relationship related to the research issue of interest. Wolf (1986), Greenberg (1992) and Cooper (1998) pointed to the importance of these two meta-analysis techniques in the synthesis of previous findings. Greenberg (1992) argues that when past results conflict or some results are significant and other are not significant, combined significance test can be useful in determining the overall significance level. Moreover, most of the studies included in the sample do not report the statistical data (i.e. Pearson correlation coefficient) required to apply the effect size technique. Accordingly, the combined significance test is applied here.

3.2.1 Combine significance test

The combined significance technique statistically combines the finding of the previous studies that address the same question. The major advantage of this procedure is that it combines the exact probabilities associated with the results of each estimate of a relation to arrive at an overall significance level (Cooper, 1998). Accordingly, it is essential to know or estimate the *P-value* associated

with each of the studies included in the meta-analysis. On the other hand, the major disadvantage of this procedure is that all studies synthesized in a meta-analysis are given equal weight. Wolf (1986) argues that this could lead to the less representative studies with small sample size contributing just as much weight to the results of the meta-analysis as the studies with large sample size. Generally, a study with a large number of observations is more precise, or more reliable, and thus more influential than a study with a small number of observations. Therefore, a large study should have more weight and should contribute proportionately more to the overall results.

To overcome this problem, the combined test should give weights to the studies with larger samples. Cooper (1998), Greenberg (1992) and Wolf (1986) argue that the Stouffer test can be modified to overcome this issue. Generally, this is performed using the degrees of freedom associated with each statistical test as weights in the meta-analysis. Accordingly, the formula for the weighted Stouffer test applied in this dissertation is as follow:

$$\textit{Weighted Stouffer test } (Z_c) = \frac{\sum df\, Z}{\sqrt{\sum df^2}}$$

Where Z is the standard normal deviate associated with the one tailed *P-value* and df is the degree of freedom associated with each statistical test included in the meta-analysis. Then after, the probability associated with Z_c can be obtained from the normal distribution table. The steps to carry out the analysis are as follow:

Each study, which reports a t-test, a Z-test, p-value, or standard error, is included in the meta-analysis.

Tests reporting standard errors are converted to a t-statistic by dividing the coefficient by its standard errors.

The t-statistic is transformed to a p-value using the Excel function (TDIST (t-value), n, 1).

The p-value is transformed to a Z value by using the Excel function (NORMSINV (p-value)).

Table 3.1 illustrates the meta-analysis process used to synthesise the findings of prior empirical studies. The illustration derives from the analysis of size (see Table 3.4, p.70) with just a smaller sub-sample of the data being used.

Error! Reference source not found.**Table 3.1:** Illustrate of meta-analysis applied to size variable using Weighted Stouffer test

Study	Sample size	t-test	p-value	Zc	Df**	Zc*Df	Df^2
Frank & Goyal (03), TD (MV) (Sales)	**82613**	**25.0**	**1.9894E-137**	**24.95**	**82609**	**2061329**	**6824246881**
Bevan & Danpolt*(04), LTD (BV) (Sales)	**6001**	**5.39**	**7.43E-08**	**5.38**	**5997**	**32263.86**	**35964009**
DE JONG A. (02) LTD (BV) (Assets)	**665**	**2.43**	**0.0153624**	**2.42**	**647**	**1568.1474**	**418609**
Akhtar& Oliver (06), TD (MV) (Assets)	**2942**	**7.97**	**2.249E-15**	**7.93**	**2930**	**23225.534**	**8584900**
Heshmati (01), TD (BV) (# of employee)	**6783**	**-4.25**	**2.145E-05**	**-4.24922**	**6763**	**-28722.6**	**45738169**
Mueller E. (05), TD (BV) (# of employee)	**26522**	**15.82**	**4.14352E-56**	**15.78**	**26514**	**418442**	**702992196**
Weighted Stouffer test	$\frac{\sum df\, Z}{\sqrt{\sum df^2}}$					$\sum df^* Z$	$SQRT \sum df^2$
Overall	**=2508105.94 / 87280.84 = 28.74 and p-value= 0.0000**					**2508105.94**	**87280.84**
Sales	**=2093592.86 / 82826.39 = 25.28 and p-value= 0.0000**					**2093592.86**	**82826.39**
Assets	**= 24793.68 / 3000.58 = 8.26 and p-value= 0.0000**					**24793.68**	**3000.58**
# of employee	**=389719.40 / 27362.94 = 14.24 and p-value= 0.0000**					**389719.40**	**27362.94**
Leverage based on MV	**= 2084554.53 /82660.94 = 25.22 and p-value= 0.0000**					**2084554.53**	**82660.94**
Leverage based on BV	**= 423551.41 / 28019.87= 15.12 and p-value= 0.0000**					**423551.41**	**28019.87**
Total debt	**= 2474273.93 / 87072.17= 28.42 and p-value= 0.0000**					**2474273.93**	**87072.17**
Long-term debt	**= 33832.01 / 6031.801 = 5.61 and p-value= 0.0000**					**33832.01**	**6031.8**

* The authors report the standards error, thus, t-test= β / (SE)= 0.0167/0.0031= 5.39
** Degree of freedom (df) = sample size - # of included independent variables in the model.

Moreover, the percentages of the total significant observations to the total number of observations, as well as the percentage of the significant positive and negative observations to the total significant observations, are calculated. Such steps provide information about the driving forces behind the obtained results associated with Z_c in more detail. It is noteworthy that the number of observations rather than the number of studies is used, to maintain the consistency of the results with the results obtained by using the weighted Stouffer test.

3.2.2 Moderating effects

Harris and Raviv (1991) argue that the interpretation of research findings should be tempered by taking into account differences in the measurement of both leverage and the explanatory variables of interest. This means that the relationship between leverage and the corporate characteristics might be moderated by the differences in the measurement of leverage and its determinants. Cooper (1998), Greenberg (1992) and Wolf (1986), amongst others, define a moderating variable as a third variable that causes differences in the association between two other variables. Greenberg (1992) stated that further investigation might reveal a moderating variable masking a relationship. Previous meta-analysis studies suggest sub-grouping studies according to differences in the measurement of the dependent and the independent variables (Ahmed and Courtis 1999). Accordingly, to capture moderator effect, studies are sub-grouped based on the differences in the definition of the debt ratios and in the differences in the proxies used to

measure firm's attributes. Moreover, the weighted Stouffer test is performed for each sub-group.

Bevan and Danbolt (2002) argue that the different financial ratios used in prior literature to measure leverage may cause the determinants of leverage to differ considerably. Since most of the studies measure debt by total or long-term debt, the sub-groupings of debt ratios are according to these definitions. Further, these two debt ratios are usually scaled by either total assets or equity. Total assets are necessarily based on book value recorded in the financial statements. However, equity can be measured either at book value (i.e. shareholders funds in the financial statements) or at market value (as quoted in the stock exchange). Both equity measures have been used in prior studies. Throughout this dissertation, these will be described as debt "based on book value" or "based on market value". These phrases represent an abbreviated from of 'debt scaled by total assets (or equity), measured at book value' and 'debt scaled by total assets (or equity), measured at market value' respectively. Scaling by total assets or equity is not distinguished in this study; this represents a limitation of the analysis.

Titman and Wessels (1988) and Bevan and Danbolt (2002) point out that proxy variables might be selected by the goodness-of-fit criteria and, thus, bias may arise in interpretation of the significance level tests. Consequently, corporate attributes are sub-grouped according to the major differences in the proxies used to capture the effect of these attributes. For example, the attribute of uniqueness is sub-grouped into research & Development (R&D) and selling & administration (S&A) expenses which are usually employed as proxies for

uniqueness. However, either these proxies scaled by sales or assets is not considered in this study for the same reason above. Therefore, this becomes also a limitation inherent in this study.

3.2.3 Data collection procedure

The data collection process went through a systematic method as described below.

3.2.3.1 Determining the research issue and the scope of the literature

The first step in meta-analysis is to determine the research issue to be investigated. It was pointed out earlier in chapter one that though the literature is rich in empirical studies examining the determinants of capital structure, their findings are not always consistent in terms of the direction and strength of the relationship. After determining the research issue, the second step in meta-analysis is to determine the scope of the literature appropriate to examining the research issue. Greenberg (1992) argues that it is important to expand the scope of the search to include more than one area. Accordingly, the literature search was expanded to covers publications in different areas such as accounting, business, economic, finance and management. Commonly, meta-analytic data are obtained only from published research in order to ensure quality (Schmidt, 1985 and Ahmed and Courtis, 1999). However, this has potential to bias the results as it is likely that only significant findings will be published. To reduce this bias, the literature search included working papers as well as published studies in journals.

3.2.3.2 Searching process

Before the search process began, it was essential to set up an empty database that will include the references of the studies under investigation. Utilizing the reference manager application provided by the university, an empty reference manager database was established. The next step is to search studies for review and transform their references into the database. A combination of manual scanning of the previous studies' references and on-line searching of the related websites such as Blackwell Synergy, Business Source Elite, Econlit, Emerald, IngentaConnect, JSTOR and Science Direct (for published studies) and Social Science Research Network (SSRN) and Google (for working papers) was carried out. Since all of these websites other than Google provide an option to export references electronically to the reference manager database, most of the references were transformed into the database electronically and some references were entered manually.

3.2.3.3 Sample selection

The reference manager database reveals that the above search process produced an initial sample of 403 studies' references related to capital structure subjects. However, it is most likely that this process involve a repetition issue (i.e. one study's reference were entered into the database more than once). Indeed, utilising the check for duplicates function provided by reference manager showed that 47 references were duplicated. Moreover, 79 Non-empirical studies are excluded from the meta-analysis. Similarly excluded are 12 empirical studies based on survey method and 2 case studies. Also, excluded are 14 non-English language studies.

The reduced sample, thus, limited to studies based on regression analysis. These studies employed different estimation techniques such as time-series, cross-sectional, pooled and Panel data regressions. However, estimation techniques are not distinguished in this study although prior empirical studies assert on the importance of the estimation differences as a source of inconsistency (Bevan and Danbolt, 2004). Therefore, this becomes also a limitation inherent in this study and represents a potential expansion for this analysis.

Including the regression-based studies in the meta-analysis review required further the presence of: (1) a dependent variable measuring debt ratios and (2) explanatory variables. The dependent variables include total debt and long-term debt scaled by either total assets or total equity and defined by book or market value. The explanatory variables include attributes widely-used to investigate the capital structure determinates. These include size, tangibility, profitability, risk, tax, growth, uniqueness, dividend, free cash flow, liquidity, age and government ownership. Some studies (24) did not relate to capital structure determinants at all, but had leverage as one of a number of explanatory variables, so these studies were picked up in key word (leverage) searches. A further 39 studies (including some from management, economic and accounting) were identified of a similar nature, but where leverage was not even included as an explanatory variable. Excluded are 29 studies which did not report the required statistical data. Also, excluded are 17 studies investigating only a particular capital structure aspect or, for example, banks capital structure (Yu, 2000), incremental capital structure decisions (De Jong and Veld, 2001) and event study (Givoly, 1992).

Accordingly, the final sample of 140 [*see footnote 6 next page*] related studies was included in the analysis of which 105 published studies were obtained from 46 journals and 35 working papers were obtained mainly from SSRN and a few from Google websites[5]. Table in Appendix 1 summarises these studies by author name, year, data source, country and years covered in the study.

Table 3.2 summarises the sample selection process.

[5] Some of these studies involve cross-countries analysis. Since countries' samples are drawn from different population, each country is considered as individual study.

Table 3.2: **Summary of number of papers included in meta-analysis study and reasons for paper exclusion**

	No	No
Initial identification of possible capital structure papers		403
Reasons for exclusion from meta-analysis study		
Duplicated papers	48	
Non-empirical studies	79	
Survey studies	12	
Case studies	2	
Specific investigations rather than general capital structure determinants	17	
(eg study of banks, incremental capital structure decisions; event studies		
Leverage as explanatory variable in non-capital structure studies	24	

Other non-capital structure studies but leverage not even as explanatory variable	39	
Total excluded because different methods applied		(221)
Non-English language studies	14	
Insufficient statistical measures reported in paper for meta-analysis	29	(43)
Total number of papers included in meta-analysis study [6]		139
Published papers		102
Working papers		37
Total number of papers included in meta-analysis study [6]		139

3.3 Results

The discussion, here, is according to the main attributes discussed earlier, which are assumed theoretically to determine capital structure. First, an aggregate meta-analysis is conducted. Next, the main sample is disaggregated

[6] After completion of the dissertation, it was identified that the number of papers used in the meta-analysis actually 139 rather than the 140 reported elsewhere in the dissertation.

based on proxies used in prior studies to capture attribute effect and based on debt's measurement and definition. An independent meta-analysis is further carried out for each sample. Tables 3-2 to Table 3.16 summarise the results of meta-analysis of the relationship between debt levels and these variables. Table 3.3 provides guidelines for the format of results presentation for each panel of the tables. In the results tables, the column labelled W.S.T is the p-value (and sign) of the Weighted Stouffer Test.

Table 3.3: **Format of results presentation for each panel of the tables**

Row	Proxy	Shading	Font	Dependent variables
1	Proxy name	Un-shaded	Normal	Total debt based on book value
2		Un-shaded	*Italic*	Long-term debt based on book value
3		Shaded	Normal	Total debt based on market value
4		Shaded	*Italic*	Long-term debt based on market value
5		Un-shaded	***Bold italic***	Summary of aggregated results for the particular proxy across both dependent variables and book value and market value measures
Last row		Un-shaded	**Bold normal**	Summary of aggregated results across all proxies and all measures

3.3.1 Size

Theoretically, the impact of size on debt levels is positive. Empirically, the total asset, the total sales, or the number of employees typically measures firm's size. These proxies are usually transformed to the natural logarithm of the raw data in order to improve the linear relationship with debt ratios.

The overall percentage of significance demonstrates that a strong relationship exists between size and leverage. Consistent with the theory, the weighted Stouffer test further shows that the overall direction of this relation appears to be significantly positive. Table 3.4 (final row) shows that 92.61% of the total observations are significant of which 96.39% are positive and significant at 1% level.

Table 3.4: **Meta-analysis results of Size attribute.**

M.V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Assets	78	1012363	962333	95.06	941552	97.84	20781	2.16	0.0000	P
	59	*120455*	*69939*	*58.06*	*52416*	*74.95*	*17523*	*25.05*	*0.0000*	*P*
	83	736585	714594	97.01	713862	99.90	732	0.10	0.0000	P
	46	*145793*	*137935*	*94.61*	*137935*	*100*	*0*	*0.00*	*0.0000*	*P*
	266	***2015196***	***1884801***	***93.53***	***1845765***	***97.93***	***39036***	***2.07***	***0.0000***	***P***
Sales	40	217355	211282	97.21	211282	100	0	0.00	0.0000	P
	52	*27506*	*24456*	*88.91*	*17987*	*73.55*	*6469*	*26.45*	*0.0000*	*P*
	72	414332	362533	87.50	354619	97.82	7914	2.18	0.0000	P
	46	*14005*	*10577*	*75.52*	*10577*	*100*	*0*	*0.00*	*0.0000*	*P*
	210	***673198***	***608848***	***90.44***	***594465***	***97.64***	***14383***	***2.36***	***0.0000***	***P***
# Employees	***12***	***109483***	***97549***	***89.10***	***57324***	***58.76***	***40225***	***41.24***	***0.0429***	***P***
Market	***247***	***1310715***	***1225639***	***93.51***	***1216993***	***99.29***	***8646***	***0.71***	**0.0000**	***P***
Book	***241***	***1487162***	**1365559**	***91.82***	***1280561***	***93.78***	***84998***	***6.22***	***0.0000***	***P***
TD	***297***	***2599601***	**2445840**	***94.09***	***2335963***	***95.51***	***109877***	***4.49***	***0.0000***	***P***
LTD	***203***	***307759***	**242907**	***78.93***	***218915***	***90.12***	***23992***	***9.88***	***0.0000***	***P***
Overall	**488**	**2797877**	***2591198***	**92.61**	**2497554**	**96.39**	**93644**	**3.61**	**0.0000**	**P**

M.V., Obs., W.S.T., and Dir. refer to moderating variables, observations, Weighted Stouffer Test and direction of the relationship.

Further analysis suggests that differences in size measurement moderate the results, as hypothesised. The meta- analysis results suggest that studies using total assets and total sales have higher significant levels (significant at the 1% level) than studies using the number of employees (significant at the 5% level) in explaining the positive relationship between size and debt levels. A careful

study of the table indicates that the split in the significant results between positive and negative direction in the number of employees proxy lessen the strength of this relationship. The other two hypothesised moderator variables (i.e. measurement and definition of debt ratios) show slight differences in the percentage of the significant observations though the meta-analysis results are significant at the 1% level.

The result show that studies using debt based on market value compared to those using debt based on book value have more power in explaining hypothesised positive relationship between size and debt with 99.29% compared to 93.78% as a percentage of the total significant results. It is also observed that studies using total debt ratio compared to those using long-term debt ratio have more power in explaining hypothesised positive relationship with 95.51% compared to 90.12% as a percentage of the total significant results. However, the observed relationship between long-term debt defined by book value and assets proxy (row 2) appears to drive the observed differences in the results. In this relationship, only 58.06% of the total observations are significant of which 74.95% of the significant observations are positive and 25.05% are negative. However, this result worth to be discussed in more details, as it is demonstrates the advantage of using weighted Stouffer procedure. It is important to note that weighted Stouffer test reveals strong significant level (1%) though 58.06% of the total observations are significant. The observed highly significant results arise due to the majority of the studies (i.e. 46 studies with total 84138 observations), which in turn constitutes about 70% of the total sample observations, show positive

direction regardless to significant level[7]. To avoid biasness toward significant results, weighted Stouffer procedure includes both significant and insignificant results in the calculation process to draw an overall relationship and, thus the observed result is not surprising.

In sum, the overall and the moderator variables support the theoretical hypothesised positive relationship between size and debt levels as the weighted Stouffer procedures produce significant positive relationships for all samples.

3.3.2 Tangibility

Generally, tangibility is defined as the ratio of fixed assets to total assets. The overall percentage of significance demonstrates that a moderate relationship exists between tangibility and leverage. However, weighted Stouffer test shows that the overall direction of this relation is significantly positive. Table 3.5 (final row) shows that 79.76% of the total results are significant of which 94.33% are positive and significant at 1% level under weighted Stouffer test.

Table 3.5: **Meta-analysis results of Tangibility attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
F.A./T.A.	78	1212517	786886	64.90	709875	90.21	77011	9.79	0.0000	P
	59	*147802*	112886	*76.38*	*110082*	*97.52*	*2804*	*2.48*	*0.0000*	*P*
	83	1053707	1005647	95.44	969573	96.41	36074	3.59	0.0000	P
	46	*148755*	138729	*93.26*	*138693*	*99.97*	*36*	*0.03*	0.0000	*P*
	266	***2562781***	***2044148***	***79.76***	***1928223***	***94.33***	***115925***	***5.67***	***0.0000***	***P***
Market	***129***	***1202462***	***1144376***	***95.17***	***1108266***	***96.84***	***36110***	***3.16***	***0.0000***	***P***
Book	***137***	***1360319***	***899772***	***66.14***	***819957***	***91.13***	***79815***	***8.87***	***0.0000***	***P***
TD	***161***	***2266224***	***1792533***	***79.10***	***1679448***	***93.69***	***113085***	***6.31***	***0.0000***	***P***
LTD	***105***	***296557***	***251615***	***84.85***	***248775***	***98.87***	***2840***	***1.13***	***0.0000***	***P***
Overall	**266**	**2562781**	**2044148**	**79.76**	**1928223**	**94.33**	**115925**	**5.67**	**0.0000**	**P**

[7] Not reported due to table's space limitation.

Further, the results suggest that the measures and the definitions of debt ratio used in the studies have a moderating effect on tangibility and leverage relationship. As observed in size, it seems that studies using debt based on market value compared to those using debt based on book value have more power in explaining the hypothesised positive relationship between tangibility and debt. The debt based on market value with 95.17% of the total results are significant of which 96.84% are positive compared to 66.14% and 91.13% respectively observed in the debt based on book value.

Contrary to observed in size, studies using long-term debt ratio compared to those using total debt ratio have more power in explaining the hypothesised positive relationship with 98.87% compared to 93.69% as a percentage of the total significant results. However, this is not surprising as long-term debt is usually secured against fixed assets. It seems that the differences in the results are driven by the observed relationship between total (row 1) and long-term debt (row 2) defined by book value and tangibility ratio as they show the lowest percentage of overall significant results with 64.90% and 76.38% respectively. Nevertheless, weighted Stouffer test show that all results are significant at 1% level though variation in term of percentage is observed.

This leads one to conclude that the overall and the moderator variables support the positive relationship between tangibility and debt levels. This in turn lends strong support to Jensen and Meckling's (1976) argument that firms with high level of fixed assets would have higher level of debt as fixed assets improved guarantee of repayment to the lenders but contradict the tax-based hypothesis of DeAngelo and Masulis (1980) that suggests negative influence.

3.3.3 Profitability

It has been seen earlier that there are no consistent theoretical predictions on the influence of profitability on firm's capital structure. Generally, earnings before interest, tax, and depreciation (EBITD) scaled by either total assets (Return on Assets: ROA) or by total sales (Return on Sales: ROS) are used to capture the effect of profitability on leverage ratios.

The overall percentage of significance demonstrates that a strong relationship exists between profitability and leverage. Consistent with pecking order hypothesis, weighted Stouffer test further shows that the overall direction of this relation is significantly negative. Table 3.6 (final row) shows that 85.64% of the total results are significant of which 99.81% is negative and only 0.19% are positive. Moreover, the results of the weighted Stouffer test produce significance negative association between debt ratio and the profitability attribute at the 1% level in all samples. The observed negative relationship, however, varies due to the influence of the suggested moderator variables.

Table 3.6: **Meta-analysis results of Profitability attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
ROA	123	1301973	936620	71.94	0	0.00	936620	100.0	-0.0000	N
	109	*146070*	*130703*	*89.48*	*2202*	*1.68*	*128501*	*98.32*	*-0.0000*	*N*
	141	1154492	1134145	98.24	0	0.00	1134145	100.0	-0.0000	N
	76	*143736*	*136879*	*95.23*	*0*	*0.00*	*136879*	*100.0*	*-0.0000*	*N*
	449	***2746271***	***2338347***	***85.15***	***2202***	***0.09***	***2336145***	***99.91***	***-0.0000***	***N***
ROS	3	2369	1233	52.05	0	0.00	1233	100	-0.0034	N
	3	*2280*	*1136*	*49.82*	*0*	*0.00*	*1136*	*100*	*-0.0001*	*N*
	50	136108	131381	96.53	2602	1.98	128779	98.02	-0.0000	N
	6	*5500*	*5179*	*94.16*	*0*	*0.00*	*5179*	*100*	*-0.0000*	*N*
	62	***146257***	***138929***	***94.99***	***2602***	***1.87***	***136327***	***98.13***	***-0.0000***	***N***
Market	***273***	***1439836***	***1407584***	***97.76***	***2602***	***0.18***	***1404982***	***99.82***	***-0.0000***	***N***
Book	***238***	***1452692***	***1069692***	***73.64***	***2202***	***0.21***	***1067490***	***99.79***	***-0.0000***	***N***
TD	***317***	***2594942***	***2203379***	***84.91***	***2602***	***0.12***	***2200777***	***99.88***	***-0.0000***	***N***
LTD	***194***	***297586***	***273897***	***92.04***	***2202***	***0.80***	***271695***	***99.20***	***-0.0000***	***N***
Overall	**511**	**2892528**	**2477276**	**85.64**	**4804**	**0.19**	**2472472**	**99.81**	**-0.0000**	**N**

In general, the results show that the ROS as a proxy for profitability has relatively more explanatory power than the ROA in capturing the effect of this relationship. Also, when debt is classified into market and book values, it seems that studies using debt based on market value compared to those using debt based on book value have more power in explaining the hypothesised negative relationship between profitability and debt. Moreover, studies using total debt ratio compared to those using long-term debt ratio have more power in explaining the hypothesised negative relationship between profitability and debt.

It is noteworthy that though the lowest percentage of the significant results is observed between the debts levels defined by book value and the ROS proxy

(about half), the weighted Stouffer test still produces a significant negative relationship at 1% level of significance. For total debt (row 6), the observed highly significant result is due to two of the three studies with sample sizes of 558 and 675 observations showing significant negative relationship with Z values (–3.28) and (-4.77) respectively. The third study, with sample size of 1136, shows an insignificant positive relationship with Z value (1.02). Since the weighted Stouffer procedure includes associated Z values in the calculation process, multiplying the Z value by the degree of freedom associated with each study produce overall negative results and highly significant (-0.0034). In the long-term debt ratio (row 7), however, the observed highly significant results seems to be driven by the results of all the three studies included in the sample as they all show negative direction. However, the study with the largest sample (1136 observations) is found highly significant with Z value (-3.29) and the other two studies with samples of (469 and 675 observations) are insignificant with Z values (-0.90 and –1.42 respectively).

In summary, consistent with the pecking order hypothesis, both the overall and the moderator variables results reveal that profitability has strong negative influence on leverage. This in turn provides strong support to the pecking order hypothesis but contradicts trade off theory.

3.3.4 Risk

The theoretical literature suggests an inverse relationship between debt ratios and risk. To capture the influence of risk on debt levels, most empirical studies use firm's earnings volatility but a few uses the systematic risk of the

firms (β). Table 3.7 (final row) shows that 67.08% of the total results are significant of which 85.27% is negative and significant at 1%. This suggests that the overall relationship between risk and debt levels seems to be a moderate negative relationship but the weighted Stouffer test shows that the overall direction of this relation is significantly negative.

Table 3.7: **Meta-analysis results of risk attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Earnings Volatility	54	217096	125812	57.95	11734	9.33	114078	90.67	-0.0000	N
	85	*48829*	*17624*	*36.09*	*7158*	*40.62*	*10466*	*59.38*	*-0.0254*	*N*
	36	296709	235248	79.29	37453	15.92	197795	84.08	-0.0000	N
	78	*35064*	*18986*	*54.15*	*3035*	*15.99*	*15951*	*84.01*	*-0.0000*	*N*
	253	***597698***	***397670***	***66.53***	***59380***	***14.93***	***338290***	***85.07***	***-0.0000***	***N***
β	3	2177	1932	88.75	0	0.00	1932	100	-0.0000	N
	3	*2560*	*1449*	*56.60*	*0*	*0.00*	*1449*	*100.00*	-0.0001	*N*
	2	2691	2691	100	0	0.00	2691	100.00	-0.0000	N
	2	*6654*	*6654*	*100*	*1056*	*15.87*	*5598*	*84.13*	-0.0000	*N*
	10	***14082***	***12726***	***90.37***	***1056***	***8.30***	***11670***	***91.70***	***-0.0000***	***N***
Market	***118***	***341118***	***263579***	***77.27***	***41544***	***15.76***	***222035***	***84.24***	***-0.0000***	***N***
Book	*145*	***270662***	***146817***	***54.24***	***18892***	***12.87***	***127925***	***87.13***	***-0.0000***	***N***
TD	***95***	***518673***	***365683***	***70.50***	***49187***	***13.45***	***316496***	***86.55***	***-0.0000***	***N***
LTD	***168***	***93107***	***44713***	***48.02***	***11249***	***25.16***	***33464***	***74.84***	***-0.0000***	***N***
Overall	**262**	**611780**	**410396**	**67.08**	**60436**	**14.73**	**349960**	**85.27**	**-0.0000**	**N**

It seems that the relatively low percentage of significant results observed in earnings volatility proxies (66.53%) reduce the overall explanatory power of risk attribute. However, conclusion about the low percentage of significance results observed in this proxy is ambiguous. The table shows that the influence of the moderator variables is very strong in this particular relationship. While only 10 studies employed firm's β as a proxy for risk, the explanatory power of this proxy in capturing the influence of risk on leverage is apparently higher than earnings variability proxy.

Moreover, though both of them have high weighted Stouffer test significant level (1%), the results show that debt based on book value (row 12) with 87.13% percentage of significance and total debt ratio (row 13) with 86.55% percentage of significance has more power in explaining the hypothesised negative relationship than debt based on market value (row 11) with 84.24% and long-term debt ratio (row 14) with 74.84% respectively. Apparently, these results are mainly driven by the results of total debt ratio based on book value in earnings variability proxy. The percentage of significance observed in long-term debt ratio based on book value in earnings variability proxy (row 2) with only 36.09% also seem to drive overall of the percentage of significance (48.02%) of long-term debt ratio (row 14).

As observed in assets proxy as measure of size, it seems the observed moderate significant weighted Stouffer test (0.0245) that is associated with low percentage of significance (36.09%) in long-term debt ratio based on book value is driven by that more than half of the studies (i.e. 49 studies with total 30347 observations), which in turn constitutes about 60% of the total sample observations, show negative direction regardless to significant level.

In summary, consistent with theory, the weighted Stouffer tests show that risk is significantly inversely correlated with debt ratios. However, it is found that the strength of this inverse relationship is varying among the hypothesised moderator variables in which firm's (β) as proxy for risk has the highest power in explaining this relationship.

3.3.5 Tax

Since there are two main arguments regarding tax issue, the finding of previous work associated with each argument is investigated separately.

3.3.5.1 Effective tax rate

Theoretically, a positive relationship between effective tax rate and debt ratio is expected due to interest deductibility. Generally, the effective tax rate (tax charge / profit before tax) is used to capture this relationship. The overall percentage of significance demonstrates that the relationship between tax rate and debt levels seems to be an undetermined relationship mainly due to the split in the significant results between the positive and the negative direction as will as the relatively high percentage of insignificant results observed. Moreover, weighted Stouffer test show that the overall direction of this relation is positive but insignificant. **Error! Reference source not found.** (final row) shows that 66.33% of the total observations are significant of which is 45.22% positive and 54.78% is negative. This result combined with associated insignificant meta-analysis results provides support to Graham et al (1998) argument that corporate tax is endogenous to financing decisions, which induce a spurious association between debt ratios and MTR. According to Graham et al's argument, studies that found positive relationship suggests that these studies use after financing ' marginal tax rate while studies that found negative relationship suggests that these studies include the interest expense in the marginal tax rate computation.

Table 3.8: **Meta-analysis results of Effective tax rate.**

M.V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Effective Tax rate	38	**343629**	244917	71.27	18706	7.64	226211	92.36	-0.0000	N
	68	*102610*	*58049*	*56.57*	*3049*	*5.25*	*55000*	*94.75*	*-0.0000*	N
	23	307009	224682	73.18	214851	95.62	9831	4.37	0.0000	P
	61	*64094*	*14704*	*22.94*	*8662*	*58.91*	*6042*	*41.09*	*0.2494*	*Ins. P*
	190	***817342***	***542352***	***66.33***	***245268***	***45.22***	***297084***	***54.78***	***0.4951***	***Ins. P***
Market	***84***	***371103***	***239386***	***64.51***	***223513***	***93.37***	***15873***	***6.63***	**0.0000**	***P***
Book	***106***	***446239***	***302966***	***67.89***	***21755***	***7.18***	***281211***	***92.82***	***-0.0000***	***N***
TD	***61***	***650638***	***469599***	***72.18***	***233557***	***49.74***	***236042***	***50.26***	**0.1495**	**Ins. P**
LTD	***129***	***166704***	***72753***	***43.64***	***11711***	***16.10***	***61042***	***83.90***	***-0.0000***	***N***
Overall	**190**	**817342**	**542352**	**66.33**	**245268**	**45.22**	**297084**	**54.78**	**0.4951**	**Ins. P**

The moderator variables also show conflicting results. The suggested positive relationship is only found significantly with debt based on market value and insignificantly with total debt. On the other hand, the debt based on book value and long-term debt results both show significantly an inverse relationship.

In summary, both the weighted Stouffer tests and the percentage of significance of overall and the moderator variables results show insignificant and conflicting results. These, in turn, raise the concern about the importance of the tax benefits of debt as determinant of capital structure.

3.3.6 NDTS

Theoretically, non-debt tax shields substitute for the tax benefits of debt and, thus, an inverse relationship is expected between NDTS and leverage. Empirically, the overall association between NDTS and leverage seems to be a moderate negative relationship. Table 3.9 (final row) shows that about

86.71% of the total results are significant of which is 75.71% negative and 24.29% is positive. Moreover, the weighted Stouffer test shows that the overall direction of this relation is significantly negative.

Table 3.9**: Meta-analysis results of NDTS.**

M.V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
NDTS	46	360453	285922	79.32	175832	61.50	110090	38.50	0.0146	P
	28	*47627*	*39037*	*81.96*	*2032*	*5.21*	*37005*	*94.79*	*-0.0000*	*N*
	38	438305	405542	92.53	20251	4.99	385291	92.53	-0.0000	N
	38	*141250*	*125907*	*89.14*	*9942*	*7.90*	*115965*	*92.10*	*-0.0000*	N
	150	***987635***	***856408***	***86.71***	***208057***	***24.29***	***648351***	***75.71***	***-0.0000***	***N***
Market	***76***	***579555***	***531449***	***91.70***	***30193***	***5.68***	***501256***	***94.32***	***-0.0000***	***N***
Book	***74***	***408080***	***324959***	***79.63***	***177864***	***54.73***	***147095***	***45.27***	***0.2474***	***Ins. P***
TD	***84***	***798758***	***691464***	***86.57***	***196083***	***28.36***	***495381***	***71.64***	***-0.0000***	***N***
LTD	***66***	***188877***	***164944***	***87.33***	***11974***	***7.26***	***152970***	***92.74***	***-0.0000***	**N**
Overall	**150**	**987635**	**856408**	**86.71**	**208057**	**24.29**	**648351**	**75.71**	**-0.0000**	**N**

The moderator variables, however, show conflicting results, in particular, the debt's based value definition. While the suggested negative relationship is significantly observed with market based-value debt (row 6), an insignificant positive relationship is found when debt is defined based on book value (row 7). This results is mainly driven by the significant positive relationship exists between NDTS and book based total debt. On the other hand, the second

moderator variable results, measurement of debt ratio, show that both total debt and long-term have significant negative association with NDTS.

In summary, the overall results of weighted Stouffer tests reveal that NDTS is significantly negatively correlated with debt ratio. However, driven by the variation and sometimes conflicting results observed in the hypothesised moderating variables, the percentage of significance results show that the strength of this relationship is moderate negative.

3.3.7 Growth

Both the trade-off and the pecking order hypothesis suggest a negative relationship between growth and debt. Commonly, the market to book ratio is used to proxy for growth opportunities. To a lesser extent, growth in sales and growth in assets are also used to capture the effect of growth on leverage. However, as observed in earnings volatility, the time period used in these two proxies to capture the effect of growth vary among studies included in the sample, which is not considered here. Accordingly, the conflicting results obtained by these proxies also should be interpreted with caution.

Consistent with agency theory, the overall association between growth and leverage seems to be strong negative relationship. Table 3.10 (final row) shows that about 80% of the total results are significant of which is 92.82% negative and 7.18% is positive. Moreover, weighted Stouffer test show that the overall direction of this relation is significantly negative. However, the result suggests that the type of proxy used has a moderating effect on growth and leverage relationship. Indeed, the overall results of the relationship between market-to-book ratio and debt (row 15) show strong significant

negative relationship. However, the variation in the strength of this negative relationship is observed among the hypothesised moderating variables in which the relationship is found negative but insignificant in book-based long-term debt. The split in the significant results between positive and negative directions seems to be the reason of obtaining insignificant weighted Stouffer test.

Table 3.10: **Meta-analysis results of growth attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Sales	34	128742	47121	36.60	30808	65.38	16313	34.62	0.0262	P
	25	*45475*	*11753*	*25.84*	*10268*	*87.36*	*1485*	*12.64*	*0.0000*	*P*
	3	1563	951	60.84	764	80.34	187	19.66	0.0006	P
	1	5598	5598	*100*	0	*0.00*	5598	*100.00*	Na	*N*
	63	***181378***	***65423***	***36.07***	***41840***	***63.95***	***23583***	***36.05***	***0.0001***	***P***
Assets	20	58836	46068	78.30	13546	29.40	32522	70.60	-0.0019	N
	15	*15600*	*8564*	*54.90*	*7889*	*92.12*	*675*	*7.88*	*0.0000*	*P*
	15	20964	12631	60.25	3009	23.82	9622	76.18	-0.0432	N
	10	7032	5632	80.09	3443	*61.13*	2189	*38.87*	*0.0768*	*P*
	60	***102432***	***72895***	***71.16***	***27887***	***38.26***	***45008***	***61.74***	***-0.0000***	***N***
M/B	72	733660	610793	83.25	52848	8.65	557945	91.35	-0.0000	N
	71	*70675*	*23497*	*33.25*	*11008*	*46.85*	*12489*	*53.15*	*-0.3246*	Ins. N
	133	1088911	961268	88.28	0	0.00	961268	100	-0.0000	N
	74	*140358*	*127208*	*90.63*	*0*	*0.00*	*127208*	*100*	*-0.0000*	N
	350	***2033604***	***1722766***	***84.71***	***63856***	***3.71***	***1658910***	***96.29***	***-0.0000***	***N***
Market	***236***	***1264426***	***1113288***	***88.05***	***7216***	***0.65***	***1106072***	***99.35***	***-0.0000***	**N**
Book	***237***	***1052988***	***7477778***	***71.01***	***126367***	***16.90***	***621429***	***83.10***	***-0.0000***	***N***
TD	***277***	***2032676***	***1678832***	***82.59***	***100975***	***6.01***	***1577857***	***93.99***	***-0.0000***	***N***
LTD	***196***	***284738***	***182234***	***64.00***	***32608***	***17.89***	***149644***	***82.12***	***-0.0352***	***N***
Overall	**473**	**2317414**	**1861066**	**80.31**	**133583**	**7.18**	**1727501**	**92.82**	**-0.0000**	**N**

For growth in assets and growth in sales proxies, the table shows conflicting results. It is found that growth in assets (row 10) demonstrates overall

moderate percentage of significance (71.16%) with relatively weak negative percentage of significance (61.74%) relationship but high significant weighted Stouffer test (1%). The significant positive relationship observed with long-term debt ratios, which contradict the negative association between growth and long term-debt hypothesised by agency theory, appears to be the reason of observing such semi weak negative results. On the other hand, it is found that growth in sales (row 5) demonstrates a relatively weak positive percentage of significance (63.97%) and significant weighted Stouffer test at 1% level though overall very weak percentage of significance (36.06%) relationship is observed. It seems the observed high significant weighted Stouffer test (0.0001) that is associated with low percentage of significance (36.06%) in overall relationship between growth in sales and debt is driven by that more than half of the studies (i.e. 36 studies with total 130009 observations), which in turn constitutes about 72% of the total sample observations, show positive direction regardless to significant level.

Moreover, the other suggested moderator variables provide support to the hypothesised inverse relationship but with variation in strength of which the explanatory power of market based-value debt is better than of book based-value debt and total debt is out perform long-term debt. Clearly, these findings are mainly driven by the significant positive relationship observed in the growth of sales and assets and to less extent by the insignificant negative relationship found between book-based long-term debt and market-to-book ratio.

In summary, overall relationship reveals a strong negative relationship exists between growth and leverage, which is consistent with the prediction of agency theory. However, the differences in growth proxies used seem to have a moderating effect on this relationship in which conflicting results among these proxies were observed. The other moderator variables, on the other hand, show constantly the expected negative relationship but with variation in the strength.

3.3.8 Uniqueness

According to Titman's (1984) argument, firms producing unique products would use less debt. Generally, Research & Development (R&D) and Selling & Administration (S&A) expenses are used as proxies for uniqueness. Empirically, the overall percentage of significance demonstrates that a strong relationship exists between uniqueness and leverage. Table 3.11 (final row) shows that weighted Stouffer test show the overall direction of this relation is significantly negative which is consistent with the prediction of Titman's arguments.

Table 3.11: **Meta-analysis results of uniqueness attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
R&D	27	390417	368812	94.47	10800	2.93	358012	97.07	-0.0000	N
	14	*24676*	*14449*	*58.55*	*10800*	*74.75*	*3649*	*25.25*	*0.0280*	*P*
	9	339575	339349	99.93	0	0.00	339349	100.0	-0.0000	N
	16	*123687*	*118900*	*96.13*	*968*	*0.81*	*117932*	*99.19*	*-0.0000*	N
	66	***878355***	***841510***	***95.81***	***22568***	***2.68***	***818942***	***97.32***	***-0.0000***	***N***
S&A Exp.	8	342963	314065	91.57	1747	0.56	312318	99.44	-0.0000	N
	6	*7082*	*7082*	*100*	*3075*	*43.42*	*4007*	*56.58*	*-0.0895*	N
	14	365219	362397	99.23	1021	0.28	361376	99.72	-0.0000	N
	Na	*Na*	*Na*	*Na*	*Na*	Na	*Na*	*Na*	*Na*	*Na*
	28	***715264***	***683544***	***95.57***	***5843***	***0.85***	***677701***	***99.15***	**-0.0000**	***N***
Market	***39***	***828481***	***820646***	***99.05***	***1989***	***0.24***	***818657***	***99.76***	**-0.0000**	N
Book	***55***	***765138***	**704408**	***92.06***	***26422***	***3.75***	***677986***	***96.25***	**-0.0000**	***N***
TD	***58***	***1438174***	**1384623**	***96.28***	***13568***	***0.98***	***1371055***	***99.02***	**-0.0000**	***N***
LTD	***36***	***155445***	**140431**	***90.34***	***14843***	***10.57***	***125588***	***89.43***	**-0.0000**	***N***
Overall	**94**	**1593619**	**1525054**	**95.70**	**28411**	**1.86**	**1496643**	**98.14**	**-0.0000**	**N**

The moderator variables results also provide support to the negative influence of uniqueness on leverage though both significant positive and weak significant negative relationship are observed in the relationship of book based-value long-term debt with R&D and S&A proxies respectively.

It is noteworthy these results also provide support to the hypothesised negative relationship between debt and both NDTS and growth opportunities attributes that are discussed earlier. On one hand, the above observed negative relationship is consistent with NDTS argument since R&D and S&A are considered other tax shields like depreciation. On the other hand, if R&D and S&A are considered as intangible assets that add value to the firm but cannot be collateralised, then the above negative relationship is also lending support to growth opportunities argument.

In summary, both the overall and the moderator variables results reveal that uniqueness has a strong negative influence on leverage, which is consistent with Titman's (1984) argument. Moreover, this finding also lends support to the hypothesised negative relationship between debt and both NDTS and growth opportunities attributes.

3.3.9 Dividend

There is no consistent theoretical prediction on the influence of dividends on firm's capital structure. Dividend payout and to less extent dividend yield are used in prior studies to capture the impact of dividends on the firm's capital structure. The overall percentage of significance demonstrates that a strong relationship exists between dividends and leverage. However, contradictory to

the prediction of pecking order hypothesis, weighted Stouffer test show the overall direction of this relation is significantly negative. Table 3.12 (final row) shows that about 98% of the total results are significant of which is 93.13% negative and 6.87% is positive.

Table 3.12: **Meta-analysis results of dividends attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Dividends payout	18	382822	379306	99.08	45175	11.91	334131	88.09	-0.0000	N
	10	*15992*	*14265*	*89.20*	371	*2.60*	*13894*	*97.40*	*-0.0000*	N
	11	368068	364559	99.05	1243	0.34	363316	99.66	-0.0000	N
	6	*14255*	*9196*	*64.51*	*2490*	*27.08*	*6706*	*72.92*	-0.0006	N
	45	***781137***	***767326***	***98.23***	***49279***	***6.42***	***718047***	***93.58***	***-0.0000***	*N*
Dividends yield	1	245	245	100	245	100	0	0.00	Na	P
	1	*55*	*55*	*100*	*0*	*0.00*	*55*	*100*	Na	*N*
	Na	Na	Na	Na	Na	Na	Na	Na	Na	Na
	6	*7128*	*3476*	*48.77*	*3476*	*100*	*0*	*0.00*	0.0000	*P*
	8	***7428***	***3776***	***50.83***	***3721***	***98.54***	***55***	***1.46***	***0.0000***	***P***
Market	***23***	***389451***	***377231***	***96.86***	***7209***	***1.91***	***370022***	***98.09***	**-0.0000**	***N***
Book	***30***	***399114***	**393871**	***98.69***	***45791***	***11.63***	***348080***	***88.37***	***-0.0000***	***N***
TD	***30***	***751135***	**744110**	***99.06***	***46663***	***6.27***	***697447***	***93.73***	***-0.0000***	*N*
LTD	***23***	***37430***	**26992**	***72.11***	***6337***	***23.48***	***20655***	***76.52***	***-0.0000***	***N***
Overall	**53**	**788565**	**771102**	**97.79**	**53000**	**6.87**	**718102**	**93.13**	**-0.0000**	**N**

As the number of studies that are employing dividend yield as proxy for dividends attribute is limited (8 studies), it is unreliable to compare its results with dividend payout ratio results and draw a fair conclusion. However, the overall results of the dividend yield proxy suggest a positive influence on debt ratio, which is consistent with pecking order hypothesis. On the other hand, the dividend payout proxy results show overall strong significant negative

correlation debt but with some variation in the strength of the relationship among debt measures and definitions with the relationship in the market-based long-term debt being the lowest.

The suggested moderator variables based on debt measurements and definitions provide support to the hypothesised inverse relationship but with some variation in the strength of which the explanatory power of book based-value debt is relatively better market based-value debt and total debt is considerably out perform long-term debt.

In summary, the overall relationship reveals a strong negative relationship exists between dividends and leverage. However, the moderator variables based on debt measurements and definitions show constantly the expected negative relationship but with variation in the strength. These results, therefore, are inconsistent with pecking order hypothesis. Although limited numbers of studies are using it, dividend yield, as proxy for dividends, seems to be positively correlated with debt ratio, which in turn lends some support to pecking order hypothesis.

3.3.10 Free cash flow

Again, there is no consistent theoretical prediction on the influence of free cash flow on firm's capital structure. Empirically, the overall percentage of significance demonstrates a strong relationship exists between free cash flow and leverage. However, weighted Stouffer test show that the overall direction of this relationship is significant negative relationship. Table 3.13 (final row) shows that about 85.4% of the total sample is significant. However, 78.5% of the significant results are negative and significant at the 1% level.

Table 3.13: **Meta-analysis results of free cash flow attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Free cash flow	7	21633	21465	99.22	6325	29.47	15140	70.53	-0.0097	N
	5	*8340*	*6821*	*81.79*	*6231*	*91.35*	*590*	*8.65*	*0.0017*	*P*
	16	37252	34405	92.36	92	0.27	34313	99.73	-0.0000	N
	9	*10333*	*3568*	*34.53*	*1584*	*44.39*	*1984*	*55.61*	*-0.0861*	*N*
	37	***77558***	***66259***	***85.43***	***14232***	***21.48***	***52027***	***78.52***	***-0.0000***	***N***
Market	***25***	***47585***	***37973***	***79.80***	***1676***	***4.41***	***36297***	***95.59***	**-0.0000**	***N***
Book	***12***	***29973***	**28286**	***94.37***	***12556***	***44.39***	***15730***	***55.61***	***-0.0159***	***N***
TD	***23***	***58885***	**55870**	***94.88***	***6417***	***11.49***	***49453***	***88.51***	***-0.0000***	***N***
LTD	***14***	***18673***	**10389**	***55.64***	***7815***	***75.22***	***2574***	***24.78***	***0.0286***	***P***
Overall	**37**	**77558**	**66259**	**85.43**	**14232**	**21.48**	**52027**	**78.52**	**-0.0000**	N

The moderator variable analysis shows conflicting results. Based on measurement of debt, a significant negative relationship is obtained by using total debt while a significant positive association is observed by employing long-tem debt. On the other hand, the results of based-value moderator variable reveals an inverse relationship but with variation in strength. The explanatory power of the debt market based-value appears to be higher than of the debt book based-value due to the split in the significant results between positive and negative direction in the debt book based-value.

In summary, the overall relationship reveals a moderate negative relationship, which lends a moderate support to pecking order hypothesis. However, the findings of the moderator variables show conflicting results in specific debt-measurement moderator variable.

3.3.11 Liquidity

Theoretically, the influence of liquidity on firm's capital structure is expected to be negative. The current ratio is commonly used to capture the effect of liquidity on leverage. Empirically, Table 3.14 (column 5) weighted Stouffer test produces high significant negative relationship between liquidity and leverage though the overall percentage of significant results associated with this relationship seems to be relatively weak.

Table 3.14: **Meta-analysis results of liquidity attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Current ratio	13	58400	37189	63.68	0	0.00	37189	100.0	-0.0000	N
	51	*17066*	*12168*	*71.30*	*423*	*3.48*	*11745*	*96.52*	*-0.0000*	N
	Na	Na	Na	Na	Na	Na	Na	Na	Na	Na
	55	*15253*	*9540*	*62.55*	*97*	*1.02*	*9443*	*98.98*	*-0.0000*	N
	119	***90719***	***58897***	***64.92***	***520***	***0.88***	***58377***	***99.12***	***-0.0000***	***N***
Market	***55***	***15253***	***9540***	***62.55***	***97***	***1.02***	***9443***	***98.98***	***-0.0000***	N
Book	***64***	***75466***	**49357**	***65.40***	***423***	***0.86***	***48934***	***99.14***	***-0.0000***	***N***
TD	***13***	***58400***	***37189***	***63.68***	***0***	***0.00***	***37189***	***100***	***-0.0000***	***N***
LTD	***106***	***32319***	**21708**	***67.17***	***520***	***2.40***	***21188***	***97.60***	***-0.0000***	***N***
Overall	**119**	**90719**	**58897**	**64.92**	**520**	**0.88**	**58377**	**99.12**	**-0.0000**	**N**

The final row shows that about 65% of the total sample is significant. However, 99.12% of the significant results are negative and only 0.88% is positive.

Moreover, meta-analysis results show that this negative relationship is significant at the 1% level. Similarly, the moderator variable analysis shows consistent negative direction and significant at the 1% level.

In summary, both the overall and the moderator variables results show a relatively weak negative relationship exists between liquidity and leverage. This, in turn, lends support to the pecking order hypothesis.

3.3.12 Age

Theoretically, the influence of age on firm's capital structure is also ambiguous. Usually, the number of years since the firm's foundation is the proxy used to capture the effect of age on leverage. Empirically, the overall percentage of significance demonstrates a strong relationship. Moreover, weighted Stouffer test produce overall high significant positive relationship between age and leverage. Table 3.15 (final row) shows that about 94% of the total sample is significant of which 76.84% of the significant results are positive and significant at the 1% level.

Table 3.15: **Meta-analysis results of age attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
# Of years since established	19	477232	448876	94.06	357809	79.71	91067	20.29	0.0000	P
	12	*22902*	*19190*	*85.98*	*500*	*2.54*	18690	*97.46*	*-0.0000*	*N*
	5	6045	5775	95.53	5775	100.0	0	0.00	0.0000	P
	Na	*Na*	*Na*	*Na*	*Na*	*Na*	*Na*	*Na*	*Na*	*Na*
	36	***506179***	***473841***	***93.61***	***364084***	***76.84***	***109757***	***23.16***	***0.0000***	***P***
Market	***5***	***6045***	***5775***	***95.53***	***5775***	***100.0***	***0***	***0.00***	***0.0000***	***P***
Book	***31***	***500134***	**468066**	***93.59***	***358309***	***76.55***	***109757***	***23.45***	***0.0000***	***P***
TD	***24***	***483277***	***454651***	***94.08***	***363584***	***79.97***	***91067***	***20.03***	***0.0000***	***P***
LTD	***12***	***22902***	***19190***	***85.98***	***500***	***2.54***	***18690***	***97.46***	***-0.0000***	***N***
Overall	**36**	**506179**	**473841**	**93.61**	**364084**	**76.84**	**109757**	**23.16**	**0.0000**	**P**

However, the moderator variable analysis shows conflicting results. Based on measurement of debt, a significant positive relationship is obtained with total debt (row 8) while a significant negative association is observed with long-tem debt (row 9). On the other hand, the results of based-value moderator variable reveals a positive relationship with the explanatory power of the debt market based-value being higher than of that of debt book based-value.

In summary, overall relationship reveals a moderate positive relationship exists between age and leverage. However, the findings of the moderator variables show conflicting results in specific debt-measurement moderator variable.

3.3.13 Government

Similar to some of the above determinants, there is no consistent theoretical prediction on the impact of the government as a large shareholder on leverage. Studies included in the sample are mostly using dummy variable to capture the effect of the existence of government as a shareholder on firm's capital structure. However, one study uses the actual percentage of outstanding shares held by the government as proxy of this attribute. Therefore, such differences are not considered in this analysis as both proxies are potentially using the same data as well as only one study is using the actual percentage.

Empirically, the weighted Stouffer test produces high significant negative relationship between government and leverage though the overall percentage of significance associated with this relationship seems to be relatively weak. Table 3.16 (final row) shows that about 64.88% of the total sample is significant of which 89.34% are negative and significant at the 1% level.

Table 3.16: **Meta-analysis results of government attribute.**

M. V.	N of studies	Total Obs.	Significant						W. S. T.	Dir.
			Obs.	%	Positive		Negative			
					Obs.	%	Obs.	%		
Shares held by Government	10	23254	19486	83.80	2570	13.19	16916	86.81	-0.0000	N
	7	*10483*	*6985*	*66.63*	*0*	*0.00*	*6985*	*100.0*	*-0.0000*	N
	6	4024	281	6.98	281	100	0	0.00	-0.4554	N
	4	*3473*	*0*	*0.00*	*0*	*0.00*	*0*	*0.00*	*-0.2295*	*N*
	27	***41234***	***26752***	***64.88***	***2851***	***10.66***	***23901***	***89.34***	***-0.0000***	*N*
Market	***10***	***7497***	***281***	***3.75***	***281***	***100***	***0***	***0.00***	***-0.2784***	***N***
Book	***17***	***33737***	**26471**	***78.46***	***2570***	***9.71***	***23901***	***90.29***	***-0.0000***	N
TD	***16***	***27278***	***19767***	***72.46***	***2851***	***14.42***	***16916***	***85.58***	***-0.0000***	***N***
LTD	***11***	***13956***	***6985***	***50.05***	***0***	***0.00***	***6985***	***100.0***	***-0.0000***	***N***
Overall	**27**	**41234**	**26752**	**64.88**	**2851**	**10.66**	**23901**	**89.34**	**-0.0000**	**N**

The analysis reveals that the results of both long-term and total debt ratios based on market value appears to be responsible of observing the weak percentage of significance as they show considerably low percentage of significance and insignificant weighted Stouffer results. Moreover, it seems that studies using total debt ratio compared to those using long-term debt ratio have higher percentage of significance but lower negative percentage level.

Nevertheless, this observed negative results contradict signalling theory argued by Leland and Pyle (1977) and part of agency theory, in particular, conflicts between management and shareholders (debt benefits) argued by Jensen (1986). The results, however, are lending support to the other part of agency theory, in particular, conflicts between shareholders and lenders (debt costs) argued by Myers (1977).

In summary, both the overall and the moderator variables results confirm a weak negative relationship exists between government attribute and leverage.

3.4 Conclusion

This chapter presented an alternative methodology that overcomes the deficiency of the traditional narrative reviews. Given the large number of empirical studies, a meta-analysis procedure seems to be an appropriate technique for synthesising scientifically the finding of these studies since it has proved its value in other areas. It is found that tax, growth, uniqueness, dividends, risk, free cash flow, liquidity, government and age attributes appear to be very sensitive to measurement of both leverage and the explanatory variables. On the other hand, the analysis shows that size, tangibility, and profitability have consistent direction and strong relationship regardless to the measurement issue

Based on the theoretical and empirical evidence discussed in the previous and current chapters, this dissertation is intended to extend previous research by providing fresh evidence about the determinant of listed and unlisted companies in Saudi Arabia, a country in which culture and institutional factors are different from those in which the theories were developed. This, in turn, will provide further evidence on the significance of institutional differences that are argued to have an impact on capital structure determinants.

Chapter 4: The Environment within Saudi Framework

4.1 Introduction

Previous cross-country studies have asserted that institutional arrangements are significant determinants of capital structure. Rajan and Zingales (1995) examined whether the capital structure in the G-7 countries is related to factors similar to those that influence the capital structure of US firms. They found that although firms have a fairly similar capital structure across the G-7 countries, there were several institutional characteristics that affect capital structure choice. Booth et al. (2001) investigated whether capital structure theory is portable across the developing countries with different institutional structures. They found that although debt ratios appeared to be affected by the same variables as in developed countries, there were systematic differences in way these ratios were affected by country factors. Barakat and Rao (2004) investigated the role of taxes in the capital structure of 12 Arab countries. They obtained empirical results that support the significance of the institutional differences on capital structure decisions. Recently, De Jong et al. (2007) investigate the importance of firm-specific and country-specific factors in explaining the leverage choice of firms from 42 countries around the world. They found that legal environment and economic conditions affect directly and indirectly the country's firm financing choice.

In summary, all these studies have demonstrated the significant influence of the institutional characteristics on financing decision of the firm. Saudi Arabia is an Arab Islamic country. Officially, it is governed by the Islamic Law (Shari'ah), which is derived from the holy book of Islam (Qur'an) and the prophetic guidance (*Sunnah*). Therefore, the country has some socio-cultural

and economic implications that may affect capital structure choice. The aim of this chapter is to describe in details the institutional characteristics and socio-cultural factors that are expected to have influence on the determinants of the capital structure of Saudi companies.

4.2 Central bank

According to Saudi Arabia Monetary Agency (SAMA) official web sit (www.sama.gov.sa), the top of Saudi Arabia's financial system is SAMA, the central bank of the Kingdom of Saudi Arabia. Since Its establishment in 1952, SAMA's functions as defined by its charter issued in 1952 and amended in 1957 include the following:

Issuing and strengthening the Saudi currency and stabilising its internal and external value;

Dealing with the banking affairs of the government; and

Regulating commercial banks.

The monetary policy in Saudi Arabia is set to maintain a stable financial environment in terms of low inflation and a fixed exchange rate. To this end the Saudi Riyal (SAR) has been effectively pegged to the American Dollar at SAR 3.75 per U.S. Dollar since 1986. Beside vast state revenues from oil, SAMA's close monitoring of the exchange rate of Riyal has contributed to maintaining the stability of this rate. Exchange rate stability constitutes an intermediate target of the monetary policy of the Kingdom for achieving the ultimate goal of preserving domestic price stability.

In order to achieve the ultimate goal for its monetary policy, SAMA uses a range of traditional and modern monetary instruments. These include the statutory reserve requirement on bank deposits, liquidity ratio, and deposit limits, prudent restrictions on advances and loans, government development bonds, treasury bills and floating rate notes and foreign exchange swap transactions. The Kingdom's monetary policy has succeeded remarkably in maintaining the stability of the Riyal's exchange rate and domestic prices over a prolonged period of time. As mentioned earlier, Riyal's parity with the U.S. dollar has remained unchanged since 1986, and the inflation has recorded an average rise of only 0.1 percent over the last 20 years (Al-Sayari, 2003).

As set out in its charter, SAMA's main objectives include supervision of commercial banks. The Banking Control Law was issued in 1966 under a royal decree. This legislation has vested SAMA with large powers to carry out actions believed appropriate to maintain the consistency of commercial banks and ensure their financial solvency. According to SAMA Governor, SAMA supervises commercial banks in accordance with the latest internationally applied standards and practices, such as the Basel Committee's Core Principles of Effective Banking Supervision, International Accounting Standards (IAS), the best practices of disclosure, and recommendations of the Financial Action Task Force (FATF).

To facilitate its monitoring and supervision procedures, SAMA, in cooperation with commercial banks, has introduced advanced and comprehensive electronic payment systems. These include the Automated Check Clearing Houses, the Saudi Payments Network (SPAN), Points of Sale

(POS) terminals, the Saudi Arabian Riyal Interbank Express (SARIE). Moreover, SAMA introduced the Electronic Share Information System (ESIS) that has been replaced by a more comprehensive and modern system, called (TADAWUL), to supervise and monitor the Saudi Stock Market (SSM).

4.3 Banking system

According to Saudi British Bank (2003), the history of banks in Saudi Arabia backs to 1926 when the Dutch Trading Company (presently the foreign partner of the Saudi Hollani Bank) was established as the first bank to operate in the Kingdom. The Company operated through a representative office in Jeddah to serve pilgrims arriving from Indonesia. The bank, as the only financial institution operating in the Kingdom, played the role of a Central Bank and acted as depository for the Kingdom's gold reserves. The first oil related operations were conducted through the bank. The second entry to the banking sector came in 1948 with the French Indochine Bank setting up a branch in Jeddah. The bank later merged with Suez Company to form the Indo-Suez Bank, which is presently the foreign partner of Banque Saudi Fransi.

Established in 1950, the National Commercial Bank (NCB) was the first entirely Saudi bank in the kingdom. The bank operated as a partnership until 1997 when it was converted to a joint stock company. In 1999, the Public Investment Fund (PIF) acquired a 70% stake in NCB and the General Organization of Social Insurance ("GOSI") acquired 10 percent, while a rich family (Bin Mahfuze that is the founder of the bank) holds the remaining shares. However, the shares of NCB are expected to be listed soon on the

Saudi stock market. The first bank to be established as a joint stock company was Riyad Bank in 1957 with 43% of its shares being held by the government through (PIF).

Mergers in the sector began in 1997 with the Saudi-Cairo Bank merger with the Saudi United Bank. Later in 1999, the Saudi United Bank merged with the SAMBA financial group[8]. Moreover, year 2005 witnessed the listed new commercial Islamic bank (Bank Al Belad) as a result of the merger between currency exchangers (owned by families) operating in the country.

The Saudi banks have significant weight in the Gulf and Middle East regions in terms of their total assets. Table 4.1 shows that total assets of banks, on average, constitutes 68.5% of the country GDP.

Table 4.1: **Total Assets of Saudi Banks (in billion SAR)**

Year	2000	2001	2002	2003	2004
Total assets	453.3	472.4	508.2	545.2	655.4
As % Of GDP	64.1%	68.8%	71.9%	67.8%	69.8%

Source: Saudi Arabian Monetary Agency (www.SAMA.co.sa)

As can be seen from the table, the banks have been able to achieve excellent growth rate in their assets over the period, with aggregate assets of the sector reaching SAR 655.4 billions at the end of year 2004, which represents an increase of 44.6% compared with 1999.

[8] SAMBA is formerly Saudi American Bank, which is a joint venture between city bank (20%) and some Saudis rich families. However, in med of 2004, city bank sold its share to Saudi government represented by Saudi pension fund.

Currently, there are eleven banks in the Kingdom, of which ten are publicly listed. Table 4.2 shows the equity stakes (percent share) and the size of Saudi banks based on their total assets and total equities.

Table 4.2: **Equity stakes and total assets & equity of banks as end of 2006**

Bank	Total Assets (Millions SAR)	%	Equity (Millions SAR)	%	GOV.	J. S.	Foreign	Others
National Commercial Bank (unlisted)	188,464	22%	23,999	21%	79.3%	0%	0%	20.7%
SAMBA Financial Group	124,015	14%	15,300	13%	43.9%	0%	0%	56.1%
Al Rajhi Banking & Investment Corp.	105,209	12%	20,179	17%	9.7%	0%	0%	90.3%
Riyad Bank	94,016	11%	11,992	10%	48.9%	0%	0%	51.1%
Banque Saudi Fransi	79,581	9%	9,405	8%	11.3%	0%	31.1%	57.6%
Arab National Bank	78,035	9%	7,980	7%	8.7%	0%	40%	51.3%
Saudi British Bank	77,189	9%	9,405	8%	8.6%	0%	40%	51.4%
Saudi Hollandi Bank	46,740	5%	4,258	4%	7.3%	0%	40%	52.7%
Saudi Investment Bank	40,845	5%	6,001	5%	35.9%	10%	7.5%	46.6%
Bank Al Jazira	15,713	2%	4,194	4%	0%	9%	5.8%	85.2%
Bank Al Belad	11,281	1%	3,024	3%	0%	0%	0%	100%
Banking Sector	**861,088**	**100%**	**115,737**	**100%**	**23%**	**2%**	**15%**	**60%**

Source: Bakheet Investment Group (www.bakheetgroup.com)

Based on total assets, the Saudi banks can be classified into three categories:

Large Banks: This group consists of all banks that have total assets and equity greater than 10% of the total sector. This includes the National Commercial Bank, SAMBA Financial Group, Riyad Bank and Al Rajhi Banking & Investment Corp.

Medium Banks: This group consists of all banks that have total assets and equity range from 5-10% of the total sector. This includes Bank Al Saudi Al

Fransi, the Saudi British Bank, Arab National Bank, the Saudi Hollandi Bank and Saudi Investment Bank.

Small Banks: This group consists of all banks that have total assets and equity less than 5% of the total sector. This includes and Bank Al Jazira and Bank Al Belad.

In general, the banking system appears to be concentrated. The top four banks hold a significant share of the total banks assets with 59%. Moreover, government ownership is relatively extensive, exceeding 30% in four banks and reaching 79% in one bank. Foreign bank participation is mainly through substantial equity positions as opposed to majority shareholdings. Four banks have foreign equity stakes of 31% or more.

In Saudi Arabia, the banking system consists of both Islamic and conventional banking systems. In general, all Saudi banks are involved in Shari'ah-compliant finance, but with different strategies. Al-Rajhi Banking and Investment Corporation and Bank Al Belad offer only Shari'ah-compliant products with the first being the worlds largest in that sector (IMF Country Report, 2006). In other banks, non-interest-bearing deposits are isolated from interest-bearing deposits and are intermediated through Shari'ah-compliant investments[9]. Moreover, all banks submit all new Shari'ah-compliant types of transactions to internal Shari'ah advisory boards in order to check their conformity with Islamic principles.

[9] About 40 percent of deposits are non-interest-bearing, a key structural factor supporting the profitability of the banking sector (IMF Country Report, 2006).

The underlying principle of Islamic banks is that there can be no interest charged on any transaction or service, as interest is considered usury and is condemned by the Quran. The glorious Quran states: *Those who devour usury will not stand except as stands one whom the devil by his touch has driven to madness. That is because they say: Trade is like usury: but Allah has permitted trade and forbidden usury.... Allah will deprive usury of all blessing, but will give increase for deeds of charity, for He loves not any ungrateful sinner.... of your demand for usury, if you are indeed believers. If you do it not, take notice of war from Allah and His messenger, but if you repent you shall have your capital sums; deal not unjustly, and you shall not be dealt with unjustly. And if the debtor is in difficulty, grant him time till it is easy for him to repay. But if you remit it by way of charity, that is best for you if you only knew.* [Surah al Baqarah, verse 275-280].

However, interest is replaced by a share-out key determined in advance for a share of risks and profits among the borrower, the bank, and the productive capital (Barakat and Rao, 2004). There are a number of traditional shari'ah-compliant financing products, which can be classified into two categories. Following provides very brief review of these instruments.

A. Partnership Contracts

In tolerating profits as opposed to interest, Islamic finance allows partnership contracts. There are two principal forms of partnership contracts in Islamic finance that also employ the principles of profit/loss sharing. These are:

Mudaraba: This form of a contract is structured between the Rabb'ulmal (i.e. supplier of capital) and the entrepreneur who services it. One party supplies

the capital to a second entrepreneurial party (mudarib) for the procession of some trade on the condition that the resulting profits are distributed in mutually agreed proportions while all capital loss is borne on the provider of the capital. In case of loss, the entrepreneur bears the brunt of the opportunity cost of time and labour.

Musharaka: The meaning of the Arabic word musharakah is derived from the word sharikah meaning partnership. A musharakah contract is very similar to the conventional sense of a partnership arrangement where the partners or shareholders use their capital through a joint venture, Limited Partnership, to generate a profit. However, profits or losses are split between the shareholders according to some agreed-on pre-determined formula depending on the investment ratio.

B. Exchange Contracts

Working capital financing is a keystone of every financial system. According to shari'ah, extended lines of credit that bear interest are not allowed. Consequently, other avenues of working capital financing are required and these are found in exchange contracts. Unlike partnership contracts, these types of contract do not entail partnership engagements.

Price deferred sale: there are two type of price differed sale contract, namely, Murabaha and Bai'muajjal. In a Murabaha contracts, the buyer can seek for Rabb'ulmal or money provider (e.g. bank) that finances the purchase of an asset by buying it on behalf of her/him. Rabb'ulmal then adds a mark-up in its sale price to its client who pays for it on a deferred basis. It is deemed acceptable for good's supplier to charge higher prices for deferred payments.

Such transactions are regarded as trades and not loans. Financing on such a deferred payment basis is called Bai'muajjal.

Goods Deferred Sale (Bai'salam): A manufacturer seeks Bai'salam when he/she seeks to finance the production of goods he is financing. This involves the buyer to pay price in advance at a discount to the producer before the delivery time. This form of contract is very similar to the Bankers' Acceptance financing in the conventional banking system (Barakat and Rao, 2004).

Ijara: The meaning of the Arabic word Ijarah is rent. It is an Islamic form of leasing. Here, the Rabb'ulmal (e.g. leasing company or bank) buys land, machinery or equipment such as aircrafts and ships and leases it out under instalment plans to end-users. As in Western leasing, there may be an option to buy the goods built into the contracts. The rental rates of returns on the contract can be both fixed and floating depending on the particular originator.

The share of Shari'ah-compliant banking services and products has grown rapidly in recent years. To fill the gap, all Saudi commercial banks have engaged in two main Sharia-compliant products namely, Bai'salam and murabaha. At end-2003, Bai'salam constituted 46% of total Sharia-compliant banking sector assets while *murabaha* transactions accounted for 31% (IMF Country Report, 2006). However, most of the Shari'ah-compliant products are at the individual level. According to Barakat and Rao (2004), the National Commercial Bank of Saudi Arabia reported in 2002 that 95% of their business was done with individuals to buy durable goods.

Generally, the banking sector in the Saudi Arabia is quite advanced and supported by a modern and efficient payment and settlement infrastructure. The capacity of sector to respond to macroeconomic shocks has been considerably strengthened over the past decade. According to an IMF Country Report (2006), the banking sector is robust to various credit, liquidity, and interest rate events. However, despite the overall robustness of the banking sector and its supporting infrastructure, the role of the banking sector in financing the private sector and meeting its credit needs remains relatively limited. Rajan and Zingales (1995) argue that a good measure to determine the importance of the banking sector in financing firms is the ratio of bank claims on the private sector to the gross domestic product (GDP). Table 4.3 shows the total bank claims on the private sector from 2000 to 2004. On average, bank claims on the private sector amount to only 28.5% of GDP, exceeding 30% in year 2004.

Table 4.3: **Bank claims on the private sector**

Year	2000	2001	2002	2003	2004
Bank Claims on the Private Sector	172.2	187.1	205.8	228.5	313.9
As % Of GDP	24.4%	27.3%	29.1%	28.4%	33.4%

Source: Saudi Arabian Monetary Agency (www.SAMA.co.sa)

If compared to the international data found in Rajan and Zingales (1995), the 28.5% ratio is far below the 104.22%, 86.58%, 80.03%, 70.9%, 53.85%, and 44.21% for Japan, Germany, France, United States, United Kingdom, and Canada respectively but close to 33.04% for Italy[10].

[10] The data extracted from table VII (page, 1448).

Such weak role of the banking sector may reflect most banks' conservative banking lending policy represented by the costly requirements. Indeed, for example, SAMBA Financial Group requirements for long-term debt are as follow:

Partial financing of the project by the firm.

Sufficient collateral assets at least to cover 100% of the value of the loan.

Comprehensive study of the feasibility of the project showing the expected cash flow.

The history of the firm including sales, other loans, tangible assets, past and expected growth, profitability and fixed costs the firm usually faces

Such requirement would increase the cost of long-term debt and, thus, one would expect to observe low level of debt in general and long-term of debt in specific. Moreover, the conservative policy of banking is expected to be more in lending to small-middle enterprises (SMEs). Bevan and Danbolt (2002) argue that small companies are found to use the various short-term elements rather than long-term debt, which may indicate that they have difficulty accessing long-term borrowing. Therefore, such companies in turn would rely more on short-term debt as this term of debt does not require collateral assets. They may also rely more on trade credit, especially when such debt instrument is compliant with Shari'ah (Bai'muajjal).

In light of these facts, one would expect a low level of interest-bearing debt in Saudi Arabia compared to other countries. Moreover, when firms use debt as

a source of funds, firms would employ more short-term than long-term debt due to costly requirements asked by banks.

4.4 Capital Market

In Saudi Arabia, the specialized financial institutes and brokerage houses do not exist. The capital market in Saudi Arabia consists of the bond and the stock markets.

4.4.1.1 Saudi Stock Market (SSM)

According to TADAWUL official web (www.tadawul.com.sa), during the 1930's, an official stock market began in the kingdom of Saudi Arabia when the first joint stock company- the Arab Automobile Company- issued shares. By the middle of the 1970's, the total number of joint stock companies had risen to only fourteen, mainly concentrated in the cement and electricity sectors. In the late 1970s, the Saudi government decided to be more pro-active in developing the primary stock market by participating in the formation of many joint stock companies through the various secondary investment agencies that it had established- e.g. the Retirement Pensions Agency and the General Organization for Social Insurance. These agencies helped found several companies by supplying start-up capital (Basheikh A, 2002). Also, the Public Investment Fund invested a sizable portion of its capital in the formation of new joint companies. In the late 1970's, the primary market witnessed tremendous growth when 19 new companies were offered to the public; this included a number of publicly held joint ventures banks that were owned by the public and major foreign institutions. They included Citibank (presently SAMBA Financial Group), British Bank of the Middle East

(presently Saudi British Bank), ABN-Amro (presently Saudi Holandi Bank), and Banque Indosuez (presently Saudi Faranci Bank). However, due to the lack of trading regulation at that time, stock trading was fairly limited.

According to Basheikh A. (2002), in the early 1980's, another jump in the development of the primary market took place in terms of the number of transaction and the marketability of securities when oil prices were increasing which in turn increased the government ability to finance many long-term development projects that were carried out by joint stock companies. Moreover, in 1984, the government decided to privatise 30 percent of the Saudi Basic Industrial Corporations (SABIC), which was valued at SAR 3 billions. Therefore, the essential factor in the basic development the primary stock market in the kingdom has been government support.

However, until the early of 1980's, the market remained informally organized. In 1984, Royal Decree No. 1320/8 was approved and a combined ministerial committee including the Minister of Finance, the Minister of Commerce and the Governor of SAMA was formed to regulate and develop the Saudi Stock Market (SSM). The committee aimed to improve and develop the market by (i) encouraging Saudi investors to invest in the domestic economy in order to contribute to its growth, (ii) providing Saudi companies with a source of finance through the issue of securities, (iii) concentrating equity trading in a single market in which buy orders are matched so as to establish a fair price, (iv) providing an efficient market for the execution of all orders, supported by the latest electronics facilities, (vi) supplying efficient settlement and registration procedures which ensure the timely delivery of and payment for

security transactions and (vii) protecting investors and companies by the enforcement of effective equity market rules and procedures (SAMA, 1995).

In order to accomplish these objectives, in April 1984, the ministerial committee issued new rules and regulations that included the following: (i) establishing of a share trading system through commercial banks; (ii) setting up a supervisory body for all securities trading; (iii) establishing a share control department (SCD) under the authority of SAMA and (iv) establishing a Saudi Share Registration Company (SSARC).

In December 1984, SAMA established a share trading system to control and supervise the stock market. Commercial banks were to act as intermediaries in the purchase or sale shares on behalf of their clients; they were not allowed to buy or sell shares for their own interest. Each commercial bank was required to form a central trading unit (CTU) in the capital city Riyadh that would receive orders form branches. In carrying out these transactions, the commercial banks earn a commission based on the transaction value (up to a maximum of one percent) to be paid by both the seller and the buyer (SAMA, 1985).

According to SAMA (1995), in the second half of 1990, SAMA introduced the Electronic Securities Information System (ESIS). The system was introduced gradually starting with Riyadh, the capital city, and eventually covered the kingdom by the end of 1990. The system basically created a floorless, computer-based stock market covering the kingdom; it allowed buy (sell) orders that were entered at one bank's share trading terminal to be matched instantaneously with corresponding sell (buy) orders entered in to the

system by any other bank. Advance developments to this system have seen the introduction of ESISLINE in 1992 and ESISNET in 1993. With these developments, it is now possible for a buyer or a seller to enter any connected Saudi bank branch, observe the price for the company in question, and place an order that can be executed in seconds if it is within the market price range. The order can be then be settled within 24 hours complete with the exchange of (i) transaction proceeds and (ii) the documentary evidence of the new title.

The latest development for the system occurred in October 2001 when SAMA introduced a new service (TADAWUAL) for the trading and the settlement of shares in Saudi Arabia. This new system provides a continuous, order driven market, with up to the minute price, volume and the company information; it facilities an efficient and short trading cycle (www.tadawul.com).

In 1985, the National Centre for Financial and Economics Information (NCFEI) produced the first indices of the Saudi Stock Market. Other indices were prepared by a number of commercial banks at that time. In March 1987, SAMA considered the NCFEI indices to be the official indices of the Saudi Stock Market. The NCFEI indices have a base value of 100 and change according to the share price data supplied by the share control department in SAMA. The indices published include a general index of the market and six sub-indices for the various sectors (Banking, Industrial, Services, Agricultural, Electricity, and Cement). These indices and daily trading information for all shares are published in the daily newspapers (Basheikh A, 2002).

The SSM is considered as one of the largest stock market in the Arab world in terms of market capitalisation, with SAR 1,148.6 billions (about £164.1 billions) as at the end 2004. Table 4.4 shows that there are 73 joint stock companies listed in the stock market, belonging to seven major sectors. This figure is projected to increase with the expected listing of additional companies over the next few years[11].

Table 4.4: **size of the Saudi stock market as end of 2004**

Sector	Number of companies	Market Capitalization (SAR billions)	%
Banking	9	355	30.3%
Manufacturing	26	228	30.9%
Telecom	2	111	19.9%
Electrical	1	59	9.7%
Cement	8	42	5.1%
Services	18	5	3.7%
Agricultural	9	355	0.5%
Total	**73**	**1,149**	**100**

Source: Saudi Arabian Monetary Agency (www.SAMA.co.sa)

As Table 4.4 shows, the dominant sectors are the manufacturing and banking sectors with above 30% of total market capitalisation of the market followed by Telecom sector with about 20%. Other sectors are the Electrical Company with 9.7% and cement with 5.1% while the services sector represents nearly 4% and agriculture is only 0.5%.

It is believed that the degree of development of stock market influences financial decisions from stock split, to dividends, to stock issuance and to capital structure. To show the importance of the Saudi stock market in a firm's financial decisions, Table 4.5 shows a time series indicators and ratios on the stock market over the period 2000 to 2004.

[11] As the end of 2006, the number has increased to 86 companies.

Table 4.5: **Stock market indicators**

Year	2000	2001	2002	2003	2004	Average
Stock market capitalization (billions SAR)	254	275	281	590	1,149	531
As percentage of GDP	35.9%	40.1%	39.7%	73.4%	122.4%	62.3%
Value of shares traded (billions SAR)	65	84	134	596	1,774	510
Number of shares traded (Millions)	555	692	1,736	5,566	10,298	3769
Number of transactions (Thousands)	498	605	1,034	3,673	13,320	3826
Number of firms	75	76	68	70	73	72

Source: Saudi Arabian Monetary Agency (www.SAMA.co.sa)

The table shows that the market capitalization jumped from SAR 254 billions in year 2000 to SAR 1,149 billions in year 2004 with average growth 53.8% and exceeded 100% in year 2003. Moreover, from 2000 to 2004, the value of shares and the number of share traded, witnessed a remarkable increase. The number of shares traded in the SSM during 2000 was approximately 555 millions. This number exceeded 10 billion in 2004. A similar pattern emerges when the volume of share statistics are analysed. The number of transactions jumped from 498 thousands in 2000 to over 13 millions in 2004.

Although a strong growth is observed in Saudi stock market, it continues to lack depth. The number of listed companies and the size of the free-float of shares are small. The average of 72 companies listed in the market is considered extremely small[12]. Moreover, the relatively high proportion of shares held by the government and the concentration of ownership in a few hands of private investors keep a low percentage of stocks in circulation. The lack of brokerage houses and independent credit rating agency also constrains

[12] The number decreased in year 2002 due to the emerging of 10 electrics companies in one company.

intermediation of information, which in turn would expose the investors to act based on rumours rather than on the basis of real fundamentals. The existence of such agencies is considered as one of the key elements to attracting national savings for investment in productive projects that would then create the potential for establishing more joint stock companies (Bakheet, 1999).

In summary, despite the lack of market depth, stocks remain the first choice financing among listed companies. Rajan and Zingales (1995) suggest that a good measure to determine the importance of the stock market is the ratio of stock market capitalisation to the gross domestic product (GDP). Table 4.5 shows the market capitalisation from 2000 to 2004. On average, market capitalisation compromises 62.3% of GDP and exceeds 120 % in year 2004. Comparing this ratio to those of the G-7 studied by Rajan and Zingales (1995), we find the 62.3% is higher than United States (49.85%), Germany (25.79%), France (19.54%), Italy (21.17%) and Canada (50.56%) but less than Japan (85.31%) and United Kingdom (83.70%). Moreover, this ratio is higher than those of 10 developing countries studied by Booth et al. (2001) except Malaysia (68%). Moreover, comparing the ratio of market capitalisation to GDP (62.3%) with the ratio of bank claims on the private sector to GDP (28.5%), would suggest that public (equity) is more important than private financing (bank debt).

4.5 Bond market

The debt market consists of government bond market and corporate bond market. Since 1988, Saudi authorities have been relying on internal financing through issuing government bonds to finance their activities and borrowed

from banking sector to cover the budgetary deficit. SAMA through its investment department is the fiscal agent and debt manager by conducting monthly auctions and cites the volume of bond offered. Bonds include treasury bills, which range from one week to one month in maturity; floating rate notes with maturities at five years and seven years; and government development bonds (GDB) with maturities at two, three, five, seven, and ten years. However, the holdings of government debt securities are concentrated in government financial institutions, namely, the Pension Fund and the General Organization for Social Insurance (GOSI) and domestic commercial banks. The Pension Fund and the GOSI, however, own about 75% of the central government debt stock (IMF country report, 2006). During the last 15 years, the government debt market went through evolutionary changes in terms of issuance procedure, pricing, maturity spectrum, and settlement (Al-Sayari, 2003). In March 2004 the SAMA introduced a "Dutch" auction system for pricing GDB's, replacing the previous system of predetermined prices.

On the other hand, the corporate bond market has a short history although the requirements of issuing corporate bonds are formulated under articles 116 to 119 of the Companies Act since 1965. According to the International Monetary Fund (IMF) country report (2006), the Saudi ORIX Leasing Company offered the first corporate bond issue in March 2003, amounting to SAR 45 million. The report described the Saudi's corporate bond market as fledgling. However, the report argues that the condition under Article 117 of the Companies Law, which constrains the total amount of bonds that a company may issue to not exceed paid up capital may inhibit corporate bond market development. The IMF recommended this statutory constraint on

issuance should be removed since it keeps the issuing cost of short- and medium-term debt securities, such as commercial paper or medium-term notes expensive.

In sum, the Saudi bond market, in particular, corporate bond market is negligible in the primary market. Moreover, bonds are not liquid due to the non-existence of secondary bond markets. This in turn would suggest that bank loans are the main debt-financing instrument.

4.6 Legal system

According to Ministry of Commerce and Industry (1999), article 218 of the corporate law gives management the right to run the firm during the proceedings. Moreover, on January 2, 1996, the Council of Ministers approved the Code of the Settlement Preventing Bankruptcy. The Code, which came into effect on June 1, 1996, provides a framework in which the debtor may reach a settlement with his creditors to avoid bankruptcy. The Code allows debtors to seek agreement with their creditors through committees to be set up at various local Chambers of Commerce in the Kingdom. If a settlement cannot be reached, or if the debtor so wishes, he may apply to the Sharia court, which reportedly does not allow repossession on grounds of compassion, and request that it call his creditors to offer them a settlement to avoid bankruptcy. When settlement proceedings begin, claims against the debtor are to be dropped.

In sum, one can conclude that the Saudi legal system suffers from weak law and from weak enforcement of this law. These weaknesses in turn would

make the debt an expensive source of finance as the banks' requirements become more restrictive in lending to firms in such legal system.

4.7 Tax system

One of the features in Saudi's economy is the absence of income tax on citizens. Instead, there is one form of tax that is called Zakat, which is generally based on a payers' net worth. Zakat is known as the third pillar of Islam, which indicates its importance and fundamental character in the religion. It can be defined as a system that organizes the transfer of wealth from the rich to the poor and needy. Literally, the word Zakat means purity or purification. Moreover, the payment of Zakat is regarded primarily as an act of worship of God. In the Holy Qur'an great stress is laid on the Zakat. The glorious Qur'ân states: *Take of their wealth a portion (as charity) to purify them by it.* [Surah AL Taw'bah, verse 103].

It is believed that one of the reasons for the imposition of the Zakat is the fact that Islam calls for the purity of both the soul and the body. Since it is required from the rich to satisfy the needs of the poor, the paying of the Zakat, no doubt enhances caring within society and strengthens the relationship between the wealthy and the poor and needy. It reflects fulfilment of an early concept of social justice, as it is taken from each person according to his capacity.

In Saudi Arabia, the government department of Zakat and Income Tax (DZIT) is responsible to manage the religious obligation of Zakat and tax. The Zakat on the individual's annual income from any legal source amounts to 2.5%. A Saudi company also pays 2.5% of the Zakat base. According to the

department of Zakat and Income Tax, Zakat base includes the share capital, retained earnings or accumulated deficit, long-term loans, notes payable and advances if they are used to finance fixed assets. Furthermore, the adjusted net income for Saudi Income Tax and Zakat purposes is added to the Zaka base. Deduction from the zakat base include net fixed assets and properties under construction, dividends distributed during the year not to exceed retained earnings at the beginning of the year, investment in other Saudi companies and Saudi government bonds, and adjusted deficits. If the Zakat base is negative or lower than the adjusted net income for the year, Zakat is imposed on the adjusted net income. If both are negative, no Zakat is due.

Barakat and Rao (2004), argue that, in the non-tax Arab countries, the use of debt is no different from the use of equity as the payout on both is treated the same in the absence of tax advantages of debt for the corporation or tax advantage of equity for the investor. Consequently, the tax advantages of debt suggested by the trade off theory are expected to be minimal among Saudi firms.

4.8 Ownership pattern

La Porta et al. (1999) find a relationship between legal protection and ownership concentration in which countries with weak protection for investors tend to have higher ownership concentration and firms are typically controlled by families or the State. Therefore, it is not surprising to find that company ownership is highly concentrated and mainly controlled by families or the government in Saudi Arabia. Table 4.6 shows the percentage of the equity stake held by groups, namely, government, joint stock, foreign and others.

Table 4.6: **Equity stakes (percent share)**

Sector	Gov.	Joint Stock	Foreign	Others
Banking	23%	2%	15%	60%
Manufacturing	49%	4%	1%	46%
Telecom	70%	0%	0%	30%
Electrical	76%	7%	0%	17%
Cement	19%	2%	2%	77%
Services	19%	1%	0%	80%
Agricultural	10%	0%	0%	90%
Total	**38%**	**2%**	**3%**	**57%**

Source: Bakheet Financial Advisors (www.bakheetgroup.com)

The largest share is held by others (founder of the firms who are mostly rich families and individual investors) with 57% of the total market capitalisation and reaches 90%, 80%, and 77% in agricultural, services and cement sectors respectively. It is estimated that up to 90% of the companies are wholly family-owned, compared to 70% in the European Union of which at least 500 of them can be classified as large in terms of volume of business (Washingtonpost.com). This means that 90% of 57% (or 51%) owned by family. Furthermore, as being the founder, wealthy families are the major shareholders of banks and, thus, they occupy the board of directors of these banks. For example, three out of the ten listed Saudi banks are founded by single family such as Bank Al-Jazira, Al Rajhi Banking & Investment Corp or by a small number of allied families such as bank Al Belad.

As will be discussed shortly in the next section, the government have privatised some public enterprises in key industries but have maintained a majority. The table shows that government ownership is relatively extensive with overall 37% of the total market and reaches 76% and 70% in electrical and communication sectors respectively. Foreign share constitutes only 3% of the total market and reaches 19% in banking sector while cross ownership of joint stock companies' comprise only 2% of the total market.

Although the Saudi Stock market is closed for trading to non-Saudis with the exception of the Gulf Cooperation Council (GCC) nationals, there are foreign partners who hold shares mainly in the banking sector[13]. However, foreign shareholding constitutes only 3% of the total market and reaches 19% in banking sector. Moreover, Saudi joint stock companies have cross ownership in which one company can own shares in other companies. For example, Saudi Basic Industries Corporation is the second largest shareholder of Saudi Arabian Fertilizer Company with 43% of the company's total outstanding shares. Some banks have ownership in other companies, in particular large companies. There are 30 cross ownerships among companies but with overall shareholding of just 2% of the total market.

As pointed out earlier, 500 of the family-owned companies in Saudi Arabia can be classified as large. Indeed, the table in Appendix 2 shows that 62 companies out of the large 100 Saudi companies are privately held corporations. These large corporations are the outcome of investments by a single family or a small number of allied families. The structure of most of these corporations is that each one has a business group that is organized around a holding company. For example, Olayan Group is a single family-owned corporation comprising 50 companies and affiliated businesses engaged in distribution, manufacturing, services, and investment (www.olayan.com). In order to keep the control of business activity within the family, family members usually manage and control the firm.

[13] GCC countries are Bahrain, Kwait, Qatar, Oman, Saudi Arabia and the United Arab Emirates

4.9 The privatisation program

Following two gulf wars and continued fluctuations in oil prices, Saudi Arabia started to experience budgetary deficits. Because of these crises, the Saudi authorities realized the importance of restructuring their economy in order to overcome these difficulties. Consequently, during the 1990s, Saudi Arabia underwent privatisation programs aimed at reducing government expenditure and inviting the private sector to take a more effective part in shaping the national economy (Naser, 1998).

According to the Ministry of Planning, (2000), the successful implementation of the government's privatisation policy will be guided by consideration of all social and economic conditions prevailing in the Kingdom. The privatisation policy concentrates on the following four themes:

Financing: mobilizing private funds for investment in ongoing public sector projects which experience financing difficulties due to budgetary constraints;

Privatising Management: granting the private sector more opportunities to manage and operate public sector projects;

Divestment: The gradual sale to the private sector of government shares in joint stock companies, following in-depth studies of each individual case, so that the social and economic costs and benefits can be properly evaluated and timing can be determined when appropriate conditions prevail; and

Deregulation and promotion a positive climate for private investment through extending and increasing the effectiveness of the market mechanism.

It can be inferred from these themes that the state-owned companies are facing financial difficulties and the feasible solutions is equity financing via offering to the public part of its shares but with the government remaining a large shareholder. In light of this evidence, one can conclude that state-ownership of companies is likely to have a negative effect on debt levels.

4.10 Conclusion

This chapter presents the cultural and institutional aspects that are expected to affect the firm's capital structure in Saudi Arabia. Though the Islamic law provides a variety of shari'ah-compliant financing products, banks limit the use of such products to individual customers. Such a limited role for banks reflects most likely the weak legal system and weak enforcement of this law in the country. The role of bond market is also very small due mainly to the requirements imposed on firms under the company's law and due to the non-existence of a secondary market.

The growth observed in the stock market over the period of study would also suggest a negative effect on the level of debt of those listed companies. Falling costs of equity due to the high increase in the stock prices would motivate listed companies to rely more on equity to finance their growth. Moreover, the country has a unique tax system, which imposes a tiny percentage of zakat (tax) on Saudi firms. In such a system, the tax advantages of debt are expected to be minimal.

The chapter also shows that the pattern of company ownership is highly concentrated in which rich families and government are the major shareholders of both the banks and the companies. This in turn would reduce

the agency costs of debt and would have a positive impact on firms' debt levels in particular those large firms who have link with banks.

However, the effect of socio-cultural and institutional factors on the determinants of capital structure will be discussed in the next chapter when the hypotheses will be developed in the context of such factors.

Chapter 5: Hypotheses Development

5.1 Introduction

Capital structure theories have very little to say about inter-country differences in corporate financing patterns. No existing theory explains how country-specific factors affect firm's capital structure. However, empirical studies, in specific, cross-country studies (e.g. Rajan and Zingales, 1995; Booth et al., 2001; Giannetti, 2003; Fan et al., 2004; Hall et al., 2004; De Jong et al., 2007) demonstrate that inter-country variation in corporate leverage depends on institutional differences. Rajan and Zingales (1995) argue that the institutional characteristics that affect capital structure are: tax code, bankruptcy laws, state of development of bond markets and patterns of ownership. Moreover, De Jong et al. (2007) find that institutional and legal environment and economic development affect not only the level of corporate leverage, but also firm-level determinants of leverage.

Accordingly, the purpose of this chapter is to develop testable hypotheses about those variables found in prior empirical studies to potentially determine a firm's debt ratio in the context of the unique institutional characteristics of Saudi Arabia addressed in the previous chapter. Section 5.2 presents hypotheses development. Section 5.3 demonstrates the leverage measurements. Section 5.4 presents the measurement of explanatory variables. Finally, Section 5.5 provides a conclusion for the chapter.

5.2 Hypotheses development

5.2.1 Size

Theoretically, it has been argued that large firms are more likely to have higher debt level than their smaller counterparts. Rajan and Zingales (1995)

and Graham et al. (1998) argue that large firms tend to be more diversified and have more stable cash flow and, thus they have less probability of going bankrupt. Accordingly, a positive relation between leverage and firm size would be observed. The main empirical research in general supports the positive influence of size on firm leverage. The empirical finding of previous studies analysed in chapter three reveals that 95.51% and 90.12% of the significant results are positively correlated with total and long-term debt ratios respectively. As total debt includes short-term debt elements, the higher percentage associated with it (i.e. 95.51% compared to 90.12%) implies that also short-term debt is positively related with size.

It has been established that most of the large Saudi firms are business groups that are organized around a holding company. This indicates that they are diversified and, thus, are less likely to be exposed to financial distress and default. As a result, Saudi larger firms are expected to have higher level of interest-bearing debt than their smaller counterparts. Thus, the following hypothesis is proposed:

H1 a positive relationship will exist between size of the firm and debt ratios.

5.2.2 Profitability

One of the main theoretical controversies concerns the relationship between leverage and profitability. While trade off theory suggests a positive association between profitability of the firm and leverage due to the tax deductibility of corporate interest payments, the pecking order hypothesis suggests negative relationship due to information asymmetric consideration. Empirically, the overall results reveal that profitability has strong negative

influence on leverage which in turn provides strong support to the pecking order hypothesis but contradicts trade off theory.

It has been pointed out earlier that Saudi firms are subject to low tax (Zakat) rate as well as having concentrated ownership patterns. Therefore, the positive relationship between profitability and leverage suggested by tax and agency theories is not expected. The following hypothesis, consequently, is proposed:

H2 consistent with pecking order hypothesis, a negative relationship will exist between profitability and debt ratios.

5.2.3 Tangibility

It has been argue that tangibility might be the major factor in determining the firm's debt level (Titman and Wessels, 1988; Harris and Raviv, 1990 and Rajan and Zingales, 1995). It represents the effect of the collateral value of assets on the firm's leverage level. Jensen and Meckling (1976) argue that due to the conflicts between debt-holders and shareholders, debt-holders face the risk of asset substitution problem. However, if debt can be secured against assets, the borrower is restricted to using loaned funds for a specific project, and creditors have an improved guarantee of repayment. Therefore, this argument suggests a positive relationship between debt level and tangible fixed assets. However, the length of loans is likely to be matched to the length of life of assets used as collateral (matching principle). Therefore, a negative relationship between tangibility and short-term debt would be expected.

Empirically, the overall direction of this relationship supports the positive influence of tangibility on firm's leverage. However, studies using long-term

debt ratio compared to those using total debt ratio have more power in explaining the hypothesised positive relationship with 98.87% compared to 93.69% as a percentage of the total significant results. This in turn imply that the negative correlation between short-term and tangibility reducing the strength of the overall positive relationship with total debt. This is consistent with Booth et al. (2001) argument that due to conventional matching argument, the more the tangible the asset, the more the long-term debt, and the smaller the short-term debt. Moreover, Bevan and Danbolt (2002) found that tangibility is positively correlated with long-term debt but negatively correlated with short-term debt elements.

Antoniou et al. (2002) argue that importance of collateral is more significant in traditional bank lending than in borrowings from capital markets. Since banks are the debt-holder in Saudi Arabia, the importance of fixed assets expected to be more significant. Indeed, it has been stated the one of the requirement of bank to consider lending long-term debt sufficient collateral assets at least to cover 100% of the value of the loan. Accordingly, the following hypothesis is proposed:

H3a ***a positive relationship will exist between tangibility and long-term and total debt ratios.***

H3b ***due to matching principle, a negative relationship will exist between tangibility and short-term debt.***

5.2.4 Free cash flow

It has been pointed out earlier that agency theory argues that debt reduces the amount of free cash flow available to managers to undertake personally beneficial activities since it commits the firm to pay out cash (Jensen, 1986). This theory, therefore, suggests a direct relationship between free cash flow and leverage. However, if free cash flow is representing the capacity of the firm to generate internal resources, then a negative relationship between free cash flow and debt levels is expected (pecking order theory).

However, the empirical finding of previous studies analysed in chapter three reveals that the relationship between free cash flow and leverage depend on the measure of debt used. While these studies find free cash flow to be negatively correlated with total debt, a positive association is observed for long-tem debt with weak significance percentage.

It has been outlined earlier that the ownership of the Saudi firms is highly concentrated, so, the costs associated with the free cash flow suggested by agency theory will be at minimum. Accordingly, the following hypothesis is proposed:

H4 a negative relationship will exist between free cash flow and debt ratios.

5.2.5 Liquidity

It has been argued that liquidity of the firm may have an influence on the choice between internal and external financing. According to the pecking order hypothesis, firms with financial slack (i.e. liquid assets such as cash and marketable securities) will prefer internal sources to finance future

investments. Accordingly, firms with higher liquidity ratio are expected to have lower debt ratio. Empirical, studies that have examined the affect of liquidity on firm's leverage seem to support the existence of the negative relationship between liquidity and debt in which 99.12% of the significant results are negative. Accordingly, the following hypothesis is proposed:

H5 a negative relationship will exist between liquidity and debt ratios.

5.2.6 Uniqueness

Titman (1984) argues that firms characterized by unique products impose potential costs on their customers, input suppliers, and workers when facing liquidation and so they should be financed with relatively less debt. These firms also find it difficult to borrow because their specific use of capital reduces the probability of an alternative use in the event of bankruptcy. Such firms are expected to spend more on R&D since their products are less likely to be duplicated by other firms. Furthermore, firms with relatively unique products are expected to advertise more and, in general, spend more in promoting and selling their products.

The main empirical research that has examined the influence of uniqueness on firm leverage indicates that the overall direction support the existence of the negative relationship between uniqueness and leverage. Accordingly, the following hypothesis is proposed:

H6 a negative relationship will exist between uniqueness and debt ratios.

5.2.7 Growth

Myers (1977) argues that due to the potential for under-investment, firms with great growth opportunities should not be financed with long-term debt. Myers further argues that shortening the maturity of the firm's debt obligations (i.e. increasing the use of short-term debt) can mitigate the incentive to under-investment. Empirically, it has been found that the relationship between growth and leverage to depend on how the growth is measured. While the hypothesised negative relationship between growth and debt ratios is strengthen when growth is measured by market-to-book ratio, the strength of the negative correlation decreased with growth in assets and turn into positive with growth in sales.

Antoniou et al. (2002), argue that in bank-oriented countries banks are frequently represented on the supervisory board of the companies and coordinate with the management of the firm and, thus, they are likely to be fully aware of the quality of future investment of the firm. This reduces the agency costs of debt, which in turn increases the borrowing ability of the firms. As discussed earlier, there is a multiple and strong relationship between banks and large listed Saudi firms. This relationship is reflected in the presence of the large shareholders on the banks' boards. Moreover, some banks have shares in some companies. Therefore, banks work closely with firm and know about the quality of the firm's future investment. The presence of such relationship reduces the agency cost of debt. However, companies with high growth opportunities are generally small in term of size. Therefore,

the conflicts between banks as lender and small listed and unlisted firms expected to be severe. Accordingly, the following hypothesis is proposed:

H7-a there will be a negative relationship between growth opportunity proxies and long-term and total debt ratios in both listed and unlisted samples.

H7-b there will be a positive relationship between growth opportunity proxies and short-term debt in both listed and unlisted samples.

5.2.8 Dividends

One of the main predictions of the pecking order hypothesis is that higher dividend payouts lower retained earnings and that increases the need for debt to finance growth opportunities. This in turn suggests a direct relationship between dividends and debt ratios. On the other hand, dividends can control the free cash flow agency problem as higher dividends lower the amount of free cash flow (Stulz, 1990). This in turn suggests a negative relationship between dividends and debt ratios.

As with growth, the analysis of prior empirical studies reveals that the relationship between dividends and leverage depends on how the dividends is measured. While a negative relationship between dividends and debt ratios is found with the dividend payout ratio, a positive correlation is observed when dividends are measured by dividend yield.

However, La Porta et al. (1999) argue that paying dividends in the developing countries is a sign of commitment to the shareholders rather than to the debt holders and firms pay dividends to build the reputation to market future stock issues. This in turn suggests negative relationship between dividends and debt

ratios. In previous chapter we observed that the Saudi stock market plays an important role in financing listed firms via equity. Accordingly, listed firm will pay dividends to build the reputation for future external equity financing. On the other hand, since unlisted firms are constrained from stock market, unlisted firm that pay dividends will reduce the amount of retained earning and, thus increase the need for debt. Accordingly, the following hypothesises are proposed:

H8-a ***due to reputation considerations, a negative relationship will exist between the dividend payout ratio and debt ratios in listed sample.***

H8-b ***a positive relationship will exist between the dividend payout ratio and debt ratios in unlisted sample.***

5.2.9 Age

It has been argued that young firms are more likely to depend on debt instruments since they do not have sufficient internally funds to finance new investment. This in turn suggests negative correlation between age and leverage. On the other hand, aged firms have established a good relation with banks and form good reputation through time. Accordingly, they have better conditions and easier access to debt market than those new established.

The analysis of prior empirical studies shows that the relationship between age and debt ratios to depend on how debt is measured. While age is found positively correlated with total debt ratio, it is found negatively associated with long-term debt ratio. This in turn implies that age is positively correlated

with short-term debt. In line with the prior studies findings, the following hypotheses are proposed:

H9 -a ***a positive relationship will exist between age and short-term debt and total debt.***

H9 -b ***a negative relationship will exist between age and long-term debt.***

5.2.10 Business risk

It has been commonly argued in the literature that as debt involves commitment of periodic payments, firms with high variability in earnings have a greater risk not to meet their debt obligations, so increasing the probability of default. Thus, lenders will be less willing to lend or will charge a higher risk premium since they will have a greater probability of losing their money. Empirically, the analysis of prior studies shows that risk is significantly inversely correlated with debt ratios.

Since Saudi banks are conservative in their lending policy, one would expect that banks are unwilling to lend to firm with high volatility in earnings. Therefore, the following hypothesis is proposed:

H10 ***a negative relationship will exist between volatility in earnings as proxy for risk and debt ratios.***

5.2.11 Government ownership

In light of agency theory associated with debt benefits, shareholders owning large percentages of equity shares (particularly institutions) could prevent management from engaging in self-interest activities by reducing the free cash

flow through increasing the firm's debt. Moreover, government-linked firms have several advantages such as easier access to alternative source of finance and guaranteed solvency (Deesomsak, Paudyal and Pescetto, 2004). These arguments suggest a positive relationship between share held by government and leverage. On the other hand, agency theory associated with debt benefits argues that government as large external shareholders may also force managers to engage in activities that benefit shareholders at the expense of debt-holders such as asset substitution (Myers, 1977). This in turn suggests negative relationship between shares held by government and leverage. Empirically, the analysis of prior studies reveals that government is negatively correlated with debt ratios based on book value, but insignificantly correlated with debt ratios based on market value.

However, it has pointed out in previous chapter that the government has the majority ownership in several key companies in the Saudi stock market, which in turn make it the second largest shareholders in terms of market capitalisation. Also, it was also stated that one of the privatisation themes is equity financing for state companies due to government budgetary deficits. This in turn implies that government-link firms will rely on equity rather than on debt. Accordingly, the following hypothesis is proposed:

H11 a negative relationship will exist between the government ownership and debt ratios.

5.2.12 Industry classification

The industry in which a firm operates will have a significant effect on its capital structure. Bradley et al (1984) found that firms belonging to the same

industry generally have similar financial structures whereas firms from different industry classes generally have different financial structures. Moreover, Harris and Raviv (1991) noted that Drugs, Instruments, Electronics and Food have low leverage whilst Paper, Textiles, Mill Products, Steel, Airlines and Cement have high leverage. The authors also note that utilities firms are more leveraged than non-utilities firms.

It has been pointed out earlier that Saudi companies are belonging to seven sectors. Besides the banking sector, industrial, telecommunication, electricity, cement, services and agriculture are the major sectors as defined by Saudi Stock Market. Manufacturing and cement firms, expected to have intensive fixed assets, are likely to use more debt than farming and the service sector. This in turn leads to the following hypothesis:

H12 firms operating in the manufacturing and cement industries will show higher debt levels than those operating in farming and service industries.

5.3 Leverage definitions

In the literature of capital structure, there is no clear-cut definition of leverage. Rajan and Zingales (1995) apply four different measures for leverage. The first definition of leverage is the ratio of total (non-equity) liabilities to total assets. A second one is the ratio of debt (both short-term and long-term) to total assets. Third is the ratio of total debt to net assets, where net assets are total assets less accounts payable and other current liabilities. The final definition is the ratio of total debt to capital, where capital is defined as total debt plus equity.

Three debt ratios will be used as dependent variables to test the determinants of capital structure of Saudi firms. These are: total debt, short-term debt and long-term debt all scaled by book value of total assets. There are several reasons for selecting these measures. First, it is necessary to find out the determinants of the use of the firms' general level of leverage (i.e. total debt). Second, if any leverage is used, we need to know what determines the mix of long-term debt and short-term debt for financing asset growth. Our understanding goes first to the matching principle where long-term debt is used to finance fixed assets and short-term debt is used to finance working capital. However, prior empirical studies demonstrated that other factors determine the choice of debt maturity such as barriers to access to capital market, the development of bond market, size and profitability of the firms. Bevan and Danbolt (2002) find significant differences in the determinants of long-term and short-term debt ratios.

Moreover, Titman and Wessels (1988) argue that the coefficients' signs, magnitudes and even levels of significance of the explanatory variables will differ according to whether the debt ratios are defined in terms of book or market values. However, the book values of debt are used in this dissertation for the following reasons:

Taking into account the scarcity of data, book values of debt data are usually available.

Titman and Wessels (1988) argue that the correlation between book and market of debt is very large, thus, the misspecification due to using book value measures is probably fairly small.

Due to the weakness of the primary bond market and the non-existence of secondary bond market in Saudi Arabia, bonds are never tradable in secondary market, which means there is no market value of debt.

Since bank loans are the dominant source of corporate debt, banks require fixed assets as collateral, which usually priced at book value.

Managers consider the book value of their firm when making debt decisions.

Zakat (tax) department considers book values in its regulations and proceedings.

5.4 Explanatory Variables definitions

5.4.1 Size

Generally, logarithm of sales, logarithm of assets and number of employees are the variables that have been used in empirical studies to capture the affect of size on leverage. Based on prior studies included in the synthesis analysis conducted in chapter three, logarithm of assets appears to come first with 266 out of 488 using the three proxies to capture the effect of size followed by logarithm of sales with 210 and only 12 uses the number of employees. Although all the three proxies show the expected positive influence of size on leverage, they have different explanatory power. While using logarithm of assets and logarithm of sales has demonstrated about the same strong results, using number of employees shows relatively moderate results.

Accordingly, the logarithm of assets will be employed as the main proxy for size in this dissertation to capture the influence of size on leverage and logarithm of sales as an alternative proxy.

5.4.2 Tangibility

Fixed assets to total assets is the common proxy most studies used to capture the effect of tangibility on leverage. However, different authors have used different measures for the concept of collateral value of assets. Most studies (e.g. Marsh, 1982; Friend and Lang, 1988; Rajan and Zingales, 1995; Bevan and Danbolt, 2002 and 2004) employ the ratio of fixed assets to total assets. Titman and Wessels (1988), however, add inventory to the fixed assets. The main argument behind adding inventory is that debts are used partly to finance inventories, and in most cases inventories maintain some value when the firm is liquidated.

In line with the majority, the ratio of fixed assets to total asset will be the main proxy for tangibility in this dissertation and the fixed assets and inventories to total assets will be the alternative proxy.

5.4.3 Profitability

Generally, there are two proxies employed in prior empirical studies to serve as bases for the measure of profitability. These are return on assets (ROA) and return on sales (ROS). The most common proxy found in the synthesis analysis of prior studies is return on assets with 449 compared to 62 using return on sales. However, the results of both proxies provide strong support to pecking order hypothesis as both proxies show strong negative influence on debt ratios.

In lines with most studies, return on assets defined, as the ratio of earnings before interest, tax and depreciation (EBITDA) over total assets will be used

as the main proxy to capture the influence of profitability on leverage. The return on sales, on the other hand, will be used as an alternative proxy.

5.4.4 Free cash flow

To capture the effects of free cash flow most studies (e.g. Opler and Titman 1993; Lasfer; 1995 and DeMiguel and Pindado, 2001) define free cash flow as interaction between cash flow expressed as the earnings before interest and tax plus depreciation normalised by total assets and Tobin's q which is the market value of the firm to the replacement cost of its capital.

However, due to the lack of market value data for unlisted firms, the free cash flow defined as the earnings before interest and tax plus depreciation less capital expenditure (i.e. positive growth in fixed assets) normalised by total assets will be the proxy used to capture the free cash flow's influence on leverage.

5.4.5 Liquidity

The ratio of current assets over current liabilities is the common proxy that has been used by previous empirical studies to capture the influence of liquidity on leverage. In this dissertation, however, the quick ratio (current assets less inventory over current liabilities) will be used as the main proxy for liquidity since it focuses on the firm's more liquid assets. The current ratio, on the other hand, will be used as an alternative proxy.

5.4.6 Uniqueness

In order to capture the influence of uniqueness on capital structure, two measures have been employed in the empirical studies, namely, the ratio of R&D to sales and the ratio of selling expenses to sales. The most common proxy found in the synthesis analysis of prior studies is the ratio of R&D to sales with 66 compared to 28 using the ratio of selling expenses to sales. However, the results of both proxies provide strong support to Titman's argument as both measures show strong negative influence on debt ratios.

However, due to the lack of R&D data, the ratio of selling expenses to sales will be used as the main proxy for uniqueness. Moreover, dummy variable equal to one for firms reporting selling expenses and zero other wise will be used as an alternative proxy[14].

5.4.7 Growth

Different proxies have been employed to capture the influence of growth opportunities on leverage. These are the ratio of market value of assets to book value of assets (market-to-book ratio), past growth in sales and past growth in assets. The most common used proxy found in the synthesis analysis of prior studies is market-to-book ratio with 350 compared to 63 and 60 using past growth in sales and past growth in assets respectively. Generally, the market-to-book ratio defines as the ratio of book value of total assets less the book value of equity plus the market value of equity to the book value of total assets.

[14] This proxy for uniqueness is less than ideal since it is not possible to distinguish between firms that have zero selling expenses and those that have non-zero selling expenses but fail to report them separately.

Since the study involves listed and unlisted samples, two different measures will be employed in this dissertation to capture effect of growth opportunities on leverage. The market-to-book ratio value of assets (only for listed firm) and the growth in assets (unlisted sample) will be used as the main proxies for growth opportunities. Moreover, growth in sales (for unlisted sample) and both growth in assets and in sales (for listed sample) will be used as alternative proxies.

5.4.8 Dividends

Dividend payout ratio and to a lesser extent dividend yield are used in prior studies to capture the impact of dividends on the firm's capital structure. However, the results of meta-analysis reveal that the two measures produce differing directions. While dividend payout ratio shows overall negative affect on leverage, dividend yield proxy reveals overall positive influence.

Nevertheless, to investigate the influence of dividends on debt ratio, only dividend payout ratio will be employed here due to the lack of data concerning dividend yields. Additionally, a dummy variable equal to one for firms paying dividends and zero otherwise will be used as an alternative proxy.

5.4.9 Age

The number of years since the year of the firm's establishment is the common proxy used to capture the influence of age on leverage. The overall results of this proxy show a positive impact on leverage. However, to improve the linear relationship with debt ratios, the natural log of the number of years since

company's establishment will be used as the main proxy for age in this dissertation and the number of years as alternative proxy.

5.4.10 Risk

Two proxies have been used to capture the influence of risk on leverage, namely, earnings volatility measured as the standard deviation of the first difference in annual earnings over mean of annual earnings and systematic risk (β). However, the most common used proxy found in the synthesis analysis of prior studies is earnings volatility with 253 compared to only 10 using systematic risk. In general, the results of both measures reveal the desire negative impact of risk on leverage that indicates riskier firms have lower debt ratios.

Due to the lack of data related to systematic risk, the ratio of the standard deviation of first difference in annual earnings to the mean of annual earnings over the study period will be employed in this dissertation as a proxy variable for business risk.

5.4.11 Government ownership:

To capture the effect of the existence of government as a shareholder on firm's capital structure, most of the studies included in the meta-analysis use a dummy variable equal to one for firms having shares held by government and zero other wise. One study, however, uses the actual percentage of outstanding shares held by the government. The major issue of using a dummy variable is that it ignores the high variation between the companies that report a positive data of the variable of interest. For example, company

with 70% of ownership held by the government is treated equally as the company with 2% of ownership.

In this dissertation, since this issue is observed in the sample, the actual percentage of shares held by the government will be use to measure the effect of the presence of government on leverage.

5.4.12 Industry classifications:

Titman and Wessels (1988) employed a dummy variable equal to one for firms producing machines and equipment and zero otherwise to measure the influence of industry classification on leverage. Other researchers, however, included more than one dummy variable to capture the differences in the leverage ratios among different industries class.

To investigate if capital structure varies among industry sectors, this dissertation will employ three dummy variables representing manufacture, cement and farming sectors in listed sample and two dummy variables representing manufacture and farming sectors in unlisted sample with the service sector being the base in both samples. Banking sector, however, is excluded since their balance sheets have a significantly different structure from those of non-financial companies as well as they are the major source of debt in the country.

5.5 Conclusion

Size, profitability, tangibility, free cash flow, liquidity, uniqueness, growth opportunity, dividends, age risk, government and industry classifications are the attributes that have been identified by prior empirical studies to potentially

determine firm's debt ratio. However, De Jong et al. (2007) conclude that country-specific factors do matter in determining and affecting the leverage choice around the world and these factors should not be neglected in the analysis of a country's capital structure. Accordingly, the hypotheses about the effect of identified attributes on the firm's leverage are developed in the context of the unique institutional characteristics of Saudi Arabia. Moreover, the definition and the main proxies for these attributes as well as some alternative proxy are demonstrated in this chapter. Table 5.1 provides summary for the variables definition and hypothesised sign.

Table 5.1: **Summary of the variables definition and hypothesised sign**

Attribute	Main proxy	Alternative proxy	Hypothesised sign					
			Listed			Unlisted		
			STD	LTD	TD	STD	LTD	TD
Size	log of assets	Log of sales	+	+	+	+	+	+
Profitability	EBITDA over total assets	EBITDA over total sales	-	-	-	-	-	-
Tangibility	Fixed assets over total assets	Fixed assets & inventory over total assets	-	+	+	-	+	+
Free cash flow	(EBIT + depreciation - capital expenditure) over total assets		-	-	-	-	-	-
Liquidity	Quick ratio	Current ratio	-	-	-	-	-	-
Uniqueness	Ratio of selling expenses to assets	Dummy variables	-	+	-	-	+	-
Growth opportunities	Market-to-book ratio of equity (listed), growth in total assets (unlisted)	Growth in total sales (unlisted) and sales & assets (listed)	+	-	-	+	-	+
Dividend	Dividends payout ratio	Dividend yield	+	+	+	-	-	-
Age	Log of number of years since establishment	Number of years since establishment	-	-	-	+	+	+
Risk	Earnings volatility		-	-	-	-	-	-
Government ownership	Percentage of shares held by government		-	-	-			

Chapter 6: : Research Methods

6.1 Introduction

As discussed in chapter one, the aim of this research is to investigate the determinants of capital structure of Saudi companies. This requires that the sample selected should properly represent the population of Saudi companies. To meet this requirement, the decision was taken to extend the scope of the sample to include data for both publicly and privately limited companies (hereafter listed and unlisted companies).

Section 6.2 involves general information about the sample. Section 6.3 provides information about data collection procedure. Section 6.4 presents information about the guidelines in sample selection. Section 6.5 summarises variable calculation. Finally, sections 6.6 and 6.7 provide information about the data issues and testing procedures respectively.

6.2 Sample

Investigating both listed and unlisted companies ensured that different size companies are embodied in the sample and the companies represent the different industrial sectors in the Saudi market. The sample provides a good opportunity to investigate the effects and constraints of stock market listing (comparison of listed and unlisted companies). The data is likely to be reliable: it comes from reliable sources (i.e. ministry of commerce & industry and capital market authority) and high quality accounting standards are used for reporting.

Merely selecting firms listed on the Saudi stock market would have biased the sample towards large firms. It would also have severely reduced the sample

size. At 31 January 2006, there were eighty public listed companies[15] listed on the Saudi stock market, of which ten are banks, one is an insurance company and several companies are recent additions. The inclusion of unlisted companies enables both small and middle size firms to be investigated. According to the classification of the Ministry of Commerce in Saudi Arabia, listed companies in Saudi Arabia are the Public Limited Companies (i.e. Joint Stock Companies) that are traded on TADAWUL, the Saudi Arabia stock market. In order to be listed, each company needs to go through a two-stage admission process. First, the company has to apply to the "companies' general department" at the ministry of commerce & industry for an initial public offering. If approved then the next step is to apply to the capital market authority to be admitted for offering securities to the public and trading. Once both processes are completed, the securities are officially listed on TADAWUL. On the other hand, unlisted companies are private limited liability companies. According to the ministry of commerce & industry, the limited liability company is a company that consists of two or more shareholders liable for the company's debts to the extent of their shares in the corporate capital. However, the number of shareholders in this company shall not exceed 50 and the corporate capital of this company shall not be less than five hundred thousand Saudi Riyals. Table 6.1 summarises the differences and similarities between the listed and unlisted companies.

[15] Recently, four new companies, of which one belongs to the manufacturing sector and three are from the service sector, were listed increasing the total number to 84 listed companies.

Table 6.1: **Differences and similarities of listed and unlisted companies.**

	Form	Number of partners/shareholders	Minimum capital	Liability	Registration fee for five years
Listed Company	Joint-stock	Minimum 5 partners.	SR 10 million.	Limited to the amount contributed.	SR 8000
Unlisted Company	Limited liability	Minimum 2 partners. Maximum 50 partners.	SR 500,000	Limited to the amount contributed.	SR 6000

Source of data: The Ministry of Commerce and Industry web site (www.commerce.gov.sa)

6.2.1 Sources of data

Unlike developed countries, for Saudi Arabia there is no readily available computerised database such as Datastream or Compustat. Datastream has data for just one Saudi Arabian company (SABIC). However, there are three governmental sources that maintain financial statements of Saudi companies as hard copies. The Capital Market Authority has financial statements of all publicly listed Saudi companies and these statements are available to the public. The other two governmental sources are the Ministry of Commerce and the Ministry of Finance represented by the "companies' general department" and the "department of zakat and income tax" respectively. While the "department of zakat and income tax" maintains all the financial statements of all types of companies, the "companies' general department" maintains only the financial statements of the publicly listed and privately unlisted companies[16]. However, accesses to these data are not available publicly. When requested, access to the "department of zakat and income tax" data was refused. Access to the "companies' general department" data was

[16] Since both are limited liability companies, they are required by the Companies' Act to submit their financial statements to the "companies' general department" annually.

granted subject to the receipt of letters from my supervisor and my sponsor in Saudi Arabia explaining the nature and the purpose of the study. Given the now stated sources of data, the next section provides general information about the sources and their credibility.

6.2.1.1 Capital Market Authority

The history of the official Saudi stock market dates back only to 1985, which means that it is still in its early stage of development. However, its growth in recent years has led the Saudi government to release new legislation governing the stock market. In 2003, Royal Decree M30 (the Capital Market Law) approved the establishment of the Capital Market Authority (CMA). This newly established authority is a government organization with financial, legal and administrative independence, which reports directly to the Prime Minister.

The authority has broad responsibilities for organizing and developing the stock market. Since its establishment, CMA has been keen to create an appropriate investment environment. It has issued a number of implementing regulations to improve transparency and discipline levels. CMA sets specific and defined criteria for approving listed companies' requests to raise capital. In particular, it requires that firms issue a prospectus containing detailed information on the new issuance, a directors' report, fully audited financial statements, and other related issues. Moreover, publicly listed firms are required to announce any material events that take place such as the acquisition or the disposition of significant amounts of assets. It is also noteworthy that CMA requires listed firms to submit to the authority quarterly

and annual reports on a timely basis; annual reports must be audited as required by the rules of the authority.

To implement its regulations, the authority imposes strict punishments and monetary fines on companies that do not follow the disclosure regulations. For example, according to the CMA official site, the authority stopped the trading of "Al Baha Investment & Development Co." from April 6, 2005 through July 14, 2005 because the company had not released its financial statements for the year 2003.

6.2.1.2 Companies General Department

Although the Companies Act was issued by Royal Decree M6 in 1965, the history of the Companies General Department starts in 1982 when the Royal Decree M23 amended the Companies' Act and approved the establishment of this department. It operates under the supervision of the deputy minister of internal trade as the figure demonstrates in Appendix 3. According to the ministry of commerce and industry official web site, the department is responsible for the implementation of the provisions of the Companies Act including administrations of:

1. Joint stock companies.
2. Limited liabilities companies.
3. Sole proprietorship companies.
4. Foreign companies' admission.
5. Companies' follow-up.

6. Professional companies.

7. Communication.

8. Archives.

As can be inferred from the above, the department has wide responsibilities. One of its main duties is to ensure companies' compliance with the Companies Act. Article 89 of the act covers disclosure and states that the Chairman of the Board of a public limited company is required to release to the public in the newspaper the financial statements audited in accordance with the accounting and auditing standards released by the Saudi Organization for Certified Public Accountants (SOCPA). In addition, the issue of the newspaper that has the publication of the financial statements combined with copies of the management report and the report of the independent licensed auditor must be submitted to the companies' general department, at least, 25 days before the shareholders' general meeting. Article 175, on the other hand, requires the managers of a *private* limited company to submit to the companies' general department copies of financial statements audited in accordance with the accounting and auditing standards released by SOCPA. The management report and the report of the independent licensed auditor copies, however, should be submitted to the department within six months of the ending of the accounting year.

Overall, the fact that the capital market authority imposes strict disclosure and transparency regulations on publicly listed firms and that publicly and privately limited liability companies are legally required to submit audited

financial statements to the companies' general department enhances the credibility of these sources and the reliability of the data.

6.2.2 Accounting standards and data reliability

The accounting profession in Saudi Arabia has two main characteristics. First, the government has been supporting a policy of continuous improvement. According to the SOCPA official site, before the discovery of oil in 1938 there was little demand for auditing in the Kingdom and indeed it was not until 1965 that the Companies Act introduced specific requirements for company audit. However, the first law that regulated the auditing profession in Saudi Arabia was the Law of Certified Accountants, promulgated in 1974 by Royal Decree 43. In 1986, Ministerial Resolution 692 approved the objectives and concepts of financial reporting and the standards of presentation and disclosure as guidelines for all CPAs.

The professional accounting body that is responsible for the development of the accounting and auditing profession in Saudi Arabia, SOCPA, was established in 1991 under Royal Decree M12. It operates under the supervision of the Ministry of Commerce. Since its establishment, SOCPA has been seeking to develop the accounting profession through its objectives that include:

1. Review, develop and approve accounting and auditing standards.

2. Monitoring the performance of certified public accountants to ensure their compliance with accounting and auditing standards and with the provisions of CPA Regulations.

3. Establish SOCPA fellowship examination.

4. Conduct research and studies; publish periodicals, books and bulletins covering accounting and auditing subjects; and participating in local and international committees and conferences relating to the profession of accounting and auditing.

The second characteristic of the accounting profession in Saudi Arabia is its compatibility with the Saudi economic environment. According to the SOCPA official site, Saudi accounting standards are in general consistent with international accounting standards except for certain differences to adopt the economic and legal developments in the country. The five-year Saudi Development Plans (Ministry of Planning, 1990, 1995, 2000) concentrated on the government's intention to privatise the state-owned enterprises, coupled with the release of the capital market law, recognising the need to improve the audit profession. Since, its beginning, SOCPA has been actively issuing a series of accounting and auditing standards through its specialised committees. As of November 2006, SOCPA has released 17 accounting and 14 auditing standards (According to the SOCPA official site). As recognition of its works and its credibility, recently SOCPA has become a member of the International Federation of Accountants (IFAC).

Overall, the establishment of SOCPA combined with the release of the Capital Market Law have enhanced the quality and the credibility of the accounting profession in Saudi Arabia. Moreover, the fact that firms included in the sample are legally required to use accounting standards released by SOCPA for reporting and auditing give the data the required reliability.

6.3 Data collection procedure

6.3.1 Initial sample

The fieldwork took place from the end of September of 2005 to the end of January of 2006 with another visit in March 2006 to check for those companies with incomplete records. The first step was constructing the list of the initial sample that should include information about all listed and unlisted companies. The initial list of listed companies was constructed based on the information maintained in TADAWUL web site. This particular web site provides updated information about the companies' symbol, long name, short name and acronym. This procedure identified 80 companies that represent all companies listed on Saudi stock market at the end of January 2006 (as the table demonstrates in Appendix 3). Eleven financial companies were dropped from the initial list of listed firms (10 are banks and one is insurance company) as their balance sheets have a significantly different structure from those of non-financial companies.

For unlisted companies, the initial list of 8143 companies was constructed based on the information provided in the commercial registration directory run by the archive division at the companies' general department. This directory provides information about companies' names, addresses, commercial record, and file numbers in the archive for all the companies in the country.

6.3.2 Industry classification process

Listed companies were classified into eight sectors using the Saudi Stock Market industry classification codes in TADAWUL. Table 6.2 shows the

manufacturing sector to be largest with 37.5%, followed by the service sector with 23.8%. The electricity and insurance sectors are small with just one company in each.

Unlike the classification of listed firms, there are no specific codes identifying the industry sectors of unlisted firms. The archive division classifies companies into three industrial sectors; namely, manufacturing, service and agriculture sectors, so the Saudi Stock Market industry classification codes for manufacturing, service and agriculture sectors were used. As Table 6.2 shows, the service sector is by for the largest at 65.0%, followed by the manufacturing sector at 34.7%, and only with 0.3% for agriculture.

Table 6.2: **Saudi Stock Market industry classification codes assigned.**

Sector	Sector classification code	Listed		Unlisted	
		Number of companies	%	Number of companies	%
Banking	10s	10	12.5		
Manufacturing	20s	30	37.5	2824	34.7
Cement	30s	8	10.0		
Service	40s	19	23.8	5298	65. 0
Electricity	51	1	1.2		
Agriculture	60s	9	11.3	21	0. 3
Telecommunication	70s	2	2.5		
Insurance	80s	1	1.2		
Total		80	100	8143	100

Source: TADAWUL web site (www.tadawul.com.sa) and the Companies General Department.

6.3.3 Collecting process

Hard copies of the financial statements were collected from the Capital Market Authority. Three missing sets of financial statements were obtained from the "companies' general department" (2 sets) and directly from the company (one set). For unlisted companies, all the financial statements were obtained from the "companies' general department" at the ministry of

commerce. This task was very time-consuming, given the large number of companies the archive maintained and the extensive need for hand searching for data. The financial statements for companies having a complete set of data were scanned at the rate of approximately seven companies per day on average. The data was finally entered manually into an Excel spreadsheet at a later stage.

6.3.4 Difficulties faced during data collection process

While the people at the companies' general department were very helpful, the task of data collection proved difficult:

1. Two files are maintained for each company (financial statements and contracts and official letters) but documents were sometimes incorrectly filed.

2. Files for companies with missing data (e.g. closed companies) were shelved together with other files.

3. The company directory was out of date, since many firms that had closed down had not informed the department.

6.4 Guidelines in sample selection

Companies without complete data for the whole period under study (i.e. 2000 to 2004) were excluded. For listed companies, the new eight companies were excluded as well as the Saudi electric company, which resulted from the merger in 2002 between the ten electricity companies working in the country.

For unlisted companies, it was found that data for the majority of companies was incomplete mainly because of the following:

1. Companies had missing data in a particular year (3045 companies).
2. Companies were new companies (2912 companies).
3. Companies had closed down (1783 companies).

Unfortunately, this drastically reduced the sample available for analysis. To summarise, the guidelines for selection of the sample of firms were as follows:

1. Only listed and unlisted companies with limited liabilities were included.
2. Only non-financial companies were included.
3. Only companies with complete financial information over the whole period under study were included.

Table 6.3 summaries the sample decomposition of the companies selected for this study.

Table 6.3: **Sample selection process**

Sector	Banking	Manuf.	Service	Cement	Elect.	Agric.	Telec.	Insu.	Total
Listed companies									
Initial sample	10	30	20	8	1	9	1	1	80
Less Bank& Insurance	(10)							(1)	11
Less new		(5)	(3)						8
Less incomplete data					(1)				1
Final dataset	0	25	17	8	0	9	1	0	60
Unlisted companies									
Initial sample		2824	5298			21			8143
Less incomplete data		(1326)	(1716)			(3)			(3045)
Less new		(1077)	(1835)						(2912)
Less closed down		(302)	(1479)			(2)			(1783)
Final dataset		119	268			16			403

The following items were hand-collected from the financial statements for each company for each 5 years 2000-2004:

a. 13 items from the balance sheet.

b. 7 items from the income statements.

c. 2 from the cash flow statements.

d. 2 general items

e. Two further items were collected for listed companies.

Overall, 7,800 (48,360) observations were collected for listed (unlisted) companies making 56,160 in total.

6.5 Variables calculation

The variables calculation was based on the variable definitions provided in previous chapter. The short-term, long-term and total debt dependent variables are used in the present study. The dependent variables use the book value of the firm's debt because they are in the form of bank loans. There are 13 (11) explanatory variables for listed (unlisted) firms that have been identified as potential determinants of capital structure. Moreover, some of these variables have alternative proxies.

Table 6.4 summaries the calculation process of the selected dependents and independents variables including *alternative* proxies.

Table 6.4: **Summary of the variables calculation**

Variable	Proxies
Dependent variables	
STD	(Bank borrowing repayable in less than one year) / Total assets
LTD	(Bank borrowing repayable in more than one year) / Total assets
TD	((STD) + (LTD)) / Total assets
Independent variables	
SIZE	Log (total sales)
SIZE	*Log (total assets)*
PROFT	EBITDA / Total assets
PROFT	EBITDA */ Total sales*
TANG	Fixed assets / Total assets
TANG	*(Fixed assets + inventory) / Total assets*
M / B	(Total assets - Book Value of Equity + Market value of Equity at the end of each accounting year) / Total assets
G. SALES	(Total sales$_t$ – Total sales$_{t-1}$) / Total sales$_{t-1}$
G.ASSETS	(Total assets$_t$ – Total assets$_{t-1}$) / Total assets$_{t-1}$
RISK	SD (Net income$_t$ - Net income$_{t-1}$) / Mean of Net income
DIV	Dividends paid / Net income
DIVDUM	*Dummy variables, 1 if company paid dividends and zero otherwise*
FCF	(EBIT + depreciation - capital expenditure)/TA
CR	Current ratio = current assets / current liabilities
QR	*Quick ratio = (current assets – inventory) / current liabilities*
UNIQ	Sales & marketing expenses / Total assets
UNIQDUM	*Dummy variables, 1 if company report Sales & marketing expenses and zero otherwise*
AGE	Number of years since the company was founded
LOGAGE	*Log (age)*
GOV	% of outstanding shares owned by government
GOVDUM	*Dummy variables, 1 if government hold shares in company and zero otherwise*
MINDUM	Dummy variables, 1 if the company is belong to manufacturing sector and zero otherwise
FARMDUM	Dummy variables, 1 if the company is belong to agriculture sector and zero otherwise
CEMEDUM	Dummy variables, 1 if the company is belong to cement sector and zero otherwise

6.6 Data issues

The fact that the data, in this dissertation, is a cross-section of firms raises concerns about the existence of heteroscedasticity. Pindyck and Rubinfeld (1998) state that *"There are occasions in econometric modeling when the assumption of constant error variance, or homoscedasticity, is unreasonable. For example if one is examining a cross section of firms in one industry, error terms associated with large firms might have larger variance than those error terms associated with smaller firms…"*(p. 146). Moreover, it probably arises when there is a wide range to the *X* variables, and when using grouped data, in which each observation is an average for a group and the groups are of different sizes (Greene, 2000). In the presence of such problem, the OLS parameter estimators are still unbiased and consistent, but are inefficient (not BLUE). This means that the variances of the estimated parameters are not the minimum variances. Further, the estimated variances of the estimated parameters will be biased estimators of the true variance of the estimated parameters.

Another issue concerns the limited dependent variable in which the dependent variable (the level of debt) can take values between zero and one. Maddala (1983) argues that this problem occurs when dependent variables are limited in their range because of some choice mechanism. In this dissertation, the dependent variable is defined as the book value of debt (total, long or short term) divided by the book value of total assets. Thus, the values of the

dependent variable are generally constrained within the range of zero to one though this value can exceed one in extreme cases[17].

The existence of the lower limit (i.e. zero) and the upper limit (i.e. one) means that any results obtained from a regression model that are outside these limits are illogical. Maddala (1983) demonstrates that if an OLS estimator is used with a limited dependent variable, the residual will be correlated with the explanatory variables and, thus, the estimated parameters will be inconsistent and downward-biased (i.e. underestimate the true effect). Greene (2000) argues that such limits may cause the error term in an OLS regression to be heteroscedastic and the estimate will be biased toward zero. Generally, studies have dealt with this issue by using the estimation technique known as Tobit model. This model excludes the lower range of values (left truncation), upper range of values (right truncation), or both from the sample and, thus, it will produce slopes and standard errors that are less biased and more efficient than those obtained from OLS regression. In the framework of capital structure empirical studies, however, Rajan and Zingales (1995) and Bevan and Danbolt (2002) found that censored Tobit results are extremely similar to those obtained by employing OLS technique.

Another common issue is when the data contain outlier observations. The outliers are the data points that are more than an arbitrary distance from the regression line (Pindyck and Rubinfeld, 1998). In another words, they are the data points that deviate from the rest of the data. In the presence of outliers,

[17] This occurs when the company's cumulative loss exceeds its capital. In this study, three unlisted companies reached this circumstance. However, according to article (180) of companies Act, the shareholders must provide financial guarantee letter that includes the shareholders commitment to pay the company's debt if they decide to continue the business.

OLS estimation is inefficient and can be biased because its estimates are dragged towards the outliers, and because the variance of the estimates is artificially inflated. As is the case in most data, some outliers will be expected in the present study.

6.7 Testing procedure

This section outlines testing procedures designed to test the data and the hypotheses using techniques that take the above issues into account.

6.7.1 Data testing

The data testing is divided into two parts. The first pre-estimation procedure seeks to ensure the data is clean from outliers. The box plot based on 5 (inter-quartile range) will be used to identify outliers in this dissertation due to the wide variation in the samples.

The second part is post-estimation procedure, the objective of which is to ensure the estimation robustness. One instance in which robust estimation should be considered is when there is a strong suspicion of heteroscedasticity. To test for heteroscedasticity, The Breusch-Pagan/Godfrey test was used. In the presences of the heteroscedasticity, the White's (1980) correction for heteroscedasticity was followed. Moreover, beside the correlation matrix, Variance Inflation Factor was used to test for multicollinearity. DFITS was employed to identify influential observations.

6.7.2 Hypotheses test

The aim of this part is to investigate the theory and empirically suggested determinates of capital structure for both listed and unlisted companies. Although the capital structure literature provides information about the variables that influence capital structure and the nature of the influence, there is no certain model that can appropriately formulate the relationship. However, the majority of empirical analyses use a model in which debt ratio is regressed on a list of explanatory variables.

Moreover, empirical analysis has traditionally used different types of data analysis, namely, pure time-series, pure cross-sectional, pooled and panel. However, few studies have been found in the literature to implement more than one type of analysis. In their work, Bevan and Danbolt (2004) found significant differences in the results obtained by employing pooled OLS from those obtained by using panel analysis, in particular, fixed effects estimation. Therefore, it is worth to investigate to what extent the results are sensitive to the changes in the estimation based on data types. To extend Bevan and Danbolt's (2004) work, the analysis will be extended to involve also pure time-series and pure cross-sectional data regression analyses.

Moreover, to test the hypotheses that previously developed in chapter 4, there are two general estimated models. The first one is examining the relationship between the debt ratios and capital structure determinants for listed firms. The second is examining the relationship between the debt ratios and capital structure determinants for unlisted firms.

6.7.2.1 Pooled time-series and cross-sectional analysis

Generally, comparison studies start first with pooled regression. This model has a single overall intercept term (α) and coefficient estimates are based on variation between firms and over time. Accordingly, the estimated equations are as follow:

Listed

$$\text{Leverage}_{i,t} = \alpha + \beta_1 \text{SIZE}_{i,t} + \beta_2 \text{PROFT}_{i,t} + \beta_3 \text{TANG}_{i,t} + \beta_4 \text{M/B}_{i,t} + \beta_5 \text{RISK}_{i,04} + \beta_6 \text{DIV}_{i,t} + \beta_7 \text{FCF}_{i,t} + \beta_8 \text{CR}_{i,t} + \beta_9 \text{UNIQ}_{i,t} + \beta_{10} \text{AGE}_{i,t} + \beta_{11} \text{GOV.}_{i,t} + \beta_{12} \text{MINDUM} + \beta_{13} \text{FARMDUM} + \beta_{14} \text{CEMEDUM} + \varepsilon_{i,t}$$

$$\text{Unlisted Leverage}_{i,t} = \alpha + \beta_1 \text{SIZE}_{i,t} + \beta_2 \text{PROFT}_{i,t} + \beta_3 \text{TANG}_{i,t} + \beta_4 \text{G. Sales}_{i,t} + \beta_5 \text{RISK}_{i,04} + \beta_6 \text{DIV}_{i,t} + \beta_7 \text{FCF}_{i,t} + \beta_8 \text{CR}_{i,t} + \beta_9 \text{UNIQ}_{i,t} + \beta_{10} \text{AGE}_{i,t} + \beta_{11} \text{MINDUM} + \beta_{12} \text{FARMDUM} + \varepsilon_{i,t}$$

Where i denote the individual firms, t refers to the time period (i.e. from 2000 to 2004). Moreover, leverage refers to each of the leverage measures (i.e. total debt to total assets, short-term debt to total assets, and long-term debt to total assets). Due to its construction, risk proxy refers to year 2004.

It is important to note that there is only one company from the telecommunication sector in the listed sample. Due to the nature of its business, it is included with the service sector. In both samples, the service sector is selected as the base because it constitutes the largest sector in the unlisted sample and the second largest in listed sample; it is also expected to be the one with lower levels of debt. Moreover, in unlisted sample regression

GOV and CEMEDUM variables are excluded since there were no unlisted government-linked and cement companies included in the sample.

However, one issue associated with pooled analysis is that firms in the sample are included more than once over study period. This in turn may potentially overstate t-statistics (Barclay et al, 1995 and Bevan and Danbolt, 2004).

6.7.2.2 Cross-sectional data analysis

In pure average cross-sectional estimation, the two equations of the listed and the unlisted sample will be also estimated for the three debt elements. The regression estimation includes the 2004 debt level as dependent variable and the explanatory variables are four year average (2000-2003) except risk proxy. This process will produce more robust estimation since lagging will reduce the potential reverse causality between dependent and explanatory variables while averaging will reduce the effect of fluctuation in the explanatory variables (Titman and Wessels, 1988, Rajan and Zingales, 1995 and Bevan and Danbolt, 2002). Accordingly, the estimated equations are as follow:

Listed

$$Leverage_{i,\,04} = \alpha + \beta_1\, SIZE_{i,\,t-4} + \beta_2\, PROFT_{i,\,t-4} + \beta_3\, TANG_{i,\,t-4} + \beta_4\, M/B_{i,\,t-4} + \beta_5\, RISK_{i,\,04} + \beta_6\, DIV_{i,\,t-4} + \beta_7\, FCF_{i,\,t-4} + \beta_8\, CR_{i,\,t-4} + \beta_9\, UNIQ_{i,\,t-4} + \beta_{10}\, AGE_{i,\,t-4} + \beta_{11}\, GOV._{i,\,t-4} + \beta_{12}\, MINDUM + \beta_{13}\, FARMDUM + \beta_{14}\, CEMEDUM + \varepsilon_i$$

Unlisted

$$\text{Leverage}_{i,04} = \alpha + \beta_1 \text{SIZE}_{i,t-4} + \beta_2 \text{PROFT}_{i,t-4} + \beta_3 \text{TANG}_{i,t-4} + \beta_4 \text{G. Sales}_{i,t-4} + \beta_5 \text{RISK}_{i,04} + \beta_6 \text{DIV}_{i,t-4} + \beta_7 \text{FCF}_{i,t-4} + \beta_8 \text{CR}_{i,t-4} + \beta_9 \text{UNIQ}_{i,t-4} + \beta_{10} \text{AGE}_{i,t-4} + \beta_{11} \text{MINDUM} + \beta_{12} \text{FARMDUM} + \varepsilon_i$$

Where i denote the individual firms, t-4 refers to the average for the previous four years (i.e. from 2000 to 2003). Moreover, leverage refers to each of the leverage measures (i.e. total debt to total assets, short-term debt to total assets, and long-term debt to total assets) at year 2004.

Though it reduces the effects of the dispersion across firms, averaging the sample over the period of study ignores the time effects that should be considered in the analysis. Accordingly, it is important to investigate the association between debt elements and company characteristics using panel model since it incorporates both time-series as well as cross-sectional effects.

6.7.2.3 Yearly cross-sectional estimation

To illustrate the importance of the issues associated with pooled and cross-sectional data analyses and to show the advantage of using panel data over these two analyses, it is important to run yearly cross-sectional estimation. In this analysis, the two equations of the listed and the unlisted sample are estimated for the three debt elements (i.e. short and long-term and total debts) for every year covered in this study (2000 through 2004). This process will result in estimating a total of 30 models of which 10 models are estimated for each debt element.

6.7.2.4 Panel data analysis

Two approaches may be used in panel data analysis: fixed effects or random effects. The fixed effects model includes an intercept for each firm to capture firm-specific effects and coefficient estimates reflect within-firm variation. On the other hand, the random effects model assumes firm-specific effects are random variables and models them as part of the error term and coefficient estimates are based on average variation between firms and within firms. Generally, the choice between the two approaches depends on the Hausman specification test for the random and fixed effects.

However, the panel data model, in particular the fixed effects model, has more improvements in estimation than time-series, cross-sectional and pooled models by controlling for firms heterogeneity bias. Baltagi (1995) argue that if omitted explanatory variables are correlated with explanatory variables included in the model, time-series, and cross-sectional studies not controlling for such heterogeneity run the risk of obtaining biased and inconsistent resulting estimates. Barclay et al. (1995) and Bevan and Danbolt, (2004) argue further that failure to control for time-invariant firm-specific factors may cause to observe over-estimate bias in the significance of coefficient under pooled OLS. Since fixed effects model assumes that omitted variables are constant over the time frame of study (time-invariant variables) and focus on within-firm variation, the heterogeneity bias is avoided.

Accordingly, given the potential importance for time-invariant firm-specific heterogeneity, fixed effects approach will be used in the analysis. Moreover, three explanatory variables, namely, industries dummies, government

ownership, and Risk are excluded from the estimated models. While industries dummies and government ownership variables are excluded from the estimation because they do not vary over time; the risk measure is omitted due to its construction issue.

6.7.3 Estimation technique

A number of previous studies have employed different regression techniques to estimate models: linear structural equation modelling technique (Titman and Wessels, 1988); Logit estimation procedure (Jordan et al., 1998); Tobit estimator model (Rajan and Zingales, 1995 and Bevan and Danbolt, 2002); panel-data estimation procedure (Antoniou et al., 2002 and Bevan and Danbolt, 2004) In the present study, a large number of companies had zero debt as Table 6.5 demonstrates.

Table 6.5**: summary number of dependent variable with zero value**

	STD		LTD		TD	
	No. Of cases with 0	**%**	**No. Of cases with 0**	**%**	**No. Of cases with 0**	**%**
Listed	90	30	131	44	87	29
Unlisted	789	39	1626	81	752	37

Moreover, Greene (2000, p. 924) states that the "Tobit model remains the standard approach to modelling a dependent variable that display a large cluster of limit values, usually zeros". In order to overcome the truncation issue and to retain all the desired regression properties, the Tobit estimation technique will be employed in this dissertation but not for fixed effects model.

6.8 Conclusion

This chapter presented the research method followed in this study. The sample involves data from both listed and unlisted companies. Unlike developed countries, for Saudi Arabia there is no readily available computerised database such as Datastream or Compustat. Accordingly, the data collection has been a major task in this study. The data has been hand-collected from reliable sources (i.e. ministry of commerce& industry and capital market authority). The final sample includes data for 463 companies of which 60 companies are listed and 403 companies are unlisted over the period of 2000 to 2004.

Furthermore, this chapter discussed testing procedures designed to test both the data and the hypotheses under investigation. Pre-estimation and post-estimation test procedures are followed in this study to ensure the data is clean from outliers and ensure the estimation robustness. To test the hypotheses and the sensitivity of the results, various model and estimation techniques are proposed. Cross-sectional (yearly and average), pooled and panel models will be employed in this study. To estimate these models, Tobit, OLS and fixed effects estimation techniques will be undertaken.

Chapter 7: RESULTS

7.1 Introduction

This chapter present the results of capital structure determinants in Saudi Arabia. Specifically, this chapter seeks to provide answers to the research questions in the context of the culture and institutional aspects of Saudi Arabia. The chapter starts with a detailed debt analysis. Such analysis will provide the basis for the interpretation of determinates of the capital structure of the listed and unlisted companies in Saudi Arabia.

This chapter is organised as follows: section 7.2 presents debt analysis. Section 7.3 presents the analysis of the determinants of the capital structure that includes pooled, average, yearly panel data analyses. Section 7.4 presents the alternative pro xies analysis. Section 7.5 presents robustness check. Finally, the chapter end with section 7.6 which presents the chapter conclusion.

7.2 Debt Analysis

Previous cross-country studies emphasis the importance of institutional characteristics in determining the choice between debt and equity financing. Rajan and Zingales (1995), argue that the difference between the so-called bank-oriented countries Japan, Germany, France and Italy and in the so-called market-oriented countries US, UK and Canada is reflected in the level of leverage. This part of analysis focus on debt level of listed and unlisted companies in light of the socio-cultural and institutional characteristics provided in chapter four.

In order for us to have a clear vision about the capital structure determinants in Saudi Arabia, it is very important to have a close look at the debt elements of the listed and unlisted companies. Bevan and Danbolt (2002) suggest that analyses of gearing based only upon long-term debt provide only one piece of the picture, and a fuller understanding of capital structure and its determinants requires a detailed analysis of all forms of corporate debt. Table 7.1 provides a descriptive summary of the short-term debt (STD), long-term debt (LTD), total debt (TD), and total liabilities (TL) ratios (all scaled by total assets) for listed and unlisted companies.

Table 7.1**: Summary statistics of financial ratios for listed and unlisted firms.**

Debt Type	STD	LTD	TD	TL
Panel A: Listed companies				
Mean	5.3%	5.7%	10.9%	27.2%
Median	1.5%	0.8%	4.0%	24.0%
SD	8.3%	9.5%	13.8%	16.7
Min	0.0%	0.0%	0.0%	0.05%
Max	54.4%	45.0%	57.9%	83.1%
N	60	60	60	60
Panel B: Unlisted companies				
Mean	12.9%	3.5%	16.3%	51.51%
Median	4.2%	0.0%	7%	53.24%
SD	18%	11%	21%	24%
Min	0.0%	0.0%	0.0%	0.1%
Max	102.3%	124.1%	124.1%	159.8%
N	403	403	403	403

From this table, it can be seen that Saudi listed firms generally have a lower level of total debt than unlisted firms do (10.9% for listed compared 16.3% for unlisted). However, at the disaggregate level, unlisted firms rely more havely on short-term debt (12.9% for unlisted compared to 5.3% for listed) but on substantially lower amounts of long-term debt than listed firms (5.7% for

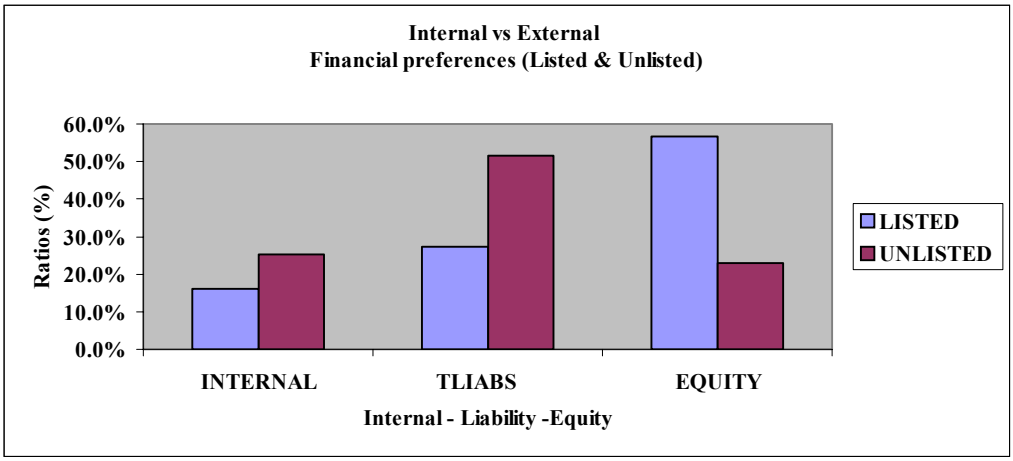
listed compared to 3.5% for unlisted). This may reflect the fact that unlisted firms are more likely to be small firms; thus, they do not have access to the capital markets and nor do they have easy access to long-term bank debt; hence, they rely on short-term debt and on their profit to finance growth.

The table further shows that total liabilities on average accounted for 27.2% and 57.5% of the total assets for listed and unlisted companies respectively. This highlights the striking differences between listed and unlisted firms in term of financing choice. The table shows that, in general, listed firm are less dependent on debt elements compared to unlisted firms. This in turn indicates that listed firm are using alternative financing instruments. Accordingly, further analysis has been carried out to determine firm's financing preference.

Figure 7.1 shows that both groups rely heavily on external rather than internal financing[18]. However, listed companies seem to finance their growth mainly by using equity with about 57%, followed by liability with about 27% and finally internally generated funds with about 16%. However, Table 7.1 shows that total debt constitutes about 11% of total assets (about 40% of total liability).

[18] The calculation method is as follow:
Internal finance = (retained earning+ provisions)/ assets
External finance (liability) = total liability/assets
External finance (equity) = 1- Internal finance - External finance (debt)

Figure 7.1**: Financial preferences**



Nevertheless, the high level of equity financing and the low level of debt financing may reflect the institutional characteristics of Saudi Arabia. It has been observed in chapter four that market capitalization has an average growth of 53.8% over the period 2000 to 2004 with the number of companies listed in the market remaining relatively constant. This implies that the market has witnessed increase in both the price and the number of shares of existing listed companies over the period. According to equity market timing consideration, firms tend to raise substantial amounts of equity capital when the equity market is perceived to be more favourable (Baker and Wurgler, 2002). Therefore, the increase in the share price reduces the cost of equity, in particular when firms perceive their shares valuations are high and, thus motivate the existing companies to raise equity, which is reflected in the high level of equity observed in the above figure.

The low level of observed debt in the listed sample can be explained also by the weak legal system and weak enforcement of the law in Saudi Arabia compared to developed countries (assuming well-developed legal systems). It

has been pointed out earlier in chapter four that bankruptcy law is more friendly to creditors, thus, banks impose costly requirements in their long-term lending policy (e.g. sufficient collateral assets at least to cover 100% of the value of the loan). This in turns increase the cost of debt. On the other hand, the lacks of enforcement of company law, individual shareholders do not have sufficient investment protection. Share capital has become somewhat a ‘‘free’’ source of finance. Moreover, it has been pointed in chapter four that corporate bond market virtually does not exist in Saudi arabia due to the constrain imposed by the company Law on the issuance of bond, which states that the total amount of bonds a company may issue to not exceed paid up capital. Such constrain keeps the issuing cost of corporate bond expensive and, thus, inhibited the popularity of such debt instrument among Saudi firms.

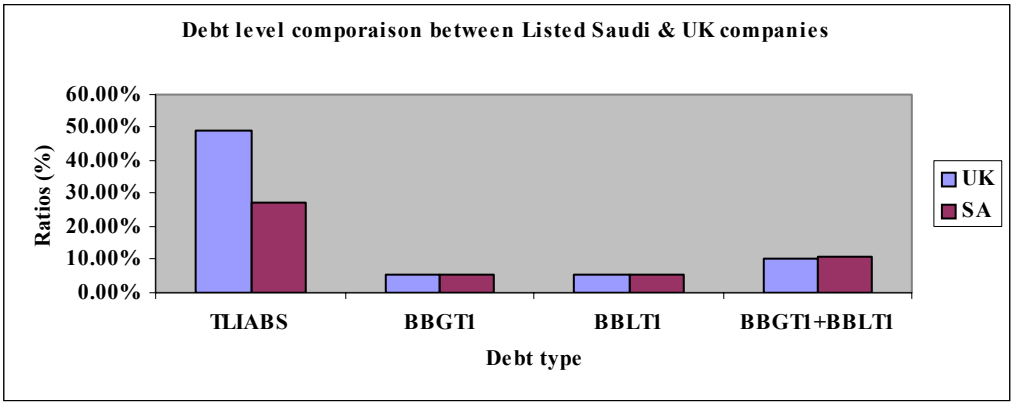
Saudi companies are also subject to pay annually zakat that is 2.5 % of the zakat base. This trivial level of tax (Zakat) makes the tax advantage of debt suggested by trade-off theory negligible. Barakat and Rao (2004) argue that, in the non-tax Arab countries (included is Saudi Arabia), the use of debt is no different from the use of equity as the payout on both is treated the same in the absence of tax advantages of debt for the corporation or tax advantage of equity for the investor. Therefore, in the absence of tax advantages of debt, Saudi firms prefer to issue the cheap equity rather than costly debt.

On the other hand, Figure 7.1 shows that unlisted companies use external finance other than equity, which is mainly total liability with about 52%, followed by internally generated funds with about 25% and finally equity with about 23%.

7.2.1 International comparison

In general, the indebtedness of Saudi companies is very low compared to the level of debt of the companies in other countries found in previous studies. If compared to the international data found in Rajan and Zingales (1995), the Saudi listed firms can be regarded as significantly under levered in term of total debt. Indeed, the 10.9% of total debt is far below the 37%, 52%, 39%, 46%, 46%, 29%, and 39% for United States, Japan Germany, France, Italy, United Kingdom, and Canada respectively. To further confirm this fact, Figure 7.2 provides a comparison between the debt level components of the Saudi listed firms and their UK counterparts based on 1997 data found in Bevan and Danbolt (2004)[19].

Figure 7.2**: Debt components comparison between Saudi listed and UK firms**



From this figure, it appears that there is a significant difference in financing preferences between Saudi and UK companies in terms of total liabilities ratio (TLIABS). While this ratio constitutes 48.94% of the total assets of UK companies, it forms 27.2% of the total assets of Saudi companies. On the

[19] These data extracted from table A1 (page, 65). BBLT1 refers to the average of bank borrowing repayable in less than one year and BBGT1 refers to the average of bank borrowing repayable in more than one year.

other hand, it can be seen that there are insignificant differences between average total bank debt (TD) of Saudi companies and the total bank barrowing (BBLT1+BBGT1) of UK companies (10.9% versus 10.5%). In term of short-term and long-term bank debt, also there are insignificant differences observed as the figure demonstrate. However, securitized debt is found to forms about 44% of the long-term debt in Bevan and Danbolt's data. Therefore, it is not surprise to observe lower long-term debt among Saudi companies since there is very weak existence for bond debt.

Since European SMEs studied by Hall et al. (2004) demonstrates almost the same average size of unlisted companies, a comparison between them is conducted. The mean of the size of Saudi unlisted firms as measured by the total assets is £19.3m, as we will see shortly in descriptive statistics, compared to the average size £19.4m of the European SMEs found in Hall et al. (2004). This implies that the majority of unlisted firms are SMEs. In terms of short-term debt, the 12.9% ratio of total assets is far below the 62.9%, 49.8%, 48.3%, 48.0%, 47.5%, 46.4%, 44.8%, and 38.2% for Italy, Spain, UK, Portugal, Ireland, Netherlands, Belgium, and Germany respectively. On the other hand, in terms of long-term debt, Saudi companies with 3.9% are second largest before Dutch companies with 2.1%, and far below German firms, the most heavily reliant on long-term debt with 28.5%.

7.3 Determinants of capital structure analysis

7.3.1 Descriptive statistics

In the previous chapter, there are 11 variables for listed firms and 10 variables for unlisted firms identified as potential determinants of capital

structure; some of these variables have alternative proxies. Table 7.2 provides summary statistics for the variables for the unlisted and listed companies respectively. All explanatory variables are detailed in terms of mean, median, maximum, and standard deviation values.

From this table, it can be seen that the original scale of the measures of size are reported to provide meaningful information. Generally, the mean value of total sales of listed firms is greater than unlisted firms by about 16 times with SAR1510.7m and SAR97.2m (about £232m and £15m) for listed and unlisted companies respectively. Similarly, the listed firms' mean value of total assets is far greater than unlisted firms by about 2700% with SAR3389.9m and SAR125.4m (about £521m and £19.3m) for listed and unlisted companies respectively. These observed information confirm the fact that listed firms are greater than unlisted firms in term of size.

Contrary to the findings for size, it seems that unlisted firms are more profitable than listed firms. On average, the EBITDA accounted for only 9.8% of the total assets of listed firms and 28.3% of the total assets of unlisted firms. However, the mean of return on sales (ROS) for unlisted companies with 26.9% is slightly higher than 26.5% for listed firms. This finding reflects the fact that the profitability measure is very sensitive to which size variables (i.e. total assets or total sales) is used as the denominator of the profitability proxy at least in this study.

Table 7.2: **Summary statistics of explanatory variables of listed and unlisted companies**

Sales and total assets represent the original value in Saudi Riyal, ROA and ROS refer to EBITDA/Total assets and net income /Sales respectively, TANG1 and TANG2 are fixed assets / Total assets and fixed assets & inventory / Total assets respectively, FCF refers to the ratio of (operating cash flow- capital expenditure) to total assets, CR and QR refer to current ratio and Quick ratio respectively, UNIQ represents the ratio of marketing & selling expenses to sales, M/B is the market to book ratio, G. Sale and G. Assets refer to percentage change in total sales and percentage change in total assets over the period of study respectively, DIV is the ratio of dividend paid to annual income, RISK is the standard deviation of the first difference in annual earnings over mean earnings over the period of study, , Age is the number of years since the company was founded, GOV is the percentage of shares held by the government MIN, FAR, CEM and SER refer to manufacturing, farming, cement and service sectors dummy variables respectively.

	SIZE (Sales in m SAR[20])	SIZE (Assets in m SAR)	ROA	ROS	TANG 1	TANG 2	M/B	G. Sale	G. Assets	RISK	DIV	FCF	CR	QR	UNIQ	AGE	GOV	MIN	FAR	SER	CEM
Panel A: Listed companies																					
Mean	1,510.7	3,389.9	9.8%	26.5%	44.7%	53.6%	1.6	20.5%	8.9%	0.24	38.1%	4.8%	2	1.5	6%	20.4	9.8%	41.7%	15.0%	30%	13.3%
Median	185.2	739.5	8%	26%	48.6%	58.5%	1.3	4.6%	0.0%	0.11	28.8%	4%	1.4	1	3%	19	0				
Max	68,539.1	124,944.6	42%	111%	92.5%	92.8%	6.1	1165.3%	483.8%	12.98	340%	32%	13	13	57.5%	52	73%				
S. D	6,354.5	13,986.7	8.7%	29.9%	24.7%	25.2%	1.04	95.5%	39.3%	1.69	116.7%	10.1%	1.9	1.7	8.1%	10.5	18.4%				
Panel B: Unlisted companies																					
Mean	97.2	125.4	28.3%	26.9%	25%	43%	na	53.5%	11.6%	1.2	50.3%	6.5%	2.28	1.7	5.1%	14.2	na	29.5%	4.0%	66.5%	na
Median	28.8	28.2	23.6%	25%	17.7%	43.8%	na	1%	0%	0.23	0.0%	4.4%	1.4	1.05	0%	13	na				
Max	7,153.9	13,507.7	373.2%	124.6%	95%	99.4%	na	30785%	1754.5%	721.5	3393.6%	776.9%	52.5	40	116.7%	50	na				
S. D	305.6	668.4	23.4%	16%	23%	26.9%	na	929.2%	67.7%	31.12	190.1%	28.3	3.4	2.8	9.2%	7.4	na				

[20] £1 is approximately equal to about 6.5 SAR.

The means of the asset structure proxies of listed firms (i.e. the ratio of fixed assets & inventory and the ratio of net fixed assets both scaled by total assets) accounted for 53.6% and 44.7% of total assets respectively. These levels are higher than those observed in the unlisted firm sample, which are 43.1% and 25.1% of total assets respectively. Beside the fact that listed firms are larger than unlisted firms in term of assets, it is reflect the fact that the majority of companies in the unlisted sample operate in the service sector, which is characterized by less intensity of fixed assets. With regard to the free cash flow, liquidity, and uniqueness variables, the table illustrates that, on average, unlisted companies have slightly higher ratios than those listed companies, excluding the uniqueness ratio.

In terms of growth, the mean of the market to book ratio for listed firms is 1.6. This may reflect that the sharp increase in stock prices during the study period made the market value of equity higher than its book value. However, in terms of growth in sales and assets, the table demonstrates that unlisted firms are witnessing much higher growth than listed firms.

The table also shows that, on average, 38% of the earnings of listed firms are paid out as dividends, which is considered relatively high. This implies that listed firms are paying dividends for future external equity financing since equity is the main source of finance (figure 6.1). This is consistent with (La Porta, et al., 1999) argument that, in developing countries, firms pay dividends to build the reputation to market future stock issues. For unlisted companies, about 50% of the earnings are paid out as dividends. This implies that the shareholders of unlisted firms want to enjoy half of the company's earnings

and retained the other half for the future growth. The volatility in annual earnings as a measure of risk indicates that unlisted firms are more risky than those listed firms. Also, it can be seen from the table that listed firm are older than unlisted firms. Finally, it can be observed that firms operating in the service sector form the majority (66.5%) of unlisted sample, while the majority (41.7%) of listed firms are in manufacturing.

7.3.2 Data testing

It has pointed out in the previous chapter that box plot procedure based on 5 (inter-quartile range) is used to identify outliers in this dissertation due to the wide variation in the samples. Table 7.3 summarises the number of outliers identified for each variable and their percentage for the listed and unlisted samples.

Table 7.3: **Summary of outliers**

	Outliers			
Variables	**Listed**		**Unlisted**	
	No.	**(%)**	**No.**	**(%)**
STD	2	0.7	0	0.0
LTD	3	1.0	98	4.9
TD	0	0.0	0	0.0
SIZE (sales)	0	0.0	0	0.0
SIZE (assets)	0	0.0	0	0.0
ROA	0	0.0	102	5.1
ROS	2	0. 7	49	2.4
TANG1	0	0.0	0	0.0
TANG2	0	0.0	0	0.0
M/B	0	0.0		
G. Sales	13	4.3	62	3.1
G. Assets	13	4.3	43	2.1
RISK	32	10.7	114	5.7
DIV	1	0.3	38	1.9
FCF	0	0.0	16	0.8
CR	4	1.3	100	5.0
QR	11	3.7	82	4.1
UNIQ	1	0.3	9	0.4

After outlier observations were detected, the next step is cleaning the sample from outliers. There are several approaches to dealing with outliers. A simple method and the one used in this study is to winsorise the data by replacing the extreme observations with the nearest un-outlier neighbours.

Moreover, investigation of the present of the influential observations is also carried out in the present study using DFFITS process. As the table in the appendix 8 shows, numbers of influential observations (in both samples, less than 1% of the total observations) are identified in all models. Accordingly, influential observations are excluded from the models and reduced sample models are estimated. The unbalanced panel date fixed effect estimation technique results reveal that the effect of influential observation is marginal in unlisted sample and somewhat more important in listed sample. This most likely is due to sample size considerations.

In the listed sample, with 4 out of the 300 appear to be influential observations, the major changes are observed in total debt model. The insignificant positive relationship with size and uniqueness observed under unreduced regression turn into significant at 1% and 5% levels respectively while the insignificant negative relationship with liquidity and age turn into significant at 1% and 5% levels respectively. Apparently, these changes reflect the changes observed at disaggregate levels. In short-term debt model, with 5 observations appear to be influential observations, the insignificant negative relationships with size turns into positively significant at 5% level and the insignificant negative relationships with age turns into significant at 10% level. With only 2 observations seem to be influential observations, there

is no major change observed in long-term debt model except the increases in the significant level of the relationships with ROA and uniqueness proxies. Accordingly, these specifics relationships should be interpreted with caution in the analysis section. In unlisted sample, though 13, 17 and 13 out of 2015 are identified as influential observations in short-term, long-term and total debt respectively, the significant and the direction of the relationships of variables remain unchanged other than the positively significant at 1% relationship between tangibility and long-term debt decreased into 5% significance level. In light of these evidences, one would conclude that, the influence of the influential observations is minimal at least in unlisted sample.

7.3.3 Result analysis

Prior empirical studies have traditionally used different estimation methods based on the types of data to investigate the determinants of firm's capital structure. The most common methods are pooled, pure average cross-sectional, pure yearly cross-sectional and panel data analyses. Therefore, it is worth to investigate to what extent the obtained results are sensitive to the changes in the estimation methods. In their work, Bevan and Danbolt (2004) found significant differences in the results obtained by employing pooled OLS from those obtained by using panel analysis, in particular, fixed effects estimation. Accordingly, pooled, pure average cross-sectional, pure yearly cross-sectional and panel data analyses are curried out in this dissertation to provide a comprehensive analysis about the determinants of firm's capital structure of listed and unlisted Saudi companies. The STATA application version (9) was used here to run the regressions. Moreover, Harris and Raviv

(1991) emphasise that the interpretation of the results must consider the differences in measuring both debt ratios and the dependent variables of interest. Indeed, the results of the meta-analysis procedure (chapter three) show that the debt and the attributes measurements are sensitive cases in determining the observed relationship with leverage. Therefore, different debt elements and alternative proxies have been employed in this dissertation to draw a general conclusion about the real determinants of listed and unlisted Saudi companies' capital structure.

7.3.4 Pooled analysis

Using Tobit procedure, the debt ratios were censored at one, as there was several observations found above one. Table 7.4 presents the results for both listed and unlisted firms respectively. The table shows that all models report significant χ^2 indicating the rejection of the null hypothesis of joint insignificance of the coefficients at less than 1% level. In addition, adjusted R^2 is reported instead of the default output associated with TOBIT technique pseudo-R^2. According to STATA Corp, the pseudo-R^2 has no real meaning in terms of goodness-of-fit and, thus, it is better to calculate the R^2 between the predicted and observed values[21]. The calculated R^2 is similar to the one found in the OLS regression (www.stata.com/support/faqs/stat/pseudor2.html). Moreover, Graham et al. (1998) also report R^2 with TOBIT estimation. Nevertheless, the table shows that the adjusted R^2s' differ among all models in both samples. The Breusch-Pagan/Cook-Weisberg test and the variance

[21] To calculate the R^2 in Stata, the following commands were used after each regression: predict p, quietly correlate p dependent variable and then display r^2. Then, adjusted R^2 is calculated as follow = 1- ((1 - R^2)((N-1) / (N - K))) Pindyck and Rubinfeld (1998, p. 90)

inflation factor (VIF) are also reported and they will be discussed later in robustness check section.

7.3.4.1 Size

The proxy for size attribute is the natural log of assets. Table 7.4 shows that the regression coefficients of both samples for the effect of size on all debt ratios are systematically positive and statistically significant at the 1% level other than the relationship with short-term debt in listed sample. The results of the correlation with total debt reveals positive and significant at 1% with the highest magnitude observed among debt ratios in both samples. This finding is also consistent with the finding of previous empirical researchers using log of assets as proxy for size, which show that about 98% of the significant results are positively correlated with total debt. Moreover, these results appear to be driven by the results observed at disaggregate level. In listed sample, it seems that the obtained positively significant at 1% level relationship with long-term is the driving force since the relationship with short-term is insignificant. This implies that large firms rely more on long-term debt when they chose debt to finance their growth. In unlisted sample, on the other hand, the obtained positively significant at 1% level relationship with both short-term and long-term debt ratios appears to be responsible for the results with total debt. This in turn implies that small-unlisted firms face difficulties in accessing both short-term and long-term banks debt.

Table 7.4: **Pooled regression results of listed & unlisted sample based on Tobit estimation technique**

STD, LTD and TD refer to short-term, long-term, and total debt respectively. Size is the log of total assets. ROA refers to the return on assets. TANG1 is the ratio of fixed assets to total assets. FCF refers to the earnings before interest and tax plus depreciation less capital expenditure normalised by total assets. QR refers to the quick ratio. UNIQ is the ratio of selling & marketing expenses to total sales. M/B refers to the market to book ratio and G.ASSETS is the growth in assets for listed and unlisted companies. DIV refers to dividends paid divided by net income. LOGAGE is the log number of years since firm founded. RISK is the standard deviation of the first difference in annual earnings over mean of annual earnings. GOV is the percentage of shares held by the government. MINDUM, CEMEDUM, and FARMDUM refer to manufacturing, cement, and farming sectors dummy variables respectively. White's heteroskedastic-consistent covariance matrix estimation is used to adjust for heteroskedasticity. Probability of (Z) is in parentheses. Notes: *, **, and *** denote significant at the 10, 5, and 1% respectively (two tails).

	Exp. Sign	Listed (n = 300)				Unlisted (n = 2015)			
		STD	**LTD**	**TD**	**VIF**	**STD**	**LTD**	**TD**	**VIF**
LOGASSETS	+	0.016	0.033***	0.050***	1.82	0.059***	0.019***	0.092***	1.4
		(0.101)	(0.003)	(0.001)		(0.000)	(0.000)	(0.000)	
ROA	-	0.224***	-0.227***	0.003	1.77	-0.046**	-0.040***	-0.118***	1.4
		(0.000)	(0.000)	(0.966)		(0.037)	(0.000)	(0.000)	
TANG1	+/-	0.001	0.086***	0.086**	1.32	-0.115***	0.092***	0.035	1.3
		(0.936)	(0.000)	(0.011)		(0.000)	(0.000)	(0.110)	
FCF	-	-0.248***	-0.054	-0.339***	1.74	-0.124***	-0.011**	-0.144***	1.3
		(0.001)	(0.450)	(0.002)		(0.000)	(0.020)	(0.000)	
QR	-	-0.010**	-0.005	-0.016***	1.32	-0.032***	0.002*	-0.028***	1.2
		(0.020)	(0.122)	(0.004)		(0.000)	(0.052)	(0.000)	
UNIQ	-	-0.014	-0.027	-0.055	1.73	0.001	0.049***	0.078	1.2
		(0.801)	(0.661)	(0.531)		(0.982)	(0.005)	(0.158)	
M/B	Ins	-0.003	-0.006	-0.008	1.81				
		(0.402)	(0.157)	(0.192)					
G. ASSETS	Ins					-0.044***	-0.011***	-0.067***	1.1
						(0.001)	(0.004)	(0.000)	
DIV	-/+	-0.009	-0.024**	-0.034**	1.19	-0.002	-0.002	-0.005	1.1
		(0.173)	(0.016)	(0.012)		(0.609)	(0.237)	(0.223)	
LOGAGE	-/+	-0.048**	-0.026	-0.074**	1.32	0.081***	-0.020***	0.055***	1.1
		(0.033)	(0.228)	(0.020)		(0.000)	(0.000)	(0.004)	
RISK	-	-0.001	0.003	0.002	1.07	0.0001**	0.0001	0.0001*	1.0
		(0.757)	(0.280)	(0.649)		(0.039)	(0.571)	(0.084)	
GOV	+	-0.085***	-0.020	-0.103***	1.73				
		(0.000)	(0.445)	(0.004)					
MINDUM	+	0.040***	0.067***	0.109***	1.79	0.005	0.016***	0.019*	1.3
		(0.000)	(0.000)	(0.000)		(0.534)	(0.000)	(0.068)	
CEMEDUM	+	0.032**	0.044**	0.081***	2.35				
		(0.013)	(0.037)	(0.002)					
FARMDUM	-	-0.008	-0.016	-0.023	1.94	-0.028	-0.001	-0.052**	1.1
		(0.432)	(0.263)	(0.230)		(0.220)	(0.908)	(0.040)	
INTERCEPT		-0.030	-0.222**	-0.249*		-0.309***	-0.114***	-0.511***	
		(0.745)	(0.025)	(0.075)		(0.000)	(0.000)	(0.000)	
Wald χ^2 -test		117.14***	96.84***	153.06***		625.30***	377.39***	803.43***	
Adjusted R^2		0.2589	0.2395	0.3094		0.1878	0.2565	0.2330	
Breusch - Pagan /Cook-Weisberg Hetero test		87.04***	82.45***	54.16***		257.81***	751.55***	237.28***	

Moreover, the table shows that short-term debt has higher magnitude than long-term debt while these magnitudes are opposite in listed sample. This may suggest that while large listed firms rely more on long-term debt, large unlisted firms rely more on short-term debt than on long-term debt.

Accordingly, one is unable to reject the hypothesis that size has a positive influence on debt ratios in both samples other than the relationship with short-term debt in listed sample where it is found insignificant.

6.4.2.2 Profitability

The return on assets (ROA) is used as the proxy for profitability. The results for listed sample reveal insignificant positive relationship between profitability and total debt. The strong positive and negative association with short-term and long-term debt ratios most likely drives this result. Accordingly, the observed negative relationship with long-term debt is consistent with pecking order hypothesis. On the other hand, the positive relationship with short-term debt is consistent with trade-off theory that suggests a positive relationship between debt and profitability due to tax considerations. However, it has been pointed out earlier that Saudi companies pay small level of tax (Zakat), which makes the tax advantage of debt for firms negligible. Nevertheless, this positive relationship may suggest that profitable firms resort to short-term debt to finance their current assets.

On the other hand, the results of unlisted sample show that profitability has systematically significant (1%) negative influence on all debt ratios other than short-term debt where the significant level is 5%. This is interpreted as

meaning that a firm with higher profitability has lower debt ratios. These results, thus, lend strong support to the pecking order hypothesis.

Moreover, the meta-analysis conducted in chapter three reveals that 100% and 98.32% of the significant results finds a negative relationship between ROA and total and long-term debt ratios respectively. Therefore, the negative results observed in long-term in listed sample and all debt elements in unlisted sample are consistent with the prediction and with previous studies' findings using ROA as proxy for profitability.

In sum, one is unable to reject hypotheses that profitability is negatively correlated with debt levels other than total and short-term debt ratios in listed sample, which are found insignificant with the first and positive with the second.

7.3.4.2 Tangibility

The ratio of fixed assets to total assets is used as proxy for tangibility. In listed sample, the relationship between tangibility and total debt is positive and significant at 5% level. At the disaggregate level, however, the strong positive relationship observed with long-term debt is the key element of the observed result in total debt since the relationship with short-term debt seems to be insignificant. In unlisted sample, on the other hand, the relationship between tangibility and total debt is insignificant. The strong negative and positive association with short-term and long-term debt ratios most likely drives this result.

In general, the positive relationship with long-term debt found in both samples implies that firms with sufficient collateral asset have easier access to long-term bank loans. Recall that one of the requirements of Saudi banks to lend long-term debt is a sufficient collateral asset at least to cover 100% of the value of the loan. Moreover, it is consistent with meta-analysis finding that 97.52% of significant results find positive relationship between tangibility and book based long-term debt. The insignificant result observed with total debt in unlisted sample appears to be common since only about 65% of total sample in meta-analysis find significant results of which 90.21% finds positive direction. This indicates that the significant results most likely to be positive which also provide support to the relationship with total debt observed in listed sample. The insignificant relationship with short-term debt is also not surprising since comparing the significant results observed with total debt (65%) with those with long-term debt (76%) may suggest that the insignificant of the correlation with short-term debt is the key element of the observed differences. Moreover, the higher positive significant results observed with long-term debt (98%) compared to (90%) in total debt may suggest that the negative correlation between short-term and tangibility reduce the strength of the overall positive relationship with total debt.

With exception of the insignificant positive relationship observed with short-term debt in listed, the results are generally consistent with prediction and assumption that the length of loan is likely to be matched to the life of assets used as collateral. Accordingly, one fails to reject the hypotheses that tangibility is positively correlated with total and long-term debt ratio other

than the relationship with total debt in unlisted sample where it is found insignificant. One also is unable to reject the negative relationship between tangibility and short-term debt in unlisted sample but not for short-term debt in listed sample.

7.3.4.3 Free cash flow

The ratio of the earnings before interest and tax plus depreciation less capital expenditure to total assets is used to capture the influence of free cash flow on debt levels. The table shows that free cash flow variable in both samples is negatively correlated with total debt at 1% level of significant. At disaggregate level, however, a difference is observed between the two samples. In listed sample, the observed result in total debt seems to be driven by the strong significant (1%) negative association with short-term debt as the relationship with long-term debt is insignificant. On the other hand, the strong and moderate negative relationship observed with short-term and long-term debt ratios respectively seems to be both the driving forces of the total debt result.

The results in both samples, however, most likely reflect the fact that the conflicts between managers and shareholders suggested by the free cash flow theory of Jensen (1986) are not an issue among Saudi companies. Indeed, the high concentrated ownership in the case of listed companies and the family ownership in the case of unlisted companies reduce such conflicts. Alternatively, if the free cash flow can be seen as the capacity of the firm's internal generated resources, then the observed negative relationship provide strong support to the pecking order hypothesis. Moreover, the observed

significant negative relationship is consistent with the overall finding of previous empirical researchers, which shows that 78.52% of the significant results are negative. This in turn implies that the pecking order prediction outweigh the prediction of the free cash flow agency theory.

In sum, one is unable to reject hypotheses that free cash flow is negatively correlated debt elements other than the relationship with long-term debt in listed sample, which is found insignificant.

7.3.4.4 Liquidity

The quick ratio, which is current assets less inventory to current liabilities, is used as a proxy for liquidity. At aggregate level, the relationship between liquidity and total debt in both samples appear to be negative and significant at 1% level. This is consistent with the finding of previous empirical researchers, which shows that 100% of the significant results reveal negative correlation between liquidity and total debt defined by book value. However, this result appears to be driven by the strong significant (1%) negative association with short-term debt. The result indicates that firms with insufficient liquidity use more short-term debt. This in turn lends support to the hypothesised negative relationship between liquidity and short-term debt and to Bevan and Danbolt's (2004) argument that liquidity is an important determinant of short-term bank borrowing.

On the other hand, the relationship with long-term debt is mixed. In listed sample, it is found that liquidity negatively but insignificantly correlated with long-term debt. Antoniuo et al. (2002) explain the low level of significance by

the fact that firms' close relationship with banks mitigates asymmetric information problems, which in turn reduces the need for internal liquidity. The fact that Saudi listed firms have strong relationship with banks gives more credibility to this explanation. Moreover, the insignificant correlation with long-term debt is not surprising since about 30% of total sample in meta-analysis find insignificant results. In unlisted sample, on the other hand, it is found that liquidity is positively correlated with long-term debt at 10% level of significance. This indicates that unlisted firms with sufficient liquidity have easier access to long-term bank loans. This result, however, are inconsistent with the finding of previous empirical researchers, which shows that 96.5% of the significant results reveal negative correlation between liquidity and long-term debt defined by book value. It is also contradict the pecking order hypothesis, which suggests negative relationship. In summary, in both samples, while one is unable to reject the hypotheses that liquidity is negatively correlated with both total and short-term debt ratios, one is able to reject the hypothesised negative association with long-term debt. This in turn lends partial support to pecking order hypothesis.

7.3.4.5 Uniqueness

The proxy used to measure the impact of uniqueness is marketing and selling expenses. The results also reveal conflicting evidences. In listed sample, insignificant negative associations are observed between uniqueness and all debt elements. In unlisted sample, however, while a strong significant (1%) positive relationship with long-term, insignificant positive relationship with total debt and short-term debt ratios are obtained. Nevertheless, both results

are inconsistent with the prediction and with the Titman's (1984) arguments that firms characterized by unique products should be financed with relatively less debt. The results also contradict the overall finding of previous empirical researchers, which shows that 99.15% of the significant results are negative. However, it is important to note that the significant positive relationship between book-based long-term debt and uniqueness as measured by marketing and selling expenses observed in unlisted sample is not surprising since 42.43% of the previous empirical researchers' findings show a significant positive relationship. This in turn raises the doubt about this proxy in capturing the suggested negative effect of uniqueness on leverage.

In sum, one fails to accept the hypotheses that uniqueness as measured by marketing and selling expenses is negatively correlated with debt ratios at least in this study.

7.3.4.6 Growth

Due to the availability of data, two proxies for growth are employed to capture the impact on leverage. The market-to-book ratio and the growth in assets are used here to measure the growth variable for listed and unlisted firms respectively. The results show that insignificant negative relationship between market to book ratio and all debt levels is obtained in listed sample. These results in particular the relationship with long-term debt are not surprising since meta-analysis finding shows insignificant negative relationship exists between market to book ratio and long-term debt defined by book value. However, the relatively high significant correlation (0.46) observed in the correlation matrix in the appendix 7 between market-to-book

ratio and profitability as measured by ROA raises the concern about this result. Such high correlation might be responsible for observing insignificant result. Therefore, the result of this relationship should be interpreted with some caution.

In unlisted sample, on the other hand, the strong significant (1%) negative association between growth in assets and total debt indicates the presence of the agency conflict between shareholders and lenders. it is consistent with the result obtained by meta-analysis that found 70.60% of the significant results of growth in assets are negatively correlated with total debt defined by book value. However, this result seems to be driven by the strong significant negative association observed with both short-term long-term debt ratios. Though the strong negative relationship with long-term lend support to the agency costs theory, it contradicts the meta-analysis finding where about 92% of the significant results find positive relationship between growth as measured by growth in assets and book based long-term debt. Moreover, the strong negative relationship with short-term debt contradicts the argument that the agency problem may be mitigated if the firm issue more short-term-debt. However, Bevan and Danbolt (2004) argue that banks are unwilling to provide short-term debt to growing firms before proven assets in place. This explanation, thus, is hold here due to the fact that Saudi banks adopt conservative lending policy.

Accordingly, one is able to reject the hypothesised positive (negative) relationships between growth and short-term and (long-term and total) debt ratios in listed sample. In unlisted sample, on the other hand, while one is

unable to reject the negative relationships with long-term and total debt ratios, one is able to reject the positive relationship with short-term debt.

7.3.4.7 Dividends

The ratio of dividends paid to net income is used as a proxy for dividends payout. The results reveal that dividend coefficients are significantly negatively correlated with all the debt ratios other than short-term debt in listed sample but insignificantly correlated with all the debt ratios in the unlisted sample. However, the significant negative relationship provides support to La Porta et al.'s (1999) argument that paying dividends in the developing countries is a sign of commitment to build the reputation for future stock issues. Therefore, this argument can explain the significant negative relation observed in listed companies since the equity is the main source of funds among listed companies. These results are also consistent with meta-analysis finding that 88% and 97% of the significant results finds negative relationship between dividends payout ratio and total and long-term debt ratios based on book value. On the other hand, the small magnitudes combined with the insignificant levels of the results observed in unlisted sample indicate that dividends are not determinant of the firm's capital structure in unlisted sample.

In sum, while one is unable to reject the hypothesised negative association between dividends and debt ratios other than association with short-term debt where it is found insignificant in listed sample, one reject the hypothesised positive association between dividends and debt ratios in unlisted sample.

7.3.4.8 Age

The natural log of the number of years since company's establishment is used as proxy for age. The analysis provides mixed results for the relation between age and debt ratios. In listed sample, a significant negative relationship observed between age and total debt ratio. This implies that new firms use more debt than older ones. At disaggregate level, however, the results reveal that the negative association observed with short-term debt mainly drives this result since insignificant results observed with long-term debt. These results in turn indicate that new listed firms rely more on short-term debt, as they are constrained from long-term debt. Accordingly, these results contradict the meta-analysis finding where about 80% (97%) of the significant results find positive (negative) relationship between age and total and (long-term) debt ratios.

On the other hand, a significantly positive relationship between age and total debt ratios is observed in unlisted sample. This result most likely reflects the significant positive relationship observed between age and short-term debt ratio. This implies that these firms have a good reputation of credit and build a good relation with banks; thus, they have better conditions to obtain short-term debt than younger firms. The negative association observed with long-term debt ratio indicates that these firms are young and do not have sufficient internally funds to finance new investment. However, knowing the bank's conservative long-tem lending policy suggests that the reputation and the strong relation with banks are the key issues. This result most likely suggests that the owners of these new firms are belonging to rich families who usually

occupy the board directors of the banks and, thus they have easy access to long-term debt. Moreover, these results are also consistent with the meta-analysis findings mentioned above where age is found positively and negatively correlated with book based total and long-term debt ratios respectively.

Accordingly, while one is able to reject the hypothesis that age positively correlated with total and short-term debt ratios and negative correlated with long-term debt ratio in listed sample, one is unable to reject in unlisted sample.

7.3.4.9 Risk

The standard deviation of the first difference in annual earnings over mean of the earning is applied as a proxy for risk. The table shows that the risk coefficients are insignificantly correlated with all debt ratios in the listed sample. In unlisted sample, however, a weak significant positive relationship observed between risk and total debt ratio, which is mainly driven by the moderate significant positive correlation observed with short-term debt. The results are inconsistent with the hypothesis that firms with high variability in earnings have a greater risk not to meet their debt obligations and, thus, they should have lower debt ratio. However, the small sizes of the coefficients observed in both samples raise the concerns about the risk measure since the length of the period employed in this study (i.e. five years). Such period may be too short to capture the effect of risk measure on debt ratios adequately. Accordingly, it is hard to draw a conclusion regarding this attribute.

7.3.4.10 Government

The percentage of equity owned by the government is used as a proxy to measure the impact of government ownership on the capital structure of listed firms. The reported results show that the estimated coefficients of government with debt ratios are significantly negatively correlated with short-term and total debt, but statistically insignificantly correlated with long-term debt. This implies that companies with government ownership are using less debt. This is consistent with the argument that government chose to privatise some of its companies due to government budgetary deficits. This means that state companies will use more equity and less debt to finance their growth. Moreover, if La Porta et al.'s (1999) argument that firms in developing countries pay dividends to build the reputation to market future stock issues holds, then the significant positive correlation between government ownership and dividends observed in the correlation matrix in the appendix 7 supports the above argument. Furthermore, the observed significant negative relationship between government ownership and total debt is consistent with the finding of the previous studies that found 86.81% of the significant results are negatively correlated with total debt.

However, though the observed results lend some support to the hypothesises, the relatively high correlation (0.57) between government and log assets as measure of size observed in the correlation matrix in the appendix 7 raise the concerns about this relationship. This high correlation may have some impact on the insignificant negative relationship observed with long-term debt since

size is found positively correlated with long-term debt. Accordingly, the previous interpretation of this relationship should be taken with caution.

In short, one unable to reject hypothesises that government ownership is negatively associated with debt elements but not for the relationship with long-term debt where it is found insignificant.

7.3.4.11 Industry

Dummy variables are used to investigate if capital structure varies among industry sectors. MINDUM, CEMEDUM, and FARMDUM refer to manufacturing, cement, and farming sectors dummy variables respectively (with the service sector used as the base in both samples). The results show that companies in the manufacturing sector have a statistically positive correlation with all debt ratios in listed and with long-term and total debt ratios in unlisted sample. The results also show that cement sector has a significant positive relationship with all debt ratios in listed sample. These results, therefore, indicate that firms in these two sectors, in general, have higher debt level than those of firms in the service sector, which is the base sector in the analysis. For the farming sector, while an insignificant association with all debt ratios is observed in listed sample, only moderate significant (5%) negative relationship is obtained with total debt ratio in unlisted sample. Accordingly, the hypothesis that firms operate in manufacturing and cement industries will show higher debt levels than those operate in farming and service industries is unable to be rejected.

7.3.5 Average cross-sectional analysis based on 2004 debt ratios

In pure average cross-sectional estimation, the results may be more robust since lagging the explanatory variables will reduce the potential reverse causality between dependent and explanatory variables and averaging will reduce the effect of fluctuation in the explanatory variables. However, sample size is considerably reduced with only one observation per company rather than five. For the average-based analysis, the two equations of the listed and the unlisted sample are also estimated for the three debt elements. The regression includes the 2004 leverage level as dependent variable and the explanatory variables are four year average (2000-2003).

Table 7.5 presents the results for both listed and unlisted firms respectively. This shows that the explanatory power of the averaging regressions is generally slightly lower than the pooled regressions, as indicated by the lower adjusted R^2s. However, the models report significant χ^2 indicating the rejection of the null hypothesis of joint insignificance of the coefficients, at the 1% level in all models except short-term debt for listed companies (5% level).

In the short-term debt models for listed companies, profitability, free cash flow, liquidity, manufacturing and cement dummies show results consistent with the pooled analysis, but with lower significance levels. However, the positive association with size now becomes significant (5% level) while the negative impact of age becomes insignificant. By contrast, for unlisted companies the results are consistently significant for size, tangibility, free

cash flow, liquidity and risk but the negative relationships with profitability and growth in assets become insignificant.

For long-term debt in listed companies, size and the manufacturing dummy are the only variables that remain significant albeit at lower significance levels. In unlisted companies, the results are consistently significant for size, tangibility, free cash flow and uniqueness but the latter at a lower (10%) significance level. For *total* debt in listed companies, size and the manufacturing dummy continue to be highly significant; free cash flow, government and the cement dummy remain significant but at lower levels of significance than in the pooled regressions. For *total* debt in unlisted companies, the results for size, free cash flow, liquidity and risk variables are broadly consistent with the pooled regressions but profitability, growth in assets, age and the two industry dummies cease to be significant.

Overall, it would appear that the broad thrust of the results remains unchanged in the average cross-sectional regressions. However, the results are less significant, probably partly as a result of the much-reduced sample size and partly because the pooled regression may overstate significance.

Table 7.5: **Average cross-sectional analysis results of listed & unlisted sample based on Tobit technique**

STD, LTD and TD refer to short-term, long-term, and total debt respectively. Size is the log of total assets. ROA refers to the return on assets. TANG1 is the ratio of fixed assets to total assets. FCF refers to the earnings before interest and tax plus depreciation less capital expenditure normalised by total assets. QR refers to the quick ratio. UNIQ is the ratio of selling & marketing expenses to total sales. M/B refers to the market to book ratio and G.ASSETS is the growth in assets for listed and unlisted companies. DIV refers to dividends paid divided by net income. LOGAGE is the log number of years since firm founded. RISK is the standard deviation of the first difference in annual earnings over mean of annual earnings. GOV is the percentage of shares held by the government. MINDUM, CEMEDUM, and FARMDUM refer to manufacturing, cement, and farming sectors dummy variables respectively. White's heteroskedastic-consistent covariance matrix estimation is used to adjust for heteroskedasticity. Probability of (Z) is in parentheses.
Notes: *, **, and *** denote significant at the 10, 5, and 1% respectively (two tails).

	Exp. Sign	Listed (n = 60)				Unlisted (n = 403)			
		STD	**LTD**	**TD**	**VIF**	**STD**	**LTD**	**TD**	**VIF**
LOGASSETS	+	0.035** (0.033)	0.051** (0.016)	0.087*** (0.002)	1.94	0.062*** (0.000)	0.016*** (0.009)	0.090*** (0.000)	1.48
ROA	-	0.314* (0.067)	-0.086 (0.408)	0.228 (0.227)	2.23	-0.032 (0.605)	-0.030 (0.132)	-0.068 (0.340)	1.68
TANG1	+/-	-0.036 (0.302)	0.026 (0.548)	-0.010 (0.872)	1.45	-0.136*** (0.000)	0.078*** (0.000)	-0.009 (0.870)	1.29
FCF	-	-0.512* (0.058)	-0.145 (0.529)	-0.657** (0.049)	3.73	-0.274*** (0.003)	-0.064*** (0.004)	-0.366*** (0.000)	1.64
QR	-	-0.018* (0.086)	-0.009 (0.505)	-0.027 (0.134)	1.92	-0.031*** (0.000)	0.003 (0.153)	-0.023** (0.011)	1.24
UNIQ	-	-0.005 (0.974)	-0.197 (0.152)	-0.202 (0.367)	2.60	0.058 (0.649)	0.079* (0.090)	0.140 (0.363)	1.33
M/B	Ins	0.008 (0.595)	-0.011 (0.494)	-0.003 (0.903)	3.76				
G. ASSETS	Ins					-0.004 (0.954)	-0.002 (0.925)	-0.043 (0.571)	1.19
DIV	-/+	-0.014 (0.432)	-0.031 (0.266)	-0.045 (0.237)	1.75	0.003 (0.846)	-0.001 (0.887)	-0.003 (0.878)	1.27
LOGAGE	-/+	-0.012 (0.705)	0.016 (0.700)	0.004 (0.950)	1.45	0.071 (0.116)	-0.011 (0.327)	0.068 (0.159)	1.17
RISK	-	-0.003 (0.479)	0.006 (0.156)	0.003 (0.540)	1.56	0.0001** (0.030)	0.0001 (0.329)	0.0001* (0.060)	1.02
GOV	+	-0.087** (0.020)	-0.034 (0.474)	-0.121* (0.054)	1.80				
MINDUM	+	0.031* (0.054)	0.053** (0.044)	0.084*** (0.009)	2.05	-0.001 (0.941)	0.009 (0.188)	0.001 (0.975)	1.31
CEMEDUM	+	0.053* (0.058)	0.034 (0.413)	0.087* (0.070)	4.07				
FARMDUM	-	0.017 (0.531)	0.011 (0.689)	0.028 (0.520)	2.39	-0.023 (0.732)	0.007 (0.670)	-0.031 (0.663)	1.11
INTERCEPT		-0.241 (0.128)	-0.401** (0.037)	-0.643** (0.014)		-0.304*** (0.006)	-0.101** (0.039)	-0.506*** (0.002)	
Wald χ^2 -test		26.87**	29.42***	36.42***		145.58***	61.07***	156.67***	
Adjusted R^2		0.2528	0.1178	0.2642		0.1623	0.2073	0.1902	
		25.59***	19.93***	6.70***		32.89***	224.50***	42.78***	

7.3.6 Yearly cross-sectional analysis

To illustrate the disadvantages of pooled and average cross-sectional analysis, the two equations of the listed and the unlisted sample are estimated for the three debt elements (i.e. short-term, long-term, and total debts) for every year covered in this study (2000 through 2004). This process results in estimating a total of 30 models of which 10 models are estimated for each debit ratio. Tables in appendix 4 present the results of these models. As it can be seen, all models report significant χ^2 indicating the rejection of the null hypothesis of joint insignificance of the coefficients but vary in the significance level.

In short-term models, the results for listed companies show considerable variation in size and significance over the period. By contrast, the results for unlisted companies show consistent significant results for size, tangibility and liquidity; free cash flow and age are also consistent across 4 of the 5 years. In the long-term models, all the explanatory variables in listed sample have shown changes either in the significant levels or in the direction. In unlisted, size, profitability, and tangibility are the only variables that remains systematically significant but with variation in the significant level over the study period. In total debt models, as seen in short-term and long-term regressions, all the explanatory variables in listed sample have shown changes either in the significant levels or in the direction. In unlisted sample, on the other hand, size, free cash flow, liquidity and growth in assets remain systematically significant but with variation in the significant level over the study period.

As apparent in this illustration, the results interpretations and conclusions of pure cross-sectional analysis are dependent on the timing of the observation. Bevan and Danbolt (2004) conclude that failure to control for time effects may incur a serious bias into the analysis of corporate capital structure and raise question about some of the conclusions obtained under more traditional analyses. Indeed, comparing the results of pure cross-sectional regressions, average cross-sectional regressions and those of pooled regressions illustrate that the obtained results by pooled regression have the highest level of significance. The significance of estimated coefficients under pooled regression may be over estimated, as firms in the sample are included more than once over study period (Barclay et al., 1995 and Bevan and Danbolt, 2004). Moreover, though it reduces the effects of the fluctuation in the explanatory variables, averaging the sample over the period of study ignores the time effects that should be considered in the analysis. This in turn may lead to under estimation bias. Accordingly, it is important to investigate the association between debt elements and company characteristics using estimation technique that overcome the disadvantages of pooled and average estimation techniques. One appropriate technique that incorporates both time-series and cross-sectional effects and controls also for time-invariant firm-specific factors is fixed effects panel data analysis.

7.3.7 Fixed effects panel analysis

Given the potential importance for time-invariant firm-specific heterogeneity, fixed effects approach is used in the analysis. Moreover, as pointed out earlier in methods chapter, industries dummies, government ownership, and Risk are

excluded from the estimated models due to either time-invariant or measurement issues associated with these variables. Table 7.6 presents the results of the panel data estimations. Over all, the fixed effects models are all report significant F-test indicating the rejection of the null hypothesis of joint insignificance of the coefficients at less than 1% level.

7.3.7.1 Size

It seems the impact of controlling for time-invariant heterogeneity on the relationship between size and debt elements is considerable in listed sample while it is trivial in unlisted sample. In listed sample, the strong significant (1%) positive relationship with total debt observed in pooled and average estimation techniques becomes positively insignificant. However, it has been seen earlier in testing data section that this result turns into a significant level (1%) under the reduced sample. At long-term debt level, the strong (moderate) significant positive relationship observed in pooled and (average) estimation techniques respectively becomes positively significant at 10% level.

On the other hand, at the short-term debt level, the insignificant positive observed under pooled estimation technique and the significant at 5% positive relationship observed under average estimation technique respectively becomes negatively insignificant. However, this result seems to be driven by the some influential observations because turns into negative and significant 5% level under the reduced sample. This in turns implies that large listed firms use more long-term debt and less short-term debt.

Table 7.6**: fixed effects Panel data results**

STD, LTD and TD refer to short-term, long-term, and total debt respectively. Size is the log of total assets. ROA refers to the return on assets. TANG is the ratio of fixed assets to total assets. FCF refers to the earnings before interest and tax plus depreciation less capital expenditure normalised by total assets. QR refers to the quick ratio. UNIQ is the ratio of selling & marketing expenses to total sales. M/B refers to the market to book ratio and G.ASSETS is the growth in assets for listed and unlisted companies. DIV refers to dividends paid divided by net income. LOGAGE is the log number of years since firm founded.

Note: White's heteroskedastic-consistent covariance matrix estimation is used to adjust for heteroskedasticity. Probability of (t) is in parentheses for. *, ** and *** denote significant at the 10, 5, and 1% respectively (two tails).

Panel	**Listed**			**Unlisted**		
	STD	**LTD**	**TD**	**STD**	**LTD**	**TD**
SIZE	-0.047	0.050*	0.004	0.066***	0.024***	0.097***
	(0.469)	(0.058)	(0.964)	(0.003)	(0.000)	(0.000)
ROA	-0.006	-0.189**	-0.183	-0.082***	-0.014*	-0.119***
	(0.939)	(0.013)	(0.102)	(0.003)	(0.072)	(0.000)
TANG	0.004	0.104**	0.092	-0.030	0.048***	0.051
	(0.935)	(0.018)	(0.234)	(0.426)	(0.007)	(0.212)
FCF	-0.130***	-0.011	-0.183**	-0.110***	-0.002	-0.119***
	(0.003)	(0.776)	(0.010)	(0.000)	(0.415)	(0.000)
QR	-0.007*	-0.001	-0.008	-0.020***	0.001	-0.019***
	(0.079)	(0.820)	(0.149)	(0.000)	(0.292)	(0.000)
UNIQ	-0.016	0.213*	0.187	-0.053	0.007	0.103
	(0.844)	(0.052)	(0.267)	(0.572)	(0.830)	(0.239)
M/B	0.003	-0.007	-0.005			
	(0.449)	(0.126)	(0.431)			
G. Assets				-0.025**	-0.005**	-0.034***
				(0.023)	(0.034)	(0.004)
DIV	-0.001	-0.003	-0.003	0.003	0.001	0.005**
	(0.818)	(0.448)	(0.603)	(0.125)	(0.270)	(0.031)
LOGAGE	-0.126	0.032	-0.087	0.095***	-0.044***	0.006
	(0.185)	(0.626)	(0.455)	(0.006)	(0.000)	(0.865)
INTERCEPT	0.636	-0.456*	0.183	-0.401**	-0.118***	-0.519***
	(0.216)	(0.064)	(0.776)	(0.013)	(0.005)	(0.002)
F -test	3.98***	4.04***	5.15***	*13.87***	*3.33***	14.70***
R^2 within	0.1448	0.2023	0.2216	0.1218	0.0278	0.1311
R^2 between	0.0313	0.0729	0.0473	0.1838	0.2315	0.2448
R^2 overall	0.0389	0.0852	0.0680	0.1722	0.1949	0.2267
Corr (ui, x)	-0.4221	-0.2442	-0.1376	-0.0104	0.1217	0.0331
N	300	300	300	2015	2015	2015

Accordingly, under fixed effects regression and under the full sample at least, the hypothesised positive relationship between size and debt elements is rejected but not for the correlation with long-term debt where it is found positively significant.

In unlisted sample, on the other hand, the relationship with all debt elements remains positively significant at 1% level with increases in coefficients' magnitude. Accordingly, once is controlled for time-invariant heterogeneity, one remains to be unable to reject the hypothesised positive relationship between firm's size and debt elements in unlisted sample.

7.3.7.2 Profitability

In listed sample, though the relationship with total debt continues to be insignificant as observed in previous estimation techniques, it becomes negative under fixed effect estimation. Moreover, The positively significant at 1% and 10% levels relationship with short-term debt observed under pooled and average regressions respectively turns into insignificantly negative relationship. On the other hand, the significant at 1% and insignificant negative relationship observed under pooled and under average estimation techniques respectively becomes negatively significant at 5% level. Accordingly, while one is unable to reject the negative relationship between profitability and long-term debt, one is able to reject the negative relationship with both short-term and total debt in listed sample, once firm effects are controlled for. This in turn provides supports to the pecking order hypothesis only at the level of long-term debt.

In unlisted sample, however, the influence of profitability on all debt elements remains significantly negative. These results relatively are consistent with the results obtained under pooled with slight changes in the significant levels in particular at short-term and long-term debt ratios. On the other hand, the results contradict the insignificant results observed under average estimation techniques.

In short, under fixed effects regression, one fails to reject the hypothesised negative relationship between profitability and debt elements in unlisted sample. This in turn provides strong support to the pecking order hypothesis.

7.3.7.3 Tangibility

In listed sample, the result of the relationship between tangibility and total debt reveals insignificant positive relationship, which is consistent with the result observed under average regression but with reverse sign. Both results, however, contradict the strong significant relationship observed under pooled regression. At disaggregate level, the relationship with short-term debt continues to be insignificant positive relationship which is consistent with the insignificant positive relationship observed under pooled regression and with the insignificant level but with reverse sign observed under average regression. Moreover, the strong significant (insignificant) positive relationship with long-term debt observed under pooled (average) regressions becomes positively significant at 5%, once one control for time-invariant heterogeneity.

In unlisted sample, under fixed effects technique, the relationship between tangibility and total debt continues to be insignificant as observed in other two previous estimation techniques. Moreover, while the positively significant at 1% level observed under pooled and average techniques is also obtained once firm effects are controlled for, the strong significant negative relationship observed with short-term debt observed under pooled and average regressions turns into insignificant level.

In brief, the results support the collateral explanation at long-term models in both samples but contradict the matching principle at short-term models. Accordingly, one is unable to reject the hypothesis that tangibility is positively correlated with long-term debt but is able to rejects the hypothesised positive (negative) association with total (short-term) debt in both samples once is controlled for time-invariant heterogeneity.

7.3.7.4 Free cash flow

It appears that the estimation technique has marginal impact concerning the relationship between free cash flow and debt elements at least in listed sample. Indeed, the significant negative relationship with short-term and total debt and insignificant negative results with long-term debt observed in other estimation techniques continues to be observed under fixed effects estimation technique. In unlisted sample, however, while the significant negative relationship with short-term and total debt continues to be obtained, the association with long-term debt turns into insignificant level once controlled for time-invariant heterogeneity.

In short, under fixed effects analysis, the results lend support to pecking order hypothesis at short-term and total debt models in both samples but are undetermined at long-term models as insignificant relationships are observed in both samples. Nevertheless, the results contradict agency theory, which in turn imply that the free cash flow problem is not an issue among Saudi companies.

Accordingly, one is unable to reject the hypothesised negative relationship between free cash flow and debt elements other than the relationship with long-term debt where it is found insignificant in both samples.

7.3.7.5 Liquidity

In listed, as seen in average regressions, the strong significant (1%) negative relationship between liquidity and total debt obtained in pooled regression turns into insignificant level under fixed effects technique. As observed with size, this result seems to be driven by the some influential observations because it turns into significant at 1% level under the reduced sample. The relationship with long-term debt remains insignificant while the relationship with short-term debt remains negative but with decrease in the significant level from 5% under pooled to 10 % as under average model. In unlisted sample, the significant negative relationships with short-term and total debt ratios found in pooled and average regressions are also found to be negative and significant at 1% level once controlled for time-invariant heterogeneity. On the other hand, as seen in average regression, the weak significant positive relationship observed under pooled regression turns into insignificant level. In general, these results provide strong evidence to Bevan and Danbolt's (2004)

suggestion that liquidity is an important of short-term bank borrowing since the negative relationship with total debt is mainly driven by the negative relationship with short-term debt in both sample and regardless to estimation techniques.

Accordingly, one rejects the hypothesised negative relationship between liquidity and debt elements other than the relationship with short-term debt where it is found significant at 10% level in listed sample at least under the full sample. In unlisted sample, on the other hand, one failed to reject the hypothesised negative association with debt elements other than the relationship with long-term debt where it is found insignificant.

7.3.7.6 Uniqueness

In listed sample, the insignificant negative association with total debt observed in prior estimation techniques continues to be insignificant but with reverse sign (positive). However, this result seems also to be driven by the some influential observations because the insignificant positive relationship turns into significant at 5% level under the reduced sample.

The relationship with long-term debt where the insignificant negative relationship observed in prior estimation techniques turns into positive and significant at 10% level. This result and the result observed with total debt under reduce sample, thus, contradict Titman's (1984) argument that suggest negative association between uniquness and leverage. Also, if the selling expense used to capture the effects of uniqueness on leverage represent the capacity of pre-existing non-debt tax shields firms have, then these results

contradict tax theory, in particular, DeAngelo and Masulis (1980) argument that suggest negative relationship. Barakat and Rao (2004) also found that non-debt tax shields significantly positively correlated with leverage in non-tax arab countries while significantly negatively correlated in tax-Arab countries. Nevertheless, the correlation with short-term debt, however, continues to be insignificant and negative as seen in prior estimation techniques.

In the unlisted sample, the association with total debt continues to be positively insignificant as observed in prior estimation techniques. At disaggregate level, the insignificant negative correlation with short-term debt observed in prior estimation techniques continue to be insignificant but with reverse in sign. However, the strong (weak) significant positive relationship with long-term debt found in pooled and average regressions respectively turns into insignificant once is controlled for time-invariant heterogeneity.

In summary, the obtained results continue to contradict Titman's (1984) arguments that suggest that uniqueness has negative influence on debt level. Accordingly, one continues to reject the hypothesised negative relationship between debt and uniqueness.

7.3.7.7 Growth

As observed in average regression, the analysis show that the insignificant negative relationship between market-to-book ratio and all debt levels observed in pooled regression remains insignificant with reverse sign in short-term debt in listed sample. These results in turns contradict the hypothesised

positive (negative) relationships between growth and short-term and (long-term and total) debt ratios. In unlisted sample, the negatively significant at 1% level relationship between growth in assets and all debt ratios observed under pooled regression continues to be negatively significant at 1% level with total debt but with 5% level with both short-term and long-term debt. This in turns contradicts the insignificant results obtain under average regression. Nevertheless, the results indicate that growing unlisted firms face difficulties accessing to both long-term and short-term banking loans.

In short, while one is able to reject the hypothesised positive (negative) relationships between growth and short-term and (long-term and total) debt ratios in listed sample, one is unable to reject the negative relationships with long-term and total debt ratios in unlisted sample but not for the positive relationship with short-term debt.

7.3.7.8 Dividends

It appears that the influence of dividends on the capital structure of Saudi firms is insignificant other than the weak positive relationship with once is controlled for time-invariant heterogeneity. In listed sample, as seen in average regression, while the insignificant negative relationship between dividends and short-term debt remains insignificantly negative observed in pooled regression, the significant negative relationship with long-term and total debt levels turns into insignificant level once firm effects are controlled for. In unlisted sample, however, the insignificant negative relationship between dividends and total debt observed under pervious regressions turns into positive and significant at 5% level. This in turn is consistent with the

prediction of pecking order hypothesis. At disaggregate level, however, the associations with short-term and long-term debt ratios continue to be insignificant.

Accordingly, one is able to reject the hypothesised negative association between dividend payout ratio and debt in listed sample. In unlisted sample, on the other hand, one is able to reject the hypothesised positive association with debt elements other than the relationship with total debt where a significant positive relationship is observed.

7.3.7.9 Age

As seen in average regression, while the relationship between age and long-term debt continues to be significant, the negative significant at 5% relationships with short-term and total debt ratio observed under pooled regression turns into insignificant level in listed sample. As seen in size, liquidity and uniqueness variables, these results seem also to be driven by the some influential observations because the insignificant negative correlation with total and short-term debt turns into significant at 5% and 10% levels respectively under the reduced sample. In unlisted sample, the strong significant positive and negative relationships with short-term and long-term debt ratios respectively observed under pooled regressions are also obtained once firm effects are controlled for. However, the strong significant positive relationship between age and total debt seen under pooled regression turns into insignificant level. These results contradict those observed in average regression where the results show insignificant level of confidence.

In summary, under fixed effects regression where time-invariant heterogeneity is controlled for, one is able to reject the hypothesised relationship with debt elements in listed sample but fails to reject in unlisted sample other than the relationship with total debt where it is found insignificant.

7.4 Alternative proxies analysis

Previous analyses suggest that the interpretation and conclusions of the results is dependent on the estimation techniques being used. Moreover, it has also found in chapter three that attributes measurements are sensitive cases in determining the observed relationship. Accordingly, to investigate the sensitivity of the obtained results in the original models to the proxies employed, and to draw a general conclusion about the determinants of the capital structure, alternative proxies have been used. For the purpose of testing, only one alternative proxy is added at once in the original models and the other variables are not replaced. For example, when alternative proxy is used to measure size (i.e. log of total sales) in the models for both samples, all other variables are as originally stated. The importance of this process is that it allows capturing the influence not only on the relation between leverage and the alternative proxy but, also, capturing the impact on other variables in the model as the alternative proxy introduced to the model.

Moreover, since the results obtained by pooled and average techniques most likely are subject to over and under estimation bias respectively, the fixed effects technique where firm effects are controlled for is used in this analysis. As result, this process produces 27 models in listed sample and 24 models in

unlisted sample as tables illustrate in appendix 5. In general, the analysis reveals that all the models report significant F-test indicating the rejection of the null hypothesis of joint insignificance of the coefficients at less than 1% level.

7.4.1.1 Size

As the tables show, measuring size by natural logarithm of total sales has strong effect on the relationship between size and debt elements in listed sample. The insignificant positive relationship with total debt obtained under log of total assets proxy turns into positive and significant at 5% level under log of total sales proxy. Apparently, the results obtained at disaggregate level are the key issues. Indeed, the insignificant negative correlation with short-term debt observed under log of total assets proxy turns into positively significant at 1% level. Moreover, the positively significant at 10% level relationship with long-term debt becomes insignificant. In light of these evidences, one would infer that large companies in term of sales are not necessary large in term of assets at least in Saudi listed sample. Knowing that bank's long-term lending policy is linked to the assets companies have, the significant and insignificant positive relationship between log of sales and short-term and long-term debt ratios respectively may suggest that banks see these companies are small in term of assets. Therefore, these companies rely more on short-term bank borrowing to compensate for their restricted access to long-term bank loan.

Furthermore, measuring size by log of sales leads also to some changes in other variables. In short-term debt, while the weak negative association with

liquidity becomes insignificant, the insignificant association with age turns into significant at 5%. Moreover, driven by the increase in significant level of the negative relationship between ROA and long-term debt, the previous insignificant negative relationship between ROA and total debt becomes significant at 5%. In unlisted sample, on the other hand, there is no major change occurred on the relationship between size as measured by log sales and debt elements other than the decrease in the significant level to 5% with the relationship with short-term and total debt ratios. Some changes concerning the relationship between growth in assets and both short-term and long-term debt ratios as well as the relationship between uniqueness and total debt. However, the relationships in the former turn into insignificant while in the later the relationship becomes positive at 10% level.

7.4.1.2 Profitability

The alternative proxy of profitability is the return on sales (ROS). In listed sample, there is no major change observed in the relationship between profitability and debt elements other than the reverse sign of the insignificant relationship with short-term debt. Noteworthy, the insignificant negative relationship between market-to-book ratio and long-term debt observed under return on assets (ROA) turns into significant at 5% once return on sales (ROS) is used as a proxy for profitability. This result combined with the positive relationship with long-term debt indicates that these growing firms are small. However, the correlation matrix of listed sample in the appendix 7 reveals that the correlation between market-to-book ratio and ROA is considered relatively high (0.46) compared to the correlation with ROS (0.20). This most

likely indicates that the insignificant result observed under ROA is driven by this high correlation. Accordingly, the result observed under ROS concerning the relationship between market-to-book ratio and long-term debt lends support to the agency costs of debt as well as to the hypothesised relationship between growth opportunity and long-term debt.

In unlisted sample, on the other hand, employing ROS to measure profitability has significant impact on the relationship between profitability and debt elements. Under this proxy, no major change observed in the relationship between profitability and debt elements other than the reverse sign of the relationship with long-term debt. The relationships continue to be insignificantly negative with short-term and total debt ratios and insignificantly positive with long-term debt.

7.4.1.3 Tangibility

The ratio of fixed assets and inventory scaled by total assets is used as alternative measure of tangibility. In both samples, the relationship between tangibility and debt elements remains unchanged. However, the relationship between liquidity and short-term debt becomes insignificant in listed sample.

7.4.1.4 Liquidity

Current ratio that is the ratio of current assets to current liabilities is used as alternative proxy for liquidity. In both samples, the relationship between liquidity and debt elements remains unchanged. However, using current ratio as proxy for liquidity leads to a change in the relationship between ROA and

total debt in listed sample where the insignificant negative relationship becomes significant at 10% level.

7.4.1.5 Uniqueness

A dummy variable is used as alternative proxy for uniqueness. As the results show the only changes are observed in listed sample in particular with total debt ratio. The previous insignificant positive relationship between uniqueness and total debt becomes significant at 5% under unique dummy variable. However, the result remains inconsistent with Titman's (1984) argument that suggests uniqueness is negatively correlated with debt. As seen with size and liquidity, the increase in significant level of the negative relationship between ROA and long-term debt turns the previous insignificant negative relationship between ROA and total debt into significant at 5%.

7.4.1.6 Growth

While both growth in sales and the growth in assets are employed as alternative proxies (to M/B ratio) of growth opportunities in the listed sample, growth in sales is used as an alternative proxy (to growth in assets) in unlisted sample. In listed sample, while using growth in sales does not change the results in short-term debt model, it does cause significant changes in long-term and total debt models. In long-term debt, the relationship with growth in sales turns into positively significant at 5% and the significant level of the relationship with ROA increase into 1% level of significance while the positive relationship with size becomes insignificant. These changes lead to observed positive and significant at 10% and negative and significant at 5% and reverse sign in the relationships between (growth in sales, ROA and size

respectively) and total debt. However, the significant weak and moderate positive relationship between growth in sales and total and long-term debt ratios respectively are consistent with meta-analysis findings. About 65% and 87% of the significant results show positive relationship between growth in sales and total and long-term debt ratios respectively. In unlisted sample, the relationships between growth in sales and debt elements turn into insignificant levels with reverse sign observed with long-term debt.

On the other hand, it seems the effect of the growth in assets, as second alternative proxy in listed sample on the relationship between growth and debt elements is marginal. The results remain insignificant but with reverse signs observed in the relationship with total and long-term debt ratios. However, some major changes are observed in some other variables. The 10% significant level of the negative relationship between liquidity and short-term debt becomes significant at 5% level. This in turn leads to turn the insignificant negative relationship between liquidity and total debt into significant at 10% level. As observed with size, liquidity and growth in sales, the increase in the significant (from 5% to 1% level) of the negative relationship between ROA and long-term debt turns the previous insignificant negative relationship between ROA and total debt into significant at 5%. However, the relationship between size and long-term debt turns into insignificant which in turn leads to a reverse sign in the insignificant relationship with total debt.

Using the growth in sales as an alternative measures of growth in unlisted sample, however, turnover the relationship with long-term debt from

significant negative into significant positive and with total debt from significant negative into insignificant. This, however, is consistent with previous study findings, which found positive relationship between long-term debt and growth in sales. The overall direction implies that while growth appears to have insignificant impact on debt ratios in listed sample, it has strong negative association with short-term and total debt and moderate negative relationship with long-term debt in unlisted sample.

7.4.1.7 Dividends

The dummy variable is used as alternative proxy to measure to capture the impact of the dividends on debt levels of which company that report dividends is given one and zero other wise. In listed sample, the impact of the alternative proxy on the relationship between dividends and debt elements is insignificant. However, the insignificant negative relationship between ROA and total debt becomes significant at 10% level. In unlisted sample, on the other hand, the positively significant at 5% relationship between dividends and total debt turns into insignificant level under the alternative proxy.

7.4.1.8 Age

The number of year since establishment is used as alternative proxy to capture the effect of age on debt ratios. While the effect of this alternative proxy seems to be insignificant on the results in listed sample, it dose effect the results in unlisted sample. Under this proxy, the positively significant at 1% level relationship between age and short-term debt observed under log age remains significant but at 5%, which in turn leads us to continue observing insignificant relationship between age and total debt but with reverse sign.

Moreover, under this proxy, the insignificant positive relationship between dividends and short-term debt becomes significant at 10% level.

7.5 Regression diagnostics

Rajan and Zingales (1995) and Bevan and Danbolt (2002) find that the ordinary least squares (OLS) results are very similar to those obtained by employing TOBIT technique. Consistent with the finding of these two studies, the table in the appendix 6 shows that the results are extremely robust to those obtained by employing Tobit techniques. Accordingly, Pooled regression, in particular, OLS estimation technique is used in this section due to the fact that it provides more options than TOBIT technique to test for issues such as heteroskedasticity and influential observations.

The fact the data is a cross-section raises the issue of the heteroskedasticity. The Breusch-Pagan/Cook-Weisberg test is used in the present study to test for heteroskedasticity. The probability associated with this test is reported in the bottom row at the result's table. The results show the presence of heteroskedasticity at 1% level of significance in all models and in both samples. Accordingly, the reported significant levels for the regression coefficients are corrected from heteroskedasticity using White's heteroskedastic-consistent covariance matrix estimation, which is a default procedure to obtain robust standard errors in STATA.

Moreover, since the data involves cross section and time-series, it raises the suspicion about the existent of both heteroskedasticity and autocorrelation issues. Accordingly, it is worth to check for the robustness of the results using

the appropriate technique that is consistent in the presence of such disturbances. Since Newey-West estimator with a lag length of zero is equivalent to a White's heteroscedastic covariance estimator, it is consistent in the presence of both heteroskedasticity and autocorrelation with a lag length greater than zero. Greene (2000) suggests that the Newey-West estimator is consistent in the presence of both heteroskedasticity and autocorrelation disturbances. Accordingly, Newey-West estimator with one lag is employed here and the results are shown in the table at appendix 6. As it can be seen from the table, while the coefficient sizes remain unchanged the change occurred only to the standard errors, which cause the level of significance to change. While eight changes are observed in listed sample, three are observed in unlisted sample. The shaded area highlights these changes. However, two out of the three changes observed in unlisted sample in particular the relationship between both manufacturing and farming dummies with total debt turns into insignificant level. Despite of the changes observed in other variables, the relationships of these variables with debt elements remain significant. Accordingly, it seems that the influence of the autocorrelation is minimal.

Furthermore, testing for multicollinearity is also carried out through the variance inflation factor (VIF) and the pair-wise correlation matrix. Table 7.4 reports the VIF values for both listed and unlisted firms. Under this test, VIF value greater than 10 indicates multicollinearity problem (Gujarati, 2003). From this table it can be confirmed that multicollinearity is not an issue since the VIF values are far below the cut-off point. However, the alternative

proxies' analysis reveals that the multicollinearity issue most likely exists among some variables in particular in listed sample. A good example for the presence of multicollinearity is the changed in the significant level of the relationship between market-to-book and long-term debt ratios observed in listed sample once ROS is employed as alternative proxy to ROA. Accordingly, the interpretations and conclusions of the results should be taken with caution. The pair-wise correlation matrixes for listed and unlisted samples are presented in the tables respectively in the appendix 7.

Finally, the normality assumption of the regressions residuals is checked using the normal Probability plot (NPP) of the residuals. The figures in the appendix 9 show that the plots derived from the regression models' residuals are almost straight line. Gujarati, (2003) argues that, in general, if the fitted line in the NPP is approximately a straight line, one can conclude that the residuals are normally distributed. Accordingly, in to a large extent, the normality assumption holds in the present study.

7.6 Chapter summary

This chapter show that the surrounding socio-culture and institutional characteristics in Saudi Arabia have significant impact on the firms' financing choices. Generally, issues such as growth in stock market, weak legal system, zakat and barriers imposed on bond issuance combined with banks' borrowing being the only source for debt play an important role in the preference of equity over debt among Saudi listed firms compared to firms in developed countries. Moreover, a remarkable difference between the capital choices of

listed firms and unlisted firms is also observed. Surprisingly, the data shows that listed firms generally have a lower level of total debt than unlisted firms do. However, at the disaggregate level, the data shows that unlisted firms have higher short-term debt but substantially lower amounts of long-term debt than listed firms.

Moreover, the analyses show that the robustness of the results is limited due to reasons other than ones asserted by theory. Issues such as the choice of estimation technique or the choice of proxy are found to have an impact on the results. Indeed, the analysis shows that failing to control for time-invariant heterogeneity most likely lead to inherent biases such as overestimation bias in case of pooled regression or underestimation bias in case of average regression. The analysis reveals also that the relationships between some attributes and debt elements are dependent on the proxy being employed to capture the effect of certain attribute.

Nevertheless, the analysis shows that some factors affecting firms' capital structure in western countries' environments also have similar effects on firms' capital structure in Saudi Arabia despite the profound institutional differences between the two environments.

Chapter 8: Conclusion

8.1 Introduction

Since the seminal work of Modigliani and Miller (1958), the search for understanding capital structure choice continues to be an important area of research. In their efforts to understand the incentives for a firm to use debt, finance scholars have developed various theories and models. Each theory has explained facts about one or more factors that might determine a firm's capital structure. However, the findings of prior empirical studies have provided confusing evidence related to the impact of these factors on capital structure. Moreover, the majority of these studies have been conducted in western economies that have many institutional similarities. However, our knowledge of capital structure within developing countries that often have different institutional characteristics remains limited due to the lack of work that has been done in these countries. Also, a major gap in the empirical research of firms' capital structure determinants is the lack of research using unlisted firms data.

This dissertation explores these issues, firstly through conducting a meta-analysis of prior studies, and secondly by investigating firms' capital structure determinants in Saudi Arabia using listed and unlisted firms' data, as well as employing different estimation techniques and proxies.

Section 8.2 summarises the main findings of the meta-analysis of prior studies and some potential limitations. Section 8.3 summarises the main results from the empirical analysis of the determinants of firm's capital structure in Saudi Arabia. Section 8.4 outlines suggestions for future research.

8.2 Summary of the major results

8.2.1 Meta-analysis findings

In order to open the way for new ideas to identify the driving forces responsible for the apparent variation in the findings of prior capital structure studies, meta-analysis procedure is conducted in this dissertation. In general, it is found that issues such as measurement of both leverage and the explanatory variables have a significant impact on the variation in the findings of prior empirical studies. The analysis shows that size, tangibility, and profitability have consistent direction and strong relationship regardless of the measurement issue. However, the results reveal that the direction of the relationship between leverage and attributes such as effective tax rate, non-debt tax shields (NDTS), growth, uniqueness, dividends and age is sensitive to measurement of both leverage and the explanatory variables. For some attributes (risk, free cash flow, liquidity, and government ownership), the measurement differences influence the strength of relationship but not the direction. The overall impact of the factors considered important by many studies on leverage is summarised in Table 8.1.

As the table shows, prior empirical evidence for the two main capital structure theories is mixed. While factors such as risk, NDTS, uniqueness, dividends, age, and government lend support to the trade-off theory, factors such as profitability, free cash flow, and liquidity are found to provide strong support to the pecking order hypothesis. Expectations from both theories are the same for size, tangibility and growth and these are strongly evidenced in prior studies.

Table 8.1: **Results of the factors affecting capital structure.**

Attribute	Prediction		Number of studies	Finding	Significant
	TOT	POH			
Size	+	+	488	+	0.0000
Tangibility	+	+	266	+	0.0000
Profitability	+	-	511	-	-0.0000
Risk	-		262	-	-0.0000
Effective tax rate	+		190	Insignificant	0.4951
NDTS	-		150	-	-0.0000
Growth	-	-	473	-	-0.0000
Uniqueness	-		94	-	-0.0000
Dividends	-	+	53	-	-0.0000
Free cash flow	+	-	37	-	-0.0000
Liquidity		-	119	-	-0.0000
Age	+	-	36	+	0.0000
Government	+ / -		27	-	-0.0000

Note: TOT and POH refer to trade off theory and pecking order hypothesis respectively.

8.2.2 Limitation of meta-analysis

While the overall consistency of results is impressive the findings need to be interpreted with an element of caution. The analysis ignores the different definitions used in measuring the dependent variable (such as scaling debt either by assets or equity) and some explanatory variables (such as time length in measuring earnings variability and growth in both assets and sales) as well as differences in research methods (such as pooled, cross-sectional and panel data methods). Also, the sample includes working papers to avoid bias, so it is possible that large studies, in terms of sample size, with poor quality / reliability may have impacted the overall results. However, the stability of the results of meta-analysis depends on the number of studies being included in the sample. Since the number of studies included in the present meta-analysis is relatively large (140 studies), the majority of which are retrieved from

published journals (103 studies compared to 37 working paper studies), the concern is limited. Indeed, eliminating the working paper studies, in particular, those with large sample size does not affect the overall conclusion. Such issues are shared by many studies employing the meta-analysis technique (e.g. Borkowski, 1996 and Ahmed and Courtis, 1999), and the limitations must be weighed against the benefits of the meta-analysis technique (Ahmed and Courtis, 1999).

Despite these limitations and concerns, the meta-analysis technique has considerable benefits over the traditional literature review when seeking to aggregate and clarify conclusions from prior studies.

8.3 Saudi firm's capital structure determinants

The limited number of cross-country studies (e.g. Rajan and Zingales, 1995; Booth et al., 2001; Giannetti, 2003; Hall et al., 2004; De Jong et al, 2007) confirms the importance of institutional factors in explaining cross-country capital structure differences. The present study identifies a significant difference between the capital choices of Saudi firms and firms in developed economies, in that Saudi firms have substantially lower amounts of debt. The 10.9% total book-debt level observed in listed companies is far below the figure in most developed countries. For example, in 1991, the mean of total book-debt level in the G-7 countries was 41% (37% and 29% in the United States and United Kingdom respectively) (Rajan and Zingales, 1995). It is also below to the average total book-debt level of 32% in Arab countries (Barakat and Rao, 2004). The substantially low amount of debt reflects the

fact that the Saudi listed companies are mainly financed by share capital rather than debt. The data of listed companies shows that equity constitutes 57% of their assets.

The main reasons that Saudi listed firms prefer equity to debt most likely reflect the institutional characteristics of Saudi Arabia and can be summarised as follows:

1. The sharp increase in the stock market (53.8%) over the period 2000 to 2004 encourages firms to use equity finance as much as possible. Baker and Wurgler (2002) argue that firms tend to raise substantial amounts of equity capital when the equity market is perceived to be more favourable.

2. Saudi Arabia has relatively weak legal protection for lenders/creditors and poor enforcement of the law compared to developed countries (assuming well-developed legal systems). This encourages banks, the major source of debt in Saudi Arabia, to impose costly conditions in their lending policy. On the other hand, individual shareholder protection is also quite weak in Saudi Arabia**.** Overall, however, it would appear that ordinary share capital is a relatively cheap source of finance in Saudi Arabia.

3. The corporate bond market is virtually non-existent due to the constraint imposed by company law on bond issuance; this states that the total amount of bonds issued by a company may not exceed paid up capital. Such a constraint inhibits the use of such debt instruments among Saudi firms.

4. The tax advantage of debt, crucial to trade-off theory, is very limited since the tax rate (zakat) imposed on firms is very low. Barakat and Rao (2004) argue that, in the non-tax Arab countries (including Saudi Arabia), the use of debt is no different from the use of equity. The payout on both is treated the same in the absence of tax advantages of debt for the corporation or tax advantage of equity for the investor. The authors found tax-Arab countries use more debt than non-tax-Arab countries.

A remarkable difference between the capital choices of listed and unlisted firms is also observed. The data shows that Saudi unlisted firms generally have a higher level of total debt than listed firms, comprised of relatively higher short-term debt but substantially lower amounts of long-term debt. This may reflect the fact that unlisted firms do not have access to the capital markets or easy access to long-term bank debt; hence, they have to rely on short-term debt to finance growth. This evidence is consistent with Titman and Wessels' (1988) argument that small firms can be more leveraged than large firms and may prefer to borrow short-term rather than long-term due to the lower costs with this alternative.

In investigating to what extent institutional characteristics influence capital structure determinants in Saudi Arabia, the results of the robust fixed effects model reveal that certain firm-specific factors, relevant to explaining capital structure in Western countries, are also relevant in Saudi despite its profound institutional differences. As suggested by the two leading theories (i.e. trade-off and pecking order), size and tangibility show a positive influence on leverage, in particular, long-term debt in both samples. These results are also

consistent with the previous findings (e.g. US: Friend and Lang, 1988; Frank and Goyal 2003; UK: Bennett and Donnelly, 1993; Bevan and Danbolt, 2002, 2004; Arab countries: Omet and Mashharawe, 2001; Barakat and Rao, 2004; Australia SMEs: Cassar and Holmes, 2003).

An interesting difference between listed and unlisted companies is the strength of the relationship with the size predictor variable. It is strongly significant (1%) for all debt measures for unlisted, but quite weakly significant (10%) and only for long-term debt for listed sample. This may reflect the fact that listed firms have lower financial distress than unlisted firms (1783 unlisted firms close down during the sample period compared to no listed firms). Rajan and Zingales (1995) state that size can be considered a proxy for the inverse probability of default and should be weak when the costs of financial distress are low. The weak relationship may also reflect the fact that listed firms prefer equity to debt finance because of the relatively lower costs associated with equity issuance as stated earlier. Titman and Wessels (1988) argue that the cost of issuing debt and equity is related to firm size.

The results also provide evidence consistent with pecking order theory. Profitability is found to be significantly negatively correlated with long-term debt in listed sample and with all debt levels in unlisted sample. This finding is consistent with findings of the vast majority of prior empirical studies (e.g. US: Baskin, 1989; Chang and Rhee, 1990; UK: Ozkan, 2001; Bevan and Danbolt, 2002, 2004; cross-country developed countries: Booth et al, 2001; Arab countries: Barakat and Rao, 2004; Omet and Mashharawe, 2001; unlisted and SMEs: Petersen and Rajan, 1994; Cassar and Holmes, 2003; Hall

et al, 2004). However, as indicated earlier, Saudi listed firms prefer finance their growth by equity rather than by debt argued to be due to market timing consideration and other Saudi institutional characteristics. Thus, Saudi listed firms seem to follow what might be called a "modified" pecking order in which retained profit is the first preferred source of funds, followed by equity, and lastly by debt.

Another support for the pecking order model is that liquidity is found to be significantly negatively correlated with both short-term and total debt in unlisted sample but only with short-term debt in listed sample. This finding is also consistent with Omet and Mashharawe (2001) and Ozkan (2001), as well as Bevan and Danbolt (2004), who argue that liquidity is an important determinant of short-term bank financing. Partial support for pecking order theory is also observed in the unlisted sample where dividends are found to be significantly positively correlated with total debt, consistent with Baskin (1989) and Adedeji (1998).

On the other hand, the trade-off model seems to have limited explanatory power in Saudi Arabia. Agency theory (an argument for the trade-off model) predicts that free cash flow should be positively related to debt levels. However, the results show a significant *negative* relationship between free cash flow and short-term and total debt as well as an insignificant relationship with long-term debt in both samples. These results are inconsistent with the use of debt to reduce the free cash flow (per agency theory) and, therefore, also inconsistent with trade-off theory. These results most likely reflect lower

agency costs related to government ownership in the listed firm sample and family ownership in the unlisted sample.

Some support for trade-off theory is observed in the significant negative relationship between growth and long-term debt in unlisted sample, consistent with agency costs of debt. On the other hand, the significant negative relationship between growth and short-term debt observed in the unlisted sample contradicts the positive relationship suggested by Myers (1977) and found by Hall et al (2004) for Italy, Portugal and UK samples and by Cassar and Holmes (2003) for Australian SMEs. In the listed sample, however, the relationship between market-to-book ratio (as a proxy for growth opportunities) and all debt ratios is insignificant. This suggests that the agency costs of debt in Saudi Arabia may be low due to directors' membership on both the board of directors of listed firms and of banks. Bevan and Danbolt (2004) also found, in their fixed effects analysis, insignificant associations between market-to-book ratio and both long-term and short-term debt ratios.

In regard to testing the sensitivity of the results to the estimation techniques used, pooled, average cross-sectional, yearly cross-sectional and panel data estimation techniques were conducted on the listed and unlisted data over the period 2000 to 2004. As shown in Table 8.2, the analyses of pooled and average TOBIT estimation techniques reveal that while pooled regressions have most likely suffered from overestimation bias, average regressions have probably suffered from underestimation bias.

Indeed, the analyses of pure yearly cross-sectional regressions show that the magnitude and significance of the coefficients vary from year to year indicating that the interpretations and conclusions are dependent on the timing of the observation. Accordingly, fixed effects panel data techniques are used, in which time-invariant heterogeneity is controlled. The table shows that controlling for time-invariant firm-specific heterogeneity bias (fixed effects models) overturns several of the results obtained under pooled and average techniques. Also, results using pooled estimation have relatively more explanatory power than those obtained by average or fixed effects estimation.

Table 8.2: **Comparison of pooled Tobit with averaged Tobit and fixed effects estimation results**

	Hypothesised signs			Pooled data			Average Cross-sectional			Fixed effects		
	STD	LTD	TD	STD	LTD	TD	STD	LTD	TD	STD	LTD	TD
Panel A: Listed sample												
LOGASSETS	+	+	+	0.016	*0.033***	*0.050***	*0.035***	*0.051***	*0.087***	-0.047	*0.050**	0.004
ROA	-	-	-	0.224***	*-0.227***	0.003	*0.314**	-0.086	0.228	-0.006	*-0.189***	-0.183
TANG	-	+	+	0.001	*0.086***	*0.086***	-0.036	0.026	-0.010	0.004	*0.104***	0.092
FCF	-	-	-	*-0.248***	-0.054	*-0.339***	*-0.512**	-0.145	*-0.657***	*-0.130***	-0.011	*-0.183***
QR	-	-	-	*-0.010***	-0.005	*-0.016***	*-0.018**	-0.009	-0.027	*-0.007**	-0.001	-0.008
UNIQ	-	-	-	-0.014	-0.027	-0.055	-0.005	-0.197	-0.202	-0.016	0.213*	0.187
M/B	Ins.	Ins.	Ins.	-0.003	-0.006	-0.008	0.008	-0.011	-0.003	0.003	-0.007	-0.005
DIV	-	-	-	-0.009	*-0.024***	*-0.034***	-0.014	-0.031	-0.045	-0.001	-0.003	-0.003
LOGAGE	+	-	+	-0.048**	-0.026	-0.074**	-0.012	0.016	0.004	-0.126	0.032	-0.087
Risk	-	-	-	-0.001	0.003	0.002	-0.003	0.006	0.003	na	na	na
GOV	-	-	-	*-0.085***	-0.020	*-0.103***	*-0.087***	-0.034	*-0.121**	na	na	na
MINDUM	+	+	+	*0.040***	*0.067***	*0.109***	*0.031**	*0.053***	*0.084***	na	na	na
CEMEDUM	+	+	+	*0.032***	*0.044***	*0.081***	*0.053**	0.034	*0.087**	na	na	na
FARMDUM	?	?	?	-0.008	-0.016	-0.023	0.017	0.011	0.028	na	na	na
Panel B: Unlisted sample												
LOGASSETS	+	+	+	*0.059***	*0.019***	*0.092***	*0.062***	*0.016***	*0.090***	*0.066***	*0.024***	*0.097***
ROA	-	-	-	*-0.046***	*-0.040***	*-0.118***	-0.032	-0.030	-0.068	*-0.082***	*-0.014**	*-0.119***
TANG	-	+	+	*-0.115***	*0.092***	0.035	*-0.136***	*0.078***	-0.009	-0.030	*0.048***	0.051
FCF	-	-	-	*-0.124***	*-0.011***	*-0.144***	*-0.274***	*-0.064***	*-0.366***	*-0.110***	-0.002	*-0.119***
QR	-	-	-	*-0.032***	*0.002**	*-0.028***	*-0.031***	0.003	*-0.023***	*-0.020***	0.001	*-0.019***
UNIQ	-	-	-	0.001	0.049***	0.078	0.058	0.079*	0.140	-0.053	0.007	0.103
G. ASSETS	Ins.	Ins.	Ins.	*-0.044***	*-0.011***	*-0.067***	-0.004	-0.002	-0.043	*-0.025***	*-0.005***	*-0.034***
DIV	+	+	+	-0.002	-0.002	-0.005	0.003	-0.001	-0.003	0.003	0.001	*0.005***
LOGAGE	+	-	+	*0.081***	*-0.020***	*0.055***	0.071	-0.011	0.068	*0.095***	*-0.044***	0.006
Risk	-	-	-	0.0001**	0.0001	0.0001*	0.0001**	0.0001	0.0001*	na	na	na
MINDUM	+	+	+	0.005	*0.016***	*0.019**	-0.001	0.009	0.001	na	na	na
FARMDUM	?	?	?	-0.028	-0.001	-0.052**	-0.023	0.007	-0.031	na	na	na

It is also found that the influence of alternative proxies on the results can be as important as the influence of differences in estimation techniques. For example, although the relationship between profitability and debt elements remains unchanged, using return on sales (ROS) as an alternative proxy for profitability changes the insignificant negative relationship between market-to-book and long-term debt into significant for listed firms. This result combined with the negative relationship already observed between growth in assets and debt elements for unlisted firms provides strong support to costs of debt agency theory.

8.3.1 Limitation of the determinants analysis

The relatively small size of the listed sample may have limited the explanatory power of the regression models. Also, as with all research studies, care has to be exercised when seeking to generalise. The results depend upon the time period of investigation and its specific environmental characteristics. Notably, Saudi Arabia has been undergoing a period of rapid expansion in its stock market but bond markets are not yet developed. Despite these limitations, the results have provided valuable information about the determinants of capital structure of listed and unlisted companies in Saudi Arabia.

8.4 Suggestion for future research

This dissertation has triggered some topics for future research, referred to in limitation subsections. The following is a summary of the important issues that should be considered in future research:

The ignored different definitions in measuring both dependent and independent variables due time consideration or lack of data should be considered in future meta-analysis studies.

Factors such as differences in estimation techniques, the country of the study, period of the study are potential factors that need to be also tested.

Conducting different meta-analysis method such as effect size meta-analysis is recommended to check the robustness of the finding.

It would be useful to investigate behaviours more directly by conducting studies based on interviews, questionnaire surveys and case studies.

The percentage held by large shareholder other than government will be of great benefit when the data is available.

Though the finding provides some evidence supporting pecking order hypothesis, an appropriate test similar to Shyam Sunder and Myers (1999) is recommended.

Volatility, growth in assets and growth in sales need to be retested under longer-term period when the data is available.

Finally, it was hoped that the findings of this study might inform regulator bodies, academics and other researchers in general in Saudi Arabia. The analysis reveals that Saudi companies are missing an important debt instrument, bond debt. This absence limits the financing choice for companies, which in turn may inhibit their growth. Accordingly, it is strongly recommended that constraints related to bond issuance imposed on firms by

company law should be considered for removal. The potential success for such instruments is very promising since Islamic law provides alternative corporate bonds such as Sukuk Al Ijarah that are gaining popularity in other Muslim countries (e.g. Malaysia, Qatar and United Arab emirates)[22].

The other recommendation is the establishment of a database containing data about Saudi companies. The existence of such a database will encourage academics and other researchers to conduct research not only in finance but in the business area in general. Accordingly, it is hoped that the database assembled by the author may form the foundation for such a database.

[22] According to Tariq (2004), Ijarah Sukuk is a certificate that is issued on stand-alone assets identified on the balance sheet. The assets can be parcels of land to be leased or leased equipment such as aircrafts and ships. The rental rates of returns on these Sukuk can be both fixed and floating depending on the particular originator.

References

Adedeji, A. (1998), "Does the Pecking Order Hypothesis Explain The Dividend Payout Ratios Of Firms In The UK?", *Journal of Business Finance and Accounting*, Vol. 25, No. 9/10, pp. 1127-1155.

Ahmed, K. and Courtis, J. (1999), "Associations between Corporate Characteristics and Disclosure Levels in Annual Reports: A Meta-Analysis", *British Accounting Review*, Vol. 31, No. 1, pp. 35-61.

Aivazian, V., Ge, Y., and Qiu, J. (2005), "The Impact of Leverage on Firm Investment: Canadian Evidence", *Journal of Corporate Finance*, Vol. 11, No. 1-2, pp. 277-291.

Akhtar, S. (2005), "The Determinants of Capital Structure for Australian Multinational and Domestic Corporations", *Australian Journal of Management*, Vol. 30, No. 2, pp. 321-341.

Akhtar, S. and Oliver, B. (2006), "The Determinants of Capital Structure for Japanese Multinational and Domestic Corporations", *Australian National University*, Working Paper.

Allayannis, G., Brown, G., and Klapper, L. (2003), "Capital Structure and Financial Risk: Evidence from Foreign Debt Use in East Asia", *Journal of Finance*, Vol. 58, No. 6, pp. 2667-2710.

Allen, D. E. (1993), "The Pecking Order Hypothesis: Australian Evidence", *Applied Financial Economics*, Vol. 3, No. 2, pp. 101-112.

Allen, D. and Mizunot, H. (1989), "The Determinants of Corporate Capital Structures: Japanese Evidence", *Applied Economics*, Vol. 21, No. 5, p. 569.

Allen, D. (1991), "The Determinants of the Capital Structure of Listed Australian Companies: the Financial Manager's Perspective", *Australian Journal of Management*, Vol. 16, No. 2, pp. 103-28.

Allen, M. (1995), "Capital Structure Determinants in Real Estate Limited Partnerships", *Financial Review*, Vol. 30, No. 3, pp. 399-426.

Almazan, A. and Molina, C. A. (2005), "Intra-Industry Capital Structure Dispersion", *Journal of Economics and Management Strategy*, Vol. 14, No. 2, pp. 263-297.

Al-Sayari, H. (2003) "Saudi Arabian Banking System and Capital Markets", Saudi British forum, London.

Alti, A. (2006), "How Persistent Is the Impact of Market Timing on Capital Structure? ", *Journal of Finance*, Vol. 61, No. 4, pp. 1681-1710.

Alves, P. F. and Ferreira, M. A. (2007), "Capital Structure and Law around the World", *SSRN*, ID: 870845.

Antoniou, A., Guney, Y., and Paudyal, K. N. (2008), "Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions", *Journal of Financial and Quantitative Analysis,* Vol. 43, No.1, pp. 59-92..

Baker, M. and J. Wurgler (2002), "Market Timing and Capital Structure", *Journal of Finance*, Vol. 57, No. 1, pp. 1-30.

Bakheet, B. (1999) "Developing GCC Stock Markets: The Private Sector Role", *Middle East Policy*, February, Vol. 6, No.3, pp. 72-77.

Balakrishnan, S. and Fox, I. (1993), "Asset Specificity, Firm Heterogeneity and Capital Structure", *Strategic Management Journal*, Vol. 14, pp. 3-16.

Baltagi, B. H. (1995), "Econometric Analysis of Panel Data", Chichester, New York, Wiley.

Bancel, F. and Mittoo, U. (2004), "Cross Country Determinants of Capital Structure Choice: A Survey of European Firms", *Financial Management*, Vol.33, No. 4, pp. 103-132.

Barakat, M and Rao, R. (2004), "The Role of Taxes in Capital Structure: Evidence from Taxed and Non-Taxed Arab Economies", *FMA, New Orleans meeting*, working paper.

Barclay, M. J., Smith C. W. and Watts, R. (1995), "The Determinants of Corporate Leverage and Dividend Policies", *Journal of Applied Corporate Finance*, Vol. 7, No. 4, pp. 4–19.

Barclay, M., Marx, L. and Smith C. (2003), "The Joint Determination of Leverage and Maturity", *Journal of Corporate Finance*, Vol. 9, No. 2, pp. 149– 167.

Barry, P., Sotomayor, N., and Bierlen, R. W. (2000), "Financial Structure of Farm Businesses Under Imperfect Capital Markets", *American Journal of Agricultural Economics*, Vol. 82, No. 4, pp. 920-933.

Basheikh A, (2002), "Financial reporting in Saudi Arabia and bank lending decision", University *of Portsmouth*, Phd theses.

Baskin, J. (1989), "An Empirical Investigation of the Pecking Order Hypothesis", *Financial Management*, Vol. 18, No. 1, pp. 26-35.

Beattie, V., Goodacre, A., and Thomson, S. (2006), "Corporate Financing Decisions: UK Survey Evidence", *Journal of Business Finance and Accounting*, Vol. 33, No. 9/10, pp. 1402-1434.

Bennett, M. and Donnelly, R. (1993), "The Determinants of Capital Structure: Some UK Evidence", *British Accounting Review*, Vol. 25, No. 1, pp. 43–59.

Berger, P., Ofek, E., and Yermack, D. (1997), "Managerial Entrenchment and Capital Structure Decisions", *Journal of Finance*, Vol. 52, No. 4, pp. 1411-1438.

Bevan, A. and Danbolt, J. (2002), "Capital Structure and its Determinants in the UK: A Decompositional Analysis", *Applied Financial Economics*, Vol. 12, No. 3, pp. 159-170.

Bevan, A., and J. Danbolt (2004), "Testing for Inconsistencies in the Estimation of UK Capital Structure Determinants", *Applied Financial Economics*, Vol. 14, No. 1 (January), pp. 55-66.

Bhaduri, S. (2002), "Determinants of Capital Structure Choice: A Study of the Indian Corporate Sector", *Applied Financial Economics*, Vol. 12, No. 9, pp. 655-665.

Billett, M., King, T., and Mauer, D. (2007), "Growth Opportunities and the Choice of Leverage, Debt Maturity, and Covenants", *Journal of Finance*, Vol. 62, No. 2, pp. 697-730.

Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V. (2001), "Capital Structures in Developing Countries", *Journal of Finance*, Vol. 56, No. 1, pp. 87-130.

Borkowski, S. (1996), "An Analysis (Meta-and Otherwise) of Multinational Transfer Pricing Research", *International Journal of Accounting*, Vol. 31, No. 1, pp. 39-53.

Boyle, G. and Eckhold, K. (1997), "Capital Structure Choice and Financial Market Liberalisation: Evidence from New Zealand", *Applied Financial Economics*, Vol. 7, pp. 427- 437.

Bradley, M., Jarrell, G., and Kim, E. (1984), "On the Existence of an Optimal Capital Structure: Theory and Evidence", *Journal of Finance*, Vol. 39, No. 3, p. 857.

Brailsford, T., Oliver, B., and Pua, S. (2002), "On the Relation between Ownership Structure and Capital Structure", *Accounting and Finance*, Vol. 42, No. 1, pp. 1-26.

Brander, J. and Lewis, T. (1986), "Oligopoly and Financial Structure: The Limited Liability Effect", *American Economic Review*, Vol. 76, No. 5, pp. 965-970.

Bulan L. and Sanyal P. (2006), "Is There Room for Growth? Debt, Growth Opportunities and the Deregulation of U.S. Electric Utilities", *Brandeis University*, Working Paper.

Burgman, T. A. (1996), "An Empirical Examination of Multinational Corporate Capital Structure", *Journal of International Business Studies*, Vol. 27, No. 3, pp. 553-570.

Cassar, G. and Holmes, S. (2003), "Capital Structure and Financing of SMEs: Australian Evidence", *Accounting and Finance*, Vol. 43, No. 2, pp. 123-147.

Chang, R. and Rhee, S. (1993), "The Impact of Personal Taxes on Corporate Dividend Policy and Capital Structure Decisions", *Financial Management*, Vol. 19, No.2, pp.21-31.

Chen, J. J. (2004), "Determinants of Capital Structure of Chinese-Listed Companies", *Journal of Business Research*, Vol. 57, No.12, pp. 1341-1351.

Chen, L. and Zhao, X. (2006), "On the Relation between the Market-to-Book Ratio, Growth Opportunity, and Leverage Ratio", *Finance Research Letters*, Vol. 3, No. 4 pp. 253-66.

Chen, L., Lensink, R. and Sterken, E. (1998), "The Determinants of Capital Structure: Evidence from Dutch Panel Data", *European Economic Association Annual Congress*, Working Paper.

Chen, Y., and Hammes, K. "Capital Structure Theories and Empirical Results: A Panel Data Analysis", *SSRN,* ID: 535782.

Chirinko, R. S. and Singha, A. R. (2000), "Testing Static Tradeoff against Pecking Order Models of Capital Structure: A Critical Comment", *Journal of Financial Economics*, Vol. 58, No. 3, pp. 417-425.

Chung, K. H. (1993), "Asset Characteristic and Corporate Debt Policy: An Empirical Test", *Journal of Business Finance and Accounting*, Vol. 20, No. 1, pp. 83-98.

Chun-Hung T. and Jang S. (2007), "Revisit to the Determinants of Capital Structure: A Comparison between Lodging Firms and Software Firms", *International Journal of Hospitality Management*, Vol. 26, No. 1, pp. 175–187.

Colombo, E. (2001), "Determinants of Corporate Capital Structure: Evidence from Hungarian Firms", *Applied Economics*, Vol. 33, No. 13, pp. 1689-1701.

Cooper, H. (1998), "Synthesizing Research: a Guide for Literature Reviews", 3rd ed. Sage.

Crutchley, C. E. and Hansen, R. S. (1989), "A Test of the Agency Theory of Managerial Ownership, Corporate Leverage, and Corporate Dividends", *Financial Management*, Vol. 18, No. 4, pp. 36-46.

De Jong, A. (2002), "The Disciplining Role of Leverage in Dutch Firms", *European Finance Review*, Vol. 6, No. 1, pp. 31-62.

De Jong, A. and Veld, C. (2001), "An Empirical Analysis of Incremental Capital Structure Decisions Under Managerial Entrenchment", *Journal of Banking and Finance*, Vol. 25, No. 10, pp. 1857-1895.

De Jong, A., Kabir, R., and Nguyen, T. T. (2007), "Capital Structure around the World: The Roles of Firm- and Country-Specific Determinants", *Journal of Banking & Finance,* forthcoming. .

De Medeiros, O. R. and Daher, C. E. (2004), "Testing Static Trade-off against Pecking Order Models of Capital Structure in Brazilian Firms", *SSRN,* ID: 631563.

De DeMiguel, A. and Pindado, J. (2001), "Determinants of Capital Structure: New Evidence from Spanish Panel Data", *Journal of Corporate Finance*, Vol. 7, No. 1, pp. 77-99.

DeAngelo, H. and Masulis, R. W. (1980), "Optimal Capital Structure under Corporate and Personal Taxation", *Journal of Financial Economics*, Vol. 8, No. 1, pp. 3-29.

Deesomsak, R., Paudyal, K., and Pescetto, G. (2004), "The Determinants of Capital Structure: Evidence from the Asia Pacific Region", *Journal of Multinational Financial Management*, Vol. 14, No. 4-5, pp. 387-405.

Desai, M. A., Foley, C., and Hines, J. R. (2004), "A Multinational Perspective on Capital Structure Choice and Internal Capital Markets", *Journal of Finance*, Vol. 59, No. 6, pp. 2451-2487.

Dessi, R. and Robertson, D. (2003), "Debt, Incentives and Performance: Evidence from UK Panel Data", *Economic Journal*, Vol. 113, No. 490, pp. 903-919.

Diamond, D.W., (1989), "Reputation Acquisition in Debt Markets", *Journal of Political Economy*, Vol. 97, pp.828-862.

Donaldson, G. (1961), "Corporate Debt Capacity: A Study of Corporate Debt Capacity", *Boston, Division of Research, Harvard School of Business Administration*.

Doukas, J. A. and Pantzalis, C. (2003), "Geographic Diversification and Agency Costs of Debt of Multinational Firms", *Journal of Corporate Finance*, Vol. 9, No. 1, pp. 59-92.

Downs, T. W. (1993), "Corporate Leverage and Non-Debt Tax Shields: Evidence on Crowding-Out", *Financial Review*, Vol. 28, No. 4, p. 549.

Drobetz, D. and fix, R. (2005), "What Are the Determinants of the Capital Structure? Evidence from Switzerland", *Schweizerische Zeitschrift furkswirtschaft und Statistik,* Vol. 141, No.1, pp. 71–113.

Du, J. and Dai, Y. (2005), "Ultimate Corporate Ownership Structures and Capital Structures: evidence from East Asian economies", *Corporate Governance: An International Review*, Vol. 13, No. 1, pp. 60-71.

Dzolkarnaini, N. (2006), "Capital Control Regime and Capital Structure Determinants: A Malaysian Case", *Malaysian Accounting Review*, Vol. 5, No. 1, pp. 1-41.

Eriotis N. (2007), "How Firm Characteristics Affect Capital Structure: an Empirical Study", *Managerial Finance*, Vol. 33, No. 5, pp. 321-331.

Esperança, J., Gama, P. and Gulamhussen, M. (2003), "Corporate Debt Policy of Small Firms: An Empirical (Re) Examination", *Journal of Small Business and Enterprise Development*, Vol. 10, No. 1, pp. 62-80.

Fama, E. F. and French, K. R. (2002), "Testing Trade-Off and Pecking Order Predictions about Dividends and Debt", *Review of Financial Studies*, Vol. 15, No. 1, pp. 1-33.

Fan, P. H. J., Titman, S., and Twite, G. J. (2006), "An International Comparison of Capital Structure and Debt Maturity Choices", *SSRN,* ID: 423483.

Fattouh, B., Harris, L., and Scaramozzino, P. (2005), "Non-Linearity in the Determinants of Capital Structure: Evidence from UK Firms", *SSRN*, ID: 789304.

Fischer, E. O., Heinkel, R., and Zechner, J. (1989), "Dynamic Capital Structure Choice: Theory and Tests", *Journal of Finance*, Vol. 44, No. 1, pp. 19-40.

Flannery, M. J. and Rangan, K. P. (2006), "Partial Adjustment toward Target Capital Structures", *Journal of Financial Economics*, Vol. 79, No. 3, pp. 469-506.

Frank, M. Z. and Goyal, V. K. (2003), "Testing the Pecking Order Theory of Capital Structure", *Journal of Financial Economics*, Vol. 67, No. 2, pp. 217-248.

Frank, M. Z. and Goyal, V. K. (2004), "Capital Structure Decisions: Which Factors are Reliably Important? ", *SSRN*, ID: 567650.

Fraser, D. R., Zhang, H., and Derashid, C. (2006), "Capital Structure and Political Patronage: The Case of Malaysia", *Journal of Banking and Finance*, Vol. 30, No. 4, pp. 1291-1308.

Frieder, L. and Martell, R. (2006), "On Capital Structure and the Liquidity of a Firm's Stock", *SSRN*, ID: 880421.

Friend, I. and Lang, L. H. P. (1988), "An Empirical Test of the Impact of Managerial Self-Interest on Corporate Capital Structure", *Journal of Finance*, Vol. 43, No. 2, pp. 271-281.

Frydenberg, S. (2003), "A Dynamic Model of Corporate Capital Structure", *SSRN*, ID: 394989.

Gatward, P. and Sharpe, I. G. (1996), "Capital Structure Dynamics with Interrelated Adjustment: Australian Evidence", *Australian Journal of Management*, Vol. 21, No. 2, pp. 89-112.

Gaud, P., Hoesli, M., and Bender, A. (2007), "Debt-Equity Choice in Europe", *International Review of Financial Analysis*, Vol. 16, No. 3, pp. 201-222.

Gaud, P., Jani, E., Hoesli, M., and Bender, A. (2005), "The Capital Structure of Swiss Companies: an Empirical Analysis Using Dynamic Panel Data", *European Financial Management*, Vol. 11, No. 1, pp. 51-69.

Giannetti, M. (2003), "Do Better Institutions Mitigate Agency Problems? Evidence from Corporate Finance Choices", *Journal of Financial and Quantitative Analysis*, Vol. 38, pp.185-212.

Glass, G. (1976), "Primary, Secondary, and Meta-Analysis of Results", *Educational Researcher*, Vol. 5, pp. 3-8.

Givoly, D. (1992), "Taxes and Capital Structure: Evidence from Firms' Response to the Tax Reform Act of 1986", *Review of Financial Studies*, Vol. 5, No. 2, pp. 331-355.

Graham, J. R. and Harvey, C. R. (2001), "The Theory and Practice of Corporate Finance: Evidence from the Field", *Journal of Financial Economics*, Vol. 60, No. 2-3, pp. 187-243.

Graham, J. R., Lemmon, M. L., and Schallheim, J. S. (1998), "Debt, Leases, Taxes, and the Endogeneity of Corporate Tax Status", *Journal of Finance*, Vol. 53, No. 1, pp. 131-162.

Greenberg, P. S. (1992), "The Use of Meta-Analysis Techniques in Developing Dissertation Proposals: Guidelines to Aid Supervising Faculty", *Issues in Accounting Education*, Vol. 7, No. 2, pp. 145-163.

Greene, W. H. (2000), "Econometric Analysis", Prentice Hall, Fourth Edition.

Grossman, S. and Hart, O. (1982), "Corporate Financial Structure and Managerial Incentives", in: McCall, J. (ed.), *Economics of Information and Uncertainty*, University of Chicago Press.

Gujarati, D. N. (2003), "Basic Econometrics", Irwin, Fourth Edition.

Gul, F. A. (1999), "Government Share Ownership, Investment Opportunity Set and Corporate Policy Choices in China", *Pacific-Basin Finance Journal*, Vol. 7, No. 2, pp. 157-172.

Hall, G., Hutchinson, P and Michaelas, N. (2004), "Determinants of the Capital Structures of European SMEs", *Journal of Business Finance and Accounting,* Vol. 31, No. 5&6, pp. 711-728.

Harris M. and Raviv, A. (1988), "Corporate Control Contests and Capital Structure", *Journal of Financial Economics,* Vol. 20, pp. 55-86.

Harris, M. and Raviv, A. (1990), "Capital Structure and the Informational Role of Debt", *Journal of Finance*, Vol. 45, No. 2, pp. 321–349.

Harris, M. and Raviv, A. (1991), "The Theory of Capital Structure", *Journal of Finance*, Vol. 46, No. 1, pp. 297-355.

Harvey, C. R., Lins, K. V., and Roper, A. H. (2004), "The Effect of Capital Structure When Expected Agency Costs Are Extreme", *Journal of Financial Economics*, Vol. 74, No. 1, pp. 3-30.

Heshmati, A. (2001), "The Dynamics of Capital Structure: Evidence from Swedish Micro and Small Firms", *Stockholm School of Economics*, Working Paper Series in Economics and Finance No. 440.

Hirota, S. (1999), "Are Corporate Financing Decisions Different in Japan? An Empirical Study on Capital Structure", *Journal of the Japanese and International Economies*, Vol. 13, No. 3, pp. 201-229.

Hogfeldt, P. and Oborenko, A. (2005), "Does Market Timing or Enhanced Pecking Order Determine Capital Structure?", *SSRN*, ID: 592501.

Homaifar, G., Zietz, J., and Benkato, O. (1994), "An Empirical Model of Capital Structure: Some New Evidence", *Journal of Business Finance and Accounting*, Vol. 21, No. 1, pp. 1-14.

Hovakimian, A. (2006), "Are Observed Capital Structures Determined by Equity Market Timing?", *Journal of Financial and Quantitative Analysis*, Vol. 41, No. 1, pp. 221-243.

Hovakimian, A., Opler, T., and Titman, S. (2001), "The Debt-Equity Choice", *Journal of Financial and Quantitative Analysis*, Vol. 36, No. 1, pp. 1-24.

Huang, G. and Song, F. M. (2006), "The Determinants of Capital Structure: Evidence from China", *China Economic Review*, Vol. 17, No. 1, pp. 14-36.

Hung, C., Albert, C. and Eddie H. (2002), "Capital Structure and Profitability of the Property and Construction Sectors in Hong Kong", *Journal of Property Investment and Finance*, Vol. 20, No. 6, pp. 434-453.

Hussain, Q. and Nivorozhkin, E. (1997), "The Capital Structure of Listed Companies in Poland", *SSRN*, ID: 883923.

International Monetary Fund (2006), "Saudi Arabia country report", Washington D.C, USA.

Israel, R. (1992), "Capital and Ownership Structures, and the Market for Corporate Control", *Review of Financial Studies*, Vol. 5, No. 2, pp 181-198.

Jalilvand, A. and Harris, R. S. (1984), "Corporate Behavior in Adjusting to Capital Structure and Dividend Targets: An Econometric Study", *Journal of Finance*, Vol. 39, No. 1, p. 127-145.

Jensen, G. R., Solberg, D. P., and Zorn, T. S. (1992), "Simultaneous Determination of Insider Ownership, Debt, and Dividend Policies", *Journal of Financial and Quantitative Analysis*, Vol. 27, No. 2, pp. 247-263.

Jensen, M. (1986), "Agency Cost of Free Cash Flows, Corporate Finance and Takeovers", *American Economic Review*, Vol. 76, No. 2, pp. 323–339.

Jensen, M. and Meckling, W. (1976), "Theory of the Firm: Managerial Behaviour, Agency Costs and Capital Structure", *Journal of Financial Economics*, Vol. 3, No. 4, pp. 305-360.

Jiraporn, P. and Gleason, K. C. (2007), "Capital Structure, Shareholder Rights, and Corporate Governance", *Journal of Financial Research*, Vol. 30, No. 1, pp. 21-33.

Joeveer, K. (2006), "Sources of capital structure: evidence from transition countries", *Bank of Estonia*, Working Papers No 2006-02.

Jordan, J., Lowe, J., and Taylor, P. (1998), "Strategy and Financial Policy in UK Small Firms", *Journal of Business Finance and Accounting*, Vol. 25, No. 1&2, pp. 1-27.

Kahle, K. M. and Shastri, K. (2005), "Firm Performance, Capital Structure, and the Tax Benefits of Employee Stock Options", *Journal of Financial and Quantitative Analysis*, Vol. 40, No. 1, pp. 135-160.

Kale, J. R. and Shahrur, H. K. (2007), "Corporate Capital Structure and the Characteristics of Suppliers and Customers", *Journal of Financial Economics*, Vol.83, No. 2, pp. 321-365.

Kayhan, A. and Titman, S. (2007), "Firms' Histories and Their Capital Structures", *Journal of Financial Economics*, Vol. 83, No. 1, pp. 1-32.

Kester, C.W. (1986), "Capital and Ownership Structure: A Comparison of United Studies and Japanese Manufacturing Corporations", *Financial Management*, Vol. 15, No. 1, pp. 5- 16.

Kim, H., Heshmati, A., and Aoun, D. (2006), "Dynamics of Capital Structure: The Case of Korean Listed Manufacturing Companies", *Asian Economic Journal*, Vol. 20, No. 3, pp. 275-302.

Klapper, L., Sarria-Allende, V. and Zaidi, R. (2006), "A Firm-Level Analysis of Small and Medium Size Enterprise Financing in Poland", *World Bank Policy Research,* Working Paper No. 3984.

Klein, D. P. and Belt, B. (1993), "Sustainable Growth and Choice of Financing: A Test of the Pecking Order Hypothesis", *Review of Financial Economics*, Vol. 3, No. 1-2, pp. 141-154.

Kyereboah, A. and Biekpe, N. (2006), "Corporate Governance and Financing Choices of Firms: A Panel Data Analysis", *South African Journal of Economics*, Vol. 74, No. 4, pp. 670-681.

La Porta, R., Florencio L. and Shleifer, A.(1999), "Corporate Ownership around the World", *Journal of Finance*, Vol. 54, No. 2, pp. 471-517.

Lasfer, M. A. (1995), "Agency Costs, Taxes and Debt: The UK Evidence", *European Financial Management*, Vol. 1, No. 3, pp. 265-285.

Lee, J. W., Lee, Y. S., and Lee, B. S. (2000), "The Determination of Corporate Debt in Korea", *Asian Economic Journal*, Vol. 14, No. 4, p. 333.

Leland, H. and Pyle, D. (1977), "Informational Asymmetries, Financial Structure and Financing Intermediation", *Journal of Finance*, Vol. 32, No. 2, pp. 371- 388.

Lemmon, M. L., Roberts, M. R., and Zender, J. F. (2006), "Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure", *SSRN*, ID: 881899.

Lord, R. A. and McIntyre, J. E. (2003), "Leverage, Imports, Profitability, Exchange Rates, and Capital Investment: A Panel Data Study of the Textile and Apparel Industries (1974)-(1987)", *International Review of Financial Analysis*, Vol. 12, No. 3, pp. 287-310.

Lowe, J., Naughton, T. and Taylor, P. (1994), "The Impact of Corporate Strategy on the Capital Structure of Australian Companies", *Managerial and Decision Economics,* Vol. 15, No. 3, pp. 245- 257.

MacKay, P. and Phillips, G. M. (2005), "How Does Industry Affect Firm Financial Structure?", *Review of Financial Studies*, Vol. 18, No. 4, pp. 1433-1466.

MacKie-Mason, J. (1990), "Do Taxes Effect Corporate Financing Decisions?", *Journal of Finance*, Vol. 45, No. 5, pp. 1471-1493.

Maddala, G.S. (1983). "Limited-Dependent and Qualitative Variables in Econometrics", *Econometric Society Monographs in Quantitative Economics,* Cambridge, University Press.

Maksimovic, V. (1988), "Capital Structure in Repeated Oligopolies", *Rand Journal of Economics*, Vol. 19, No. 3, pp. 389-407.

Manos, R., Green, C., and Murinde, V. (2001), "Business Groups and Capital Structure: Evidence on Indian Firms", *Institute for Development Policy and Management, University of Manchester,* Paper No 34.

Marsh, P. (1982), "The Choice between Equity and Debt: An Empirical Study", *Journal of Finance*, Vol. 37, No. 1, pp. 121- 144.

Mayer, C. and Sussman, O. (2004), "A New Test of Capital Structure", *Saïd Business School, University of Oxford*, Working paper.

Mehran, H., R.A. Taggart and D. Yermack (1999), 'CEO Ownership, Leasing and Debt Financing', *Financial Management*, Vol. 28, No. 2, pp. 5-15.

Mehrotra, V., Mikkelson, W., and Partch, M. (2005), "Do Managers Have Capital Structure Targets? Evidence from Corporate Spinoffs", *Journal of Applied Corporate Finance*, Vol. 17, No. 1, pp. 18-25.

Miller M.H. (1977), "Debt and Taxes", *Journal of Finance,* Vol. 32, No. 2, pp. 261-275.

Ministry of Commerce and Industry, (1999) "Corporate Law", *Ministry of Planning Press*, Riyadh, Saudi Arabia.

Ministry of Planning, (1990) "The Seventh Development Plan: 1990-1995", *Ministry of Planning Press*, Riyadh, Saudi Arabia.

Ministry of Planning, (1995) "The Seventh Development Plan: 1995-2000", *Ministry of Planning Press*, Riyadh, Saudi Arabia.

Ministry of Planning, (2000) "The Seventh Development Plan: 2000-2005", *Ministry of Planning Press*, Riyadh, Saudi Arabia.

Mitton, T. (2006), "Why Have Debt Ratios Increased for Firms in Emerging Markets?", *SSRN*, ID: 897581.

Modigliani, F. and Miller, M. H. (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review*, Vol. 48, No. 3, pp. 261-297.

Modigliani, F. and Miller, M. H. (1963), "Corporate Income Taxes and the Cost of Capital: A Correction", *American Economic Review*, Vol. 53, No. 3, pp. 433-443.

Moh'd, M. A., Perry, L. G., and Rimbey, J. N. (1998), "The Impact of Ownership Structure On Corporate Debt Policy: a Time-Series Cross-Sectional Analysis", *Financial Review*, Vol. 33, No. 3, pp. 85-98.

Molina C. (2005), "Are Firms Underleveraged? An Examination of the Effect of Leverage on Default Probabilities", *Journal of Finance*, Vol. 60, No. 3, 1427-1459.

Muller, E. (2005), "Benefits of Control, Capital Structure and Company Growth", *SSRN*, ID: 776364.

Mutenheri, E. and Green, C. (2002), "Financial Reform and Financing Decisions of Listed Firms in Zimbabwe", *Loughborough University*, *Economic Research Paper*, No. 02/5.

Myers, S. C. (1977), "Determinants of Corporate Borrowing", *Journal of Financial Economics*, Vol. 5, No. 2, pp. 147-175.

Myers, S. C. (1984), "The Capital Structure Puzzle", *Journal of Finance*, Vol. 39, No. 3, pp. 575-592.

Myers, S. C. and Majluf, N. (1984), "Corporate Financing Decisions and Investment Decisions When Firms Have Information That Investors Do Not Have", *Journal of Financial Economics*, Vol. 13, No. 2, pp. 187-221.

Nam, J., Ottoo, R. E., and Thornton, J. (2003), "The Effect of Managerial Incentives to Bear Risk on Corporate Capital Structure and RandD Investment", *Financial Review*, Vol. 38, No. 1, pp. 77-101.

Naser, K. (1998), "Investment Prospects in a Sample of Arab Stock Exchanges", *Emirates Occasional Papers*, (17), 1-42.

Nguyen, T. and Ramachandran, N. (2006), "Capital Structure in Small and Medium-sized Enterprises: The Case of Vietnam", *ASEAN Economic Bulletin*, Vol. 23, No. 2, pp. 192–211.

Nishioka, S. and Baba, N. (2004), "Dynamic Capital Structure of Japanese Firms: How Far Has the Reduction of Excess Leverage Progressed in Japan", *Bank of Japan,* Working Paper Series No.04-E-16.

Nivorozhkin, E. (2002), "Capital Structures in Emerging Stock Markets: the case of Hungary", *Developing Economies*, Vol. 40, No. 2, pp. 166-187.

Norton, E. (1989), "Determinants of Capital Structure: A Survey," *Advances in financial planning and forecasting.* Vol. 3, pp. 323-350.

Omet, G. and Mashharawe, F. (2001), "The Capital Structure Choice in Tax Contrasting Environments: Evidence from the Jordanian, Kuwaiti, Omani and Saudi Corporate Sectors", *Hashemite University*, Working Paper.

Ooi J. (1999), "The Determinants of Capital Structure Evidence on UK Property Companies", *Journal of Property Investment and Finance*, Vol. 17 No. 5, pp. 464-480.

Opler, T. C. and Titman, S. (1994), "Financial Distress and Corporate Performance", *Journal of Finance*, Vol. 49, No. 3, pp. 1015-1040.

Ozkan, A. (2001), "Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data", *Journal of Business Finance and Accounting*, Vol. 28, No. 1&2, pp. 175-198.

Petersen, M. A. and Rajan, R. G. (1994), "The Benefits of Lending Relationships: Evidence from Small Business Data". *Journal of Finance* 49, pp. 3–37.

Pindyck R. and Rubinfeld D. (1998), "Econometric Models and Economic Forecasts", Irwin, fourth edition.

Rajan, R. G. and Zingales, L. (1995), "What Do We Know about Capital Structure? Some Evidence from International Data", *Journal of Finance*, Vol. 50, No. 5, pp. 1421-1460.

Ramalho, J. J. S. and Vidigal Da Silva, J. (2007), "A Two-Part Fractional Regression Model for the Capital Structure Decisions of Micro, Small, Medium and Large Firms", *SSRN*, ID: 968017.

Rosenthal, R., "Meta-Analytic Procedures for Social Research", (1991), *Newbury Park*, *Sage*.

Ross, S. (1977), "The Determination of Financial Structure: The Incentive Signalling Approach", *Bell Journal of Economics*, Vol. 8, No. 1, pp. 23-40.

Sapar, N. R. and Lukose, P. J. (2002), "An Empirical Study on the Determinants of the Capital Structure of Listed Indian Firms", *SSRN*, ID: 433120.

Sarig, O.H. (1998), "The Effect of Leverage on Bargaining with Corporation", *Financial Review*, Vol. (33), No. 1, pp. 1-16.

Saudi Arabian Monetary Agency (1985), "Money and Banking Statistics", *SAMA*, Research and Statistics Department.

Saudi Arabian Monetary Agency (SAMA) (1995). "Money and Banking Statistics", *SAMA*, Research and Statistics Department.

Saudi British Bank, (2003), "Special Report on Saudi Banks", *SAAB*, Riyadh, Saudi Arabia.

Schmidt, F., Hunter, J. E., Pearlman, K., Hirsh, H., Sackett, P. R., Schmitt, N. E., Tenopyr, M. L., Kehoe, J., and Zedeck, S. (1985), "Forty Questions About Validity Generalization and Meta-analysis.", *Personnel Psychology*, Vol. 38, No. 4, pp. 697-798.

Shenoy, C. and Koch, P. (1996), "The Firm's Leverage-Cash Flow Relationship", *Journal of Empirical Finance*, Vol. 2, No. 4, pp. 307- 331.

Short, H., Keasey, K., and Duxbury, D. (2002), "Capital Structure, Management Ownership and Large External Shareholders: A UK Analysis", *International Journal of the Economics of Business*, Vol. 9, No. 3, pp. 375-399.

Shuetrim, G., Lowe, P. and Morling, S. (1993), "The Determinants of Corporate Leverage: A Panel Data Analysis", *Reserve Bank of Australia*, Working paper.

Shyam-Sunder, L. and Myers, S. C. (1999), "Testing Static Trade-off against Pecking Order Models of Capital Structure", *Journal of Financial Economics*, Vol. 51, No. 2, pp. 219-244.

Sogorb-Mira, F. (2001), "On Capital Structure in the Small and Medium Enterprises: The Spanish Case", *SSRN*, ID: 277090.

Sogorb-Mira, F. and Lopez-Gracia, J. (2003), "Pecking Order Versus Trade-off: An Empirical Approach to the Small and Medium Enterprise Capital Structure", *SSRN*, ID: 393160.

Song, H. (2005), "Capital Structure Determinants: An Empirical Study of Swedish Companies", *CESIS, Electronic Working Paper Series, Paper No.25.*

Smith, C. and Warner, J. (1979), "On Financing Contracting: An Analysis of Bond Covenants," *Journal of Financial Economics*, Vol. 7, pp. 117-161.

Stulz R. (1988), "Managerial Control of Voting Rights: Financing Policies and the Market for Corporate Control" *Journal of Financial Economics,* Vol. 20, pp. 25-54.

Stulz, R. (1990), "Managerial Discretion and Optimal Financing Policies", *Journal of Financial Economics*, Vol. 26, pp. 3-27.

Taggart, R. A., Jr. (1977), "A Model of Corporate Financing Decisions", *Journal of Finance*, Vol. 32, No. 5, pp. 1467-1484.

Tariq, A. (2004), "Managing Financial Risks of Sukuk Structures", *Loughborough University*, Unpublished master degree dissertation.

Theis, J. and Casey, M. (1999), "An Empirical Investigation of Agency Relationships and Capital Structure of Property Management Firms in the UK", *Journal of Property Investment and Finance*, Vol. 17, No. 1, pp. 27-34.

Thies, C. F. and Klock, M. S. (1992), "Determinants of Capital Structure", *Review of Financial Economics*, Vol. 1, No. 2, pp. 40-52.

Titman, S. (1984), "The Effect of Capital Structure on the Firm's Liquidation Decision", *Journal of Financial Economics*, Vol. 13, No. 1, pp. 137-151.

Titman, S. and Wessels, R. (1988), "The Determinants of Capital Structure Choice", *Journal of Finance*, Vol. 43, No. 1, pp. 1-19.

Tong, G. and Green, C. J. (2005), "Pecking Order or Trade-off Hypothesis? Evidence on The Capital Structure of Chinese Companies", *Applied Economics*, Vol. 37, No. 19, pp. 2179-2189.

Twite, G. (2001), "Capital Structure Choices and Taxes: Evidence from the Australian Dividend Imputation Tax System", *International Review of Finance*, Vol. 2, No. 4, pp. 217-234.

Voulgaris, F., Asteriou, D., and Agiomirgianakis, G. (2004), "Size and Determinants of Capital Structure in the Greek Manufacturing Sector", *International Review of Applied Economics*, Vol. 18, No. 2, pp. 247-262.

Wald, J. K. (1999), "How Firm Characteristics Affect Capital Structure: An International Comparision", *Journal of Financial Research*, Vol. 22, No. 2, p. 161.

Wanzenried G. (2002), "Capital Structure Dynamics in UK and Continental Europe", *University of Bern*, Working paper.

Wen, Y., Rwegasira, K., and Bilderbeek, J. (2002), "Corporate Governance and Capital Structure Decisions of the Chinese Listed Firms", *Corporate Governance: An International Review*, Vol. 10, No. 2, pp. 75-83.

Wi, S. K. and Sorensen, E. H. (1986), "Evidence on the Impact of the Agency Costs of Debt on Corporate Debt Policy", *Journal of Financial and Quantitative Analysis*, Vol. 21, No. 2, p. 131.

Wiwattanakantang, Y. (1999) "An Empirical Study on The Determinants of the Capital Structure of Thai Firms", *Pacific-Basin Finance Journal*, Vol. 7, pp. 371–403.

Wolf, F. M. (1986), "Meta-Analysis: Quantitative Methods For Research Synthesis", *Beverly Hills, Sage Publications*.

Yan, A. (2006), "Leasing and Debt Financing: Substitutes or Complements?", *Journal of Financial and Quantitative Analysis*, Vol. 41, No. 3, pp. 709-731.

Yu, H. C. (2000), "Banks Capital Structure and the Liquid Asset Policy Implication of Taiwan", *Pacific Economic Review*, Vol. 5, pp. 109-114.

Yu, H. C. (2003), "Public Debt, Bank Debt and Non-bank Private Debt and Firm Characteristics among Taiwanese Listed Companies", *SSRN*, ID: 424860.

Zou, H. and Xiao, J. Z. (2006), "The Financing Behaviour of Listed Chinese Firms", *British Accounting Review*, Vol. 38, No. 3, pp. 239-258.

Internet reference

Arab newspaper (www.arabnews.com).

Bakheet Investment Group (www.bakheetgroup.com)

Olayan company profile, (www.olayan.com).

Saudi Arabian Monetary Agency (www.sama.gov.sa).

Saudi Organization for Certified Public Accountants (SOCPA), (www.socpa.org.sa)

TADAWUL official web sit (www.tadawul.com.sa)

Washingtonpost spotlight, (www.Washingtonpost.com).

The Ministry of Commerce and Industry web site (www.commerce.gov.sa).

Appendices

Appendix 1

Table-1: **Summary of the studies included in the meta-analysis.**

Study	Studies' Source	Data source	Country	Period
Adedeji (1998)	*J B F A*	Table app. D: page 1148	UK	1993-96
Aivazian et al (2005)	*JCF*	Table 2: page 254	Canada	1982-99
Akhtar S. (2005)	*AJM*	Table 6, p332	Australia	1992-01
Akhtar S. and Oliver B. (2006)	*WP*	Table 2: page 27	Japan	1994-03
Allayannis et al. (2003)	*J F*	Table III: page 2685	8 East Asia countries	1996
Allen (1993)	*AFE*	Table 5: page 108	Australia	1954-66
Allen and Mizuno (1989)	*AE*	Table 3, p 576	Japan	1980-83
Allen, M. T. (1995)	*FR*	Table 4: page 421	USA	1980-89
Almazan A. and Molina C. (2005)	*JEMS*	Table III: page 276-77	USA	1998-00
Alves P. and Ferreira M. (2007)	*SSRN*	Table A-2: page 47	31 Countries	1995-00
Antoniou e*t* al. (2008)	*JFQA*	Table 6: page 79	FR, GR &UK	1989-00
Alti A. (2006)	J F	Table V: page 1697	USA	1971-02
Baker, M. and Wurgler J. (2002)	*J F*	Table III: page 16	USA	1968-99
Balakrishnan and Fox (1993)	*SMJ*	Table 2: page 11	USA	1978-87
Barakat and Rao 2004	*WP*	Table 7: page 44	12 Arabs countries	1996-01
Barclay M. et al. (2003)	*JCF*	Table 3: page 160	USA	1980-99
Barry P et al (2000)	*AJAE*	Table 2: page 927	USA	1990-94
Baskin (1989)	*FM*	Exhibit 2: page 30	USA	1960-72
Bennett and Donnelly (1993)	*BAR*	Tables 4,5 and 6: page 54,56,57	UK	1977-88
Berger et al (1997)	*J F*	Table IV: page 1428	USA	1984-91
Bevan and Danbolt (2004)	*AFE*	Table 2: page 60	UK	1991-97
Bhaduri (2002)	*AFE*	Table 5: page 663	India	1990-95
Billett et al. (2007)	J F	Table VII: page 719	USA	1989-02
Booth e*t* al. (2001)	*J F*	Table V, VI and VII: page 106-11	10 developing countries	1989-90
Boyle and Eckhold (1997)	*AFE*	Table 2: page 434	New Zealand	1986-89
Bradley et al (1984)	*J F*	Table IV: page 875	USA	1962-81
Brailsford et al (2002)	*AF*	Table 2: page 16	Australia	1989-95
Bulan L. and Sanyal P. (2006)	*WP*	Table 2, page 24	USA	1990-03
Burgman T. (1996)	*JIBS*	Table 6: page	USA	1987-91
Cassar and Holmes (2003)	*AF*	Table 3: page 137	Australia	1995-97
Chang and Rhee (1993)	*FM*	Exhibit 2: page 27	USA	1981-87

Chen and Hammes (2004)	*SSRN*	Table, 3 and 5: page 29, 31	6 European countries and US	1990-96
Chen and Zhao (2006)	*FRL*	Table 4 and 5: page 13 and 17	USA	1972-02
Chen et al. (1998)	*WP*	Table 7.4 and 4.5: page 26	Netherlands	1984-95
Chen J. (2004)	*JBR*	Table 4 and 5: page 1344,1345	China	1995-00
Chung K (1993)	*JBFA*	Table 4, P 93	USA	1980-84
Chun-Hung T. and Jang S. (2007)	*IJHM*	Table 3: page 182	USA	1997-03
Colombo E. (2001)	*AE*	Table 7: page 1699	Hungary	1992-96
Crutchley and Hansen (1989)	*FM*	Exhibit 6: page 45	USA	1977-85
Deesomsak et al (2004)	*JMFM*	Table 4: page 13	4 Asian countries	1993-01
De Jong A. (2002)	EFR	Table IV: page 50	Netherlands	1992–97
De Jong et al (2007)	*FBF*	Table 2, p 34-39	42 countries	1997-2001
DeMedeiros and Daher (2004)	*WP*	Table 1: page 8	Brazil	1995-02
DeMiguel and Pindado (2001)	*JCF*	Table 4: page 91	Spain	1990-97
Desai et al. (2004)	*J F*	Table II: page 2464	USA	1982-94
Dessí R. and Robertson D. (2003)	*EJ*	Table 3: page 914	UK	1976-89
Doukas and Pantzalis (2003)	*JCF*	Table 2: page 76	USA	1988-94
Downs T. (1993)	*FR*	Table 4: page 570	USA	1969-85
Drobetz and fix (2005)	SZVS	Table 7: page 101	Switzerland	1996–01
Du and Dai (2005)	*CGIR*	Table 1: page 65-66	9 East Asia countries	1994-96
Dzolkarnaini N (2006)	*MAR*	Table7: page 25-27	Malaysia	1995-02
Eriotis N. (2007)	*FM*	Table III: page 328	Greece	1997-01
Esperança et al. (2003)	*JSBED*	Table IV: page 70	Portugal	1992-96
Fama and French (2002)	*RFS*	Table 3: page 21	USA	1965-99
Fan et al. (2006)	*SSRN*	Table App. 3: page 49-50	39 developed and developing countries	1991-00
Fattouh et al. (2005)	*SSRN*	Table 3 and 5: page 25 and 27	UK	1988-98
Fischer et al (1989)	*J F*	Table IX: page 36	USA	1977-85
Flannery and Rangan (2006)	*JFE*	Table 11: page 501	USA	1965-01
Frank and Goyal (2003)	*JFE*	Table 7: page 240	USA	1971-93
Frank and Goyal (2004)	*SSRN*	Table 8: page 43	USA	1950-00
Fraser et al. (2006)	*JBF*	Table 4: page 1301	Malaysia	1990-99
Frieder and Martell (2006)	*SSRN*	Table 3: page 30	USA	1988-98
Friend and Lang (1988)	*J F*	Table II and III: page 277	USA	1979-83
Frydenberg S. (2003)	*SSRN*	Table III, IV, V: page 42-43	Norway	1990-00
Gatward and Sharpe (1996)	*AJM*	Table 1,p 101	Australia	1967-85
Gaud et al. (2005)	*EFM*	Table 3: page 61-62	Switzerland	1991-00

Gaud et al. (2007)	*IRFA*	Table 2 page	13 European country	
Giannetti (2003)	*JFQA*	Table 6: page 198	8 European countries	1997
Graham and Tucker (2005)	*SSRN*	Table 5: page 36	USA	1975 -00
Gul F. (1999)	*P-BFJ*	Table 6: page 169	China	1990-95
Hall *et* al. (2004)	*JBFA*	Tables 5 and 6: page 723-24	8 European countries	1995
Harvey et al (2004)	*JFE*	Table 2: page 12	18 emerging markets	1995-96
Heshmati (2001)	*WP*	Table 6: page 33	SWEDEN	1993-97
Hirota (1999)	*JJIE*	Table IV: page 217	Japan	1977-92
Hogfeldt and Oborenko (2005)	*SSRN*	Table 5: page 38	SWEDEN	1979-97
Homaifar et al (1994)	*J B F A*	Table 3: page 9	USA	1979-88
Hovakimian (2006)	*JFQA*	Table 1: page 225	USA	1983-02
Hovakimian et al (2001)	*JFQA*	Table 3: page 8	USA	1979-97
Huang and Song (2006)	*CER*	Table 7: page 32	China	1994-03
Hung et al. (2002)	*JPIF*	Table V: page 445	Hong Kong	1993-00
Hussain and Nivorozhkin (1997)	*SSRN*	Table 10: page 21	Poland	1991-94
Jensen et al (1992)	*JFQA*	Table 3A: page 256	USA	1982
Jiraporn and Gleason (2007)	*JFR*	Table 5: page 31	USA	1993-02
Jordan et al. (1998)	*J B F A*	Table 3: page 17	UK	1989-93
Kahle and Shastri (2005)	*JFQA*	Table 3: page 148-149	USA	1995-99
Kale and Shahrur (2007)	*SSRN*	Table 3: page appendix	USA	1984-03
Joeveer K. (2006)	*WP*	Appendix 6: page 19	9 Eastern European countries.	1995–02
Kayhan and Titman (2007)	*JFE*	Table B.1: page 30	USA	1971-02
Kester (1986)	*FM*	Table 5: page 13	Japan and US	1982-83
Kim, et al. (2006),	*AEJ*	Table 2: page 299	South Korea	1985-02
Klapper et al. (2006)	*SSRN*	Table 9, p 41	Poland	1998-02
Kyereboah and Biekpe (2006)	*SFJE*	Table 2: page 678	Nairobi	1996-98
Lasfer (1995)	*EFM*	Table 4: page 277	UK	1972-83
Lee, et al. (2000)	*AEJ*	Table 2, 4: page 348, 352	South Korea	1981-97
Lemmon et al. (2006)	*SSRN*	Table 4 appendix	USA	1965-03
Lord and McIntyre (2003)	*IRFA*	Table 3, page 299	USA	1974-87
Lowe et al (1994)	*MDE*	Table 2: page 252	Australia	1984-88
Macic-Mason J. (1990)	*J F*	Table II, p 1484-85	USA	1977-87
MacKay and Phillips (2005)	*RFS*	Table 5: page 1456	USA	1981-00
Manos et al (2001)	*WP*	Table 5:panel b: page 38	India	2000
Mehran et al (1999)	*FM*	Table 3: page 13	USA	1986-91
Mehrotra et al (2005)	*JACF*	Table 4: page 24	USA	1979-97
Mitton T. (2006)	*SSRN*	Table 7: page appendix	34 emerging markets	1980-04
Moh'd et al. (1998)	*FR*	Table 2: page 98	USA	1972-89

Molina C. (2005)	*J F*	Table III: page 1440	USA	1988-02
Mueller E. (2005)	*SSRN*	Table, 4: page 21	UK	1997-01
Mutenheri and Green (2002)	*WP*	Table 4: page 19	Zimbabwe	1986-99
Nam et al (2003)	*FR*	Table 3: page 88	USA	1996
Nguyen and Ramachandran (2006)	*AEB*	Table 7: page 205	Vietnam	1998-01
Nishioka and Baba (2004)	*WP*	Table 2-1,2-2: page 20-21	Japan	1992-03
Nivorozhkin E. (2002)	*DE*	Tables, VIII: page 181-82	Hungary	1992–95
Omet and Mashharawe (2001)	*WP*	Tables 4 and 8: page 21, 23	4 Arab countries	1996-01
Ooi J. (1999)	*JPIF*	Table IV: page 475	UK	1989-96
Ozkan (2001)	*J B F A*	Table 2: page 187	UK	1984-96
Petersen and Rajan (1994)	*J F*	Table V: page 19	US	1988-89
Rajan and Zingales (1995)	*J F*	Table IX: page 1453	7 developed countries	1984-91
Ramalho and Da Silva (2007)	*SSRN*	Table 4: page 30	Portugal	1999
Sapar N. and Lukose P. (2002)	*SSRN*	Table VIII: page appendix	India	1990-92
Shenoy and Koch (1996)	*JEF*	Table 5: page 324	USA	1979-89
Short et al. (2002)	*IJEB*	Table 2: page 391	UK	1988-92
Shuetrim et al. (1993)	*WP*	Table 3: page 24	Australia	1974-90
Shyam-Sunder and Myers (1999)	*JFE*	Table 5: page 241	USA	1971-89
Sogorb-Mira and Gracia (2003)	*SSRN*	Table 13: page 28	Spain	1994-98
Sogorb-Mira F. (2001)	*SSRN*	Table 4: page 27	Spain	1994-98
Song H. (2005)	WP	Table 8: page 21	SWEDEN	1992-00
Theis and Casey (1999)	*JPIF*	Table I: page 31	UK	1996
Thies and Klock (1992)	*RFE*	Table 2: page 12	USA	1935-83
Titman and Wessels (1988)	*J F*	Table IV: page 13	USA	1974-82
Tong and Green (2005)	*AE*	Table, 4: page 2187	China	2001–03
Twite G. (2001)	*IRF*	Table 4: page 233	Australia	1983-97
Voulgaris et al (2004)	*IRAE*	Table 4: page 254	Greece	1989-96
Wald (1999)	*JFR*	Tables 4, 2a: page 174, 185	5 developed countries	1991-92
Wanzenried G. (2002)	*WP*	Table 7.2.1: page 23	10 European countries	1988-98
Wen et al (2002)	*CGIR*	Table 2: page 79	China	1996-98
Wi and Sorensen (1986)	*JFQA*	Table 3: page 139	USA	1970-80
Wiwattanakantang 1999	*P-BFJ*	Table 12 and 13: page 397-98	Thailand	1996
Yan An (2006)	*JFQA*	Tables 5, 6: page 723-24	USA	1983-97
Yu H. (2003)	*SSRN*	Table 7: page 34	Taiwan	1991-00
Zou and Xiao (2006)	*BAR*	Table 4: page	China	1993–00

AE: Applied Economics
AEB: ASEAN Economic Bulletin
AEJ: Asian Economic Journal
AF: Accounting and finance
AFE: Applied Financial Economics
AJAE: American Journal of Agricultural Economics
AJM: Australian Journal of Management
BAR: British Accounting Review
CER: China Economic Review
CGIR: Corporate Governance: An International Review
DE: Developing Economies
EFM: European Financial Management
EFR: European Finance Review
EJ: Economic Journal
FM: Financial Management
FR: Financial Review
FRL: Finance Research Letters
IJEB: Int. J. of the *Economics* of *Business*
IJHM: International Journal of Hospitality Management
IRAE: International Review of Applied Economics
IRF: International Review of Finance
IRFA: International Review of Financial Analysis
JACF: Journal of Applied Corporate Finance
JBF: Journal of Banking & Finance
JBFA: Journal of Business Finance and Accounting
JBR: Journal of Business Research
JCF: Journal of Corporate Finance
JEF: Journal of Empirical Finance
JEMS: Journal of Economics & Management Strategy
JF: Journal of Finance
JFE: Journal of Financial Economics
JFQA: Journal of Financial and Quantitative Analysis
JFR: Journal of Financial Research
JIBS: Journal of International Business Studies
JJIE: Journal of the Japanese and International Economies
JMFM: Journal of Multinational Financial Management
JPIF: Journal of Property Investment & Finance
JSBED: Journal of Small Business and Enterprise Development
MAR: Malaysian Accounting Review
MDE: Managerial and Decision Economics
P-BFJ: Pacific-Basin Finance Journal
RFE: Review of Financial Economics
RFS: Review of Financial Studies
SFJE: South African Journal of Economics
SMJ: Strategic management journal
SSRN: Social Science Research Network
SZVS: Schweizerische Zeitschrift for Volkswirtschaft und Statistik
WP: Working paper

Appendix 2

Table-2: **Top 100 Saudi Companies in 2003**

Company	Revenue Rank in 2003	Revenue in 2002 (SR in million)	Assets 2002 (SR in million)	Sector	Listed in SSM
Kingdom Holding Company	1	35,600	92,300	Diversified	Y
Saudi Basic Industries Corp.	2	34,026	99,172	Petrochemical	Y
Saudi Telecom Company	3	23,547	40,913	Telecom.	Y
Dallah Al-Baraka Group	4	17,374	47,974	Diversified	N
Saudi Aramco Mobil Refinery Co. Ltd	5	11,014	5,493	Petrochemicals	N
Consolidated Contractors Int'l Co. S.A.L	6	5,578	4,217	Contracting	N
Olayan group Holding Company	7	4,133	8,577	Diversified	N
Riyad Bank	8	3,673	67,209	Banking	Y
Savola Group	9	3,624	3,472	Agribusiness	Y
Saad Group	10	3,452	4,012	Diversified	N
Al Rajhi Banking & Investment Corp.	11	3,379	59,113	Banking	Y
Samba Financial group	12	3,143	76,362	Banking	Y
Al Faisaliah Group Co. (Ltd.)	13	2,500	1,645	Diversified	N
Alsuwaiket Trading & Contracting Co.	14	2,113	994	Contracting	N
S.A. Al Rajhi Co.	15	1,979	4,548	Agribusiness	N
The Saudi British Bank	16	1,841	46227	Banking	Y
Arab National Bank	17	1,718	44,299	Banking	Y
Banque Saudi Fransi	18	1,699	44,713	Banking	Y
Marei Bin Mahfouz Group of Co. Ltd.	19	1,670	1,695	Industrial	N
Riyadh Cables Group of Companies	20	1,536	1,590	Industrial	N
Saudi Hollandi Bank	21	1,523	26,899	Banking	Y
Al Duais Group	22	1,500	0	Hospitality	N
Zamil Industrial Investment Co. (ZIIC)	23	1,406	1,262	Industrial	Y
Al Tayyar Travel Group Ltd.	24	1,404	357	Services	N
El Seif Group of Companies	25	1,359	0	Diversified	N
National Gas & Ind. Co.	26	1,255	925	Industrial	Y
Arab Supply & Trading Corp.	27	1,216	1,732	Agribusiness	N
The National Shipping Co. of Saudi Arabia	28	1,210	4,398	Shipping	Y
Saudi Arabian Amiantit Co.	28	1,210	2,440	Industrial	Y
National Co. Cooperative Insurance	30	1,181	1,699	Insurance	Y
Haji Husein Alireza & Co. Ltd.	31	1,132	0	Trading	N
Isam Kabbani Group of Companies	32	1,128	871	Industrial	N
Alhamrani Group of Companies	33	956	1,024	Trading	N
Samama Group of Companies	34	900	559	Diversified	N
Southern Province Cement Co.	35	888	2,086	Industrial	Y
Gulf United Investment	36	825	500	Investment	N
Saudi Dairy Foodstuff Co.	37	795	827	Agribusiness	Y
Saleh & Abdulaziz Abahsain Co. Ltd.	38	785	722	Diversified	N
Al Obeikan Group for Ind. Invest. Co. Ltd.	39	753	963	Publishing	N
Yanbu Cement Co.	40	746	2,060	Industrial	Y
Saudi Cable Company	41	730	1,124	Industrial	Y
Arabic Computer Systems Ltd.	42	721	111	IT	N
Fursan Travel & Tourism	43	704	12	Services	N
Alsalam Aircraft Co. Ltd	44	652	645	Aeronautics	N
Al Tuwairqi Group of Companies	45	645	573	Industrial	N
Yamama Saudi Cement Co. Ltd.	46	625	1,372	Industrial	Y
The Saudi Investment Bank	47	608	19,957	Banking	Y
M. & A. Al Subeaei for Exchange & Trading	48	600	1,980	Finance	N

Table-2: **Top 100 Saudi Companies in 2003**

Company	Revenue Rank in 2003	Revenue in 2002 (SR in million)	Assets 2002 (SR in million)	Sector	Listed in SSM
Mohammed Al Mojil Group	48	600	1,500	Construction	N
AAl Taher Group	50	599	0	Diversified	N
Advanced Electronics Company	51	592	486	Electronics	N
Al Aujan Industries Co.	52	590	489	Industrial	N
Zahran Maintenance Co.	53	584	21	Engineering	N
Abdul Ghani El Ajou & Sons Holding	54	580	0	Diversified	N
Al Babtain Group	55	560	681	Industrial	N
Jarir Marketing Co.	56	541	559	Trading	Y
Arabian Agricultural Services Co.	57	521	923	Agribusiness	N
Jeddah Cable Company	58	515	140	Industrial	N
Arabian Cement Co. Ltd.	59	514	1,368	Industrial	Y
Al Alamiah Electronic Co.	60	514	502	IT	N
Aluminium Products Co. Ltd.	61	505	530	Industrial	N
Mohammed Assad Aldrees & Sons Co.	62	502	532	Petrochemical	N
The National Titanium Dioxide Co. Ltd.	63	465	1,092	Industrial	N
National Agricultural Development Co.	64	459	1,050	Agribusiness	Y
Trading & Industrial Group Holding Ltd.	65	450	500	Finance	N
Saudi Arabian Lubricating Oil Co.	66	418	402	Petrochemicals	N
Al Abdulkarim Trading Co.	67	380	0	Trading	N
Saudi Pharma. Ind. & Medical Appl. Co.	68	362	203	Medical	Y
ABB Contracting Company Ltd.	69	354	108	Contracting	N
Abdullah A.M Al Khodari Sons Co.	70	350	325	Contracting	N
ABB Electrical Industries Co. Ltd.	71	331	241	Industrial	N
Consolidated Contractors Co. WLL	72	326	327	Contracting	N
Arabian Drilling Company	73	318	460	Petrochemicals	N
Arabian Gulf Manuf. Ltd For Plastic Ind.	74	310	371	Industrial	N
Al Majal Services Co.	75	310	107	Services	N
Mekkah Construction & Development Co.	76	307	2,545	Contracting	Y
Arabian Geophysical & Surveying Co. Ltd.	77	305	406	Petrochemicals	N
Aswad Group	77	305	210	Contracting	N
Saudi Guardian Int'l. Float Glass Co. Ltd.	79	285	465	Industrial	N
Tihama for Adv., PR & Marketing	80	272	316	Advertising	Y
National Industrialization Co.	81	250	2,227	Industrial	Y
Elaf Group of Companies	82	247	68	Hospitality	N
Saudi Ceramic Co.	83	225	563	Industrial	Y
Samir Photographic Supplies	84	220	177	Electronics	N
Saudi Arabian Fertilizer Co.	85	212	4,320	Industrial	Y
International Computer Company Ltd.	86	200	3	IT	N
Al Jazira Bank	87	198	6	Banking	Y
Saudi Hotels & Resorts Co.	88	167	1,383	Hospitality	Y
Projects & Trading Co.	89	149	202	Construction	N
Arabian Pipes Co.	90	145	288	Industrial	Y
Hail Agricultural Development Co.	91	136	371	Agribusiness	Y
Saudi Fisheries Company	92	135	244	Agribusiness	Y
Mindshare S.A.	93	135	0	Advertising	N
Heating & Air conditioning Ent. Ltd	94	100	71	Industrial	N
L'Azurde Group for Industrial Investment	94	100	0	Jewelery	N
Taiba Inv. & Real Estate Dev. Co	96	90	1,272	Investment	Y

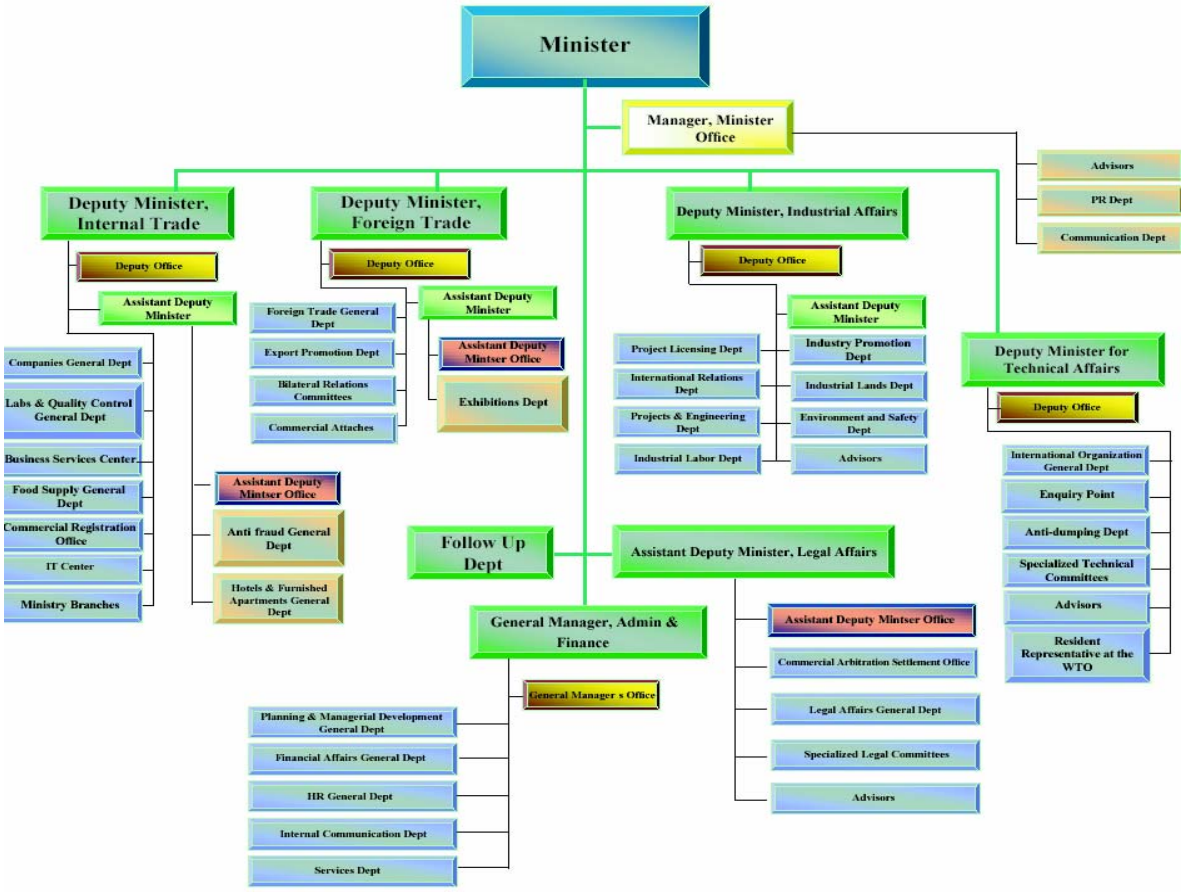
Table-2: **Top 100 Saudi Companies in 2003**

Company	Revenue Rank in 2003	Revenue in 2002 (SR in million)	Assets 2002 (SR in million)	Sector	Listed in SSM
Modern Arab Construction Co. Ltd	97	69	55	Contracting	N
Nardeen Lighting Co. Ltd.	98	66	44	Lighting	N
International System Engineering Co. Ltd	99	26	0	IT	N
Aljardan International Agencies	100	17	3	Technology	N

Source: www.arabnews.com

Appendix 3

Figure -1: **The organizational chart of the Companies General Department**



Source: The Ministry of Commerce and Industry web site (www.commerce.gov.sa)

Table-3: **The Initial list of Saudi listed companies as of at 31 January 2006**

No.	Symbol	Long Name	Short Name	Acronym
1	2010	Saudi Basic Industries Corp	SABIC	SABIC
2	2310	Saudi Internati. Petroche Co	Sipchem	SIPCHEM
3	4180	Ahmed H. Fitaihi Company	AHF	AHFCO
4	4061	Al Mawashi Al Mukairish United Co.	MMUCO	MMUCO
5	1120	Al Rajhi Bank	Al Rajhi	RJHI
6	2140	Al-Ahsa Development Co.	ADC	AADC
7	4130	Al-Baha Investment & Development co	Al-baha	ABDICO
8	6070	Al-Jouf Agriculture Development Co.	ALJOUF	JADCO
9	4200	Aldrees Petroleum & Transport Services Co.	Aldrees	Aldrees
10	2280	Almarai Company	Almarai	ALMARAI
11	2170	Alujain Corporation	Alujain	ALCO
12	1080	Arab National Bank	ARNB	ARNB
13	3010	Arabian Cement Co.LTd	ACC	ARCCO
14	2200	Arabian Pipes Company	APC	APCO
15	4150	Arriyadh Development Co.	ARDCO	ADCO
16	4080	Aseer Trading, Tourism & Manufacturing Co.	Aseer	ATTMCO
17	6060	Ashargiyah Agriculture Development Co.	ASH SHARQIYAH	ASACO
18	1140	BANK ALBILAD	ALBILAD	ALBI
19	1020	Bank AlJazira	BJAZ	BJAZ
20	1050	Banque Saudi Fransi	BSFR	BSFR
21	6080	Bishah Agriculture Development Co.	BISHACO	BISACO
22	3080	Eastern Province Cement Co.	E.P.C.C.O	EACCO
23	2300	Saudi Paper Manufacturing Co.	SPM	SPM
24	2180	Filing & Packing Materials Manufacturing Co.	FIPCO	FIPCO
25	2100	Food Products Co.	githaiah	FPCO
26	6030	Hail Agriculture Development Co.	HADCO	HAACO
27	4190	Jarir Marketing Co	Jarir	Jarir
28	6090	Jazan Development Co.	JAZADCO	GIZACO
29	4100	Makkah Construction & Development Co.	MCDC	MCDCO
30	2210	Nama Chemicals Co.	Nama Chemicals	NAMA
31	6010	National Agriculture Development Co.	NADEC	NADEC
32	4160	National Agriculture Marketing Co.	THIMAR	THIMAR
33	2080	National Gas & Industrialization Co.	GASCO	NGIC
34	2090	National Gypsum Company	NGC	NGCO
35	2060	National Industrialization Co	NIC	NIC
36	2220	National Metal Manufacturing and Casting Co.	Maadaniyah	NMMCC
37	6020	Qassim Agriculture Co.	GACO	QAACO
38	1010	Riyad Bank	RIBL	RIBL

39	2260	Sahara Petrochemical Co.	Petrochemical	SPC
40	1090	Samba Financial Group	Samba	Samba
41	2120	Saudi Advanced Industries Co.	SAIC	SAICO
42	2020	Saudi Arabia Fertilizers Co.	SAFCO	SAFCO
43	2030	Saudi Arabia Refineries Co.	SARCO	SARCO
44	2160	Saudi Arabian Amiantit Co.	Amiantit	SAAC
45	4050	Saudi Automotive Services Co.	SASCO	SACO
46	2110	Saudi Cable Company	SCC	SCACO
47	3030	Saudi Cement Company.	SCC	SACCO
48	2040	Saudi Ceramic Co.	Saudi Ceramics	SCERCO
49	2230	Saudi Chemical Company	SCC	SCCO
50	5110	Saudi Electricity Company	Saudi Electric.	SECO
51	6050	Saudi Fisheries Co.	SFICO	SFICO
52	1040	Saudi Hollandi Bank	SHB	AAAL
53	4010	Saudi Hotels s Co.	SHAR.ACO	SHARCO
54	2130	Saudi Industrial Development Co.	SIDC	SIDC
55	4140	Saudi Industrial Export Co	SIECO	SIECO
56	2250	Saudi Industrial Investment Group	SIIG	SIIG
57	2190	Saudi Industrial Services Co.	SISCO	SISCO
58	4110	Saudi Land Transport Co.	mubarrad	SLTCO
59	2070	Saudi Pharmaceutical Indust.& Med. Appliances Corp.	SPIMACO	SPIMACO
60	4040	Saudi Public Transport Co.	SAPTCO	SAPTCO
61	4020	Saudi Real Estate Co.	SRECO	SRECO
62	7010	Saudi Telecom	STC	STC
63	2270	Saudia Dairy & Foodstuff .Co	SADAFCO	SADAFCO
64	2050	SAVOLA Group	Savola Group	SAVOLA
65	3050	Southern Province Cement Co.	spcc	SOCCO
66	6040	Tabuk Agriculture Co.	TADCO	TAACO
67	3090	Tabuk Cement Co.	TCC	TACCO
68	4090	Taibah Investment & Real Estate Co.	Taiba	TIRECO
69	8010	The Company for Cooperative Insurance	NCCI	NCCI
70	2150	The National Co. for Glass Industries	Zoujaj	Zoujaj
71	4030	The National Shipping Co. of Saudi Arabia	NSCSA	NSCSA
72	3040	The Qassim Cement Co	QACCO	QACCO
73	1060	The Saudi British Bank	SABB	SABB
74	1030	The Saudi Investment Bank	saib	SIBC
75	4070	Tihama Advertising s Co.	TAPRCO	TAPRCO
76	4170	Tourism Enterprise Co.	TECO	TECO
77	3020	Yamamah Saudi Cement Co. Ltd.	YSCC	YACCO
78	3060	Yanbu Cement Co.	YCC	YNCCO
79	2290	Yanbu Petrochemical Company	YANSAB	YANSAB
80	2240	Zamil Industrial Investment Co	Zamil Indust	ZIIC

Source: TADAWUL web site (www.tadawul.com.sa)

Appendix 4

Table-4: **Pure cross-sectional regression (Short-term debt)**

STD	Listed (n = 60)					Unlisted (n = 403)				
	2000	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
LOGASSETS	0.025	0.039**	0.011	0.009	0.025	0.062***	0.062***	0.068***	0.053***	0.051***
	(0.115)	(0.039)	(0.577)	(0.713)	(0.115)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.076	0.374***	0.233*	0.054	0.293***	-0.029	-0.011	-0.017	-0.094*	-0.083*
	(0.502)	(0.003)	(0.092)	(0.753)	(0.008)	(0.509)	(0.843)	(0.741)	(0.066)	(0.093)
TANG1	-0.040	0.047	-0.021	-0.016	0.010	-0.130***	-0.109***	-0.086**	-0.112***	-0.139***
	(0.359)	(0.182)	(0.619)	(0.700)	(0.740)	(0.001)	(0.009)	(0.042)	(0.003)	(0.000)
FCF	-0.123	-0.199	-0.424**	-0.235	-0.252**	-0.043	-0.165***	-0.109**	-0.156***	-0.176***
	(0.405)	(0.177)	(0.020)	(0.168)	(0.025)	(0.290)	(0.000)	(0.017)	(0.004)	(0.000)
QR	-0.024***	-0.001	-0.014**	0.007	-0.010***	-0.033***	-0.032***	-0.031***	-0.030***	-0.030***
	(0.001)	(0.899)	(0.016)	(0.714)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
UNIQ	0.119	-0.066	-0.024	-0.070	-0.077	-0.077	0.025	0.013	0.002	0.092
	(0.248)	(0.551)	(0.887)	(0.586)	(0.420)	(0.371)	(0.821)	(0.881)	(0.989)	(0.469)
M/B & G. ASSETS	0.034*	-0.006	0.005	0.016	-0.012*		-0.029	-0.065**	-0.077**	-0.030
	(0.053)	(0.669)	(0.805)	(0.332)	(0.062)		(0.263)	(0.023)	(0.011)	(0.313)
DIV	0.000	-0.025**	-0.018	0.003	-0.037*	-0.001	-0.002	-0.001	-0.007	0.002
	(0.994)	(0.038)	(0.129)	(0.913)	(0.082)	(0.913)	(0.866)	(0.837)	(0.294)	(0.766)
LOGAGE	-0.086*	-0.041	-0.046	-0.060	-0.036	0.062**	0.077**	0.064*	0.105**	0.079
	(0.071)	(0.340)	(0.284)	(0.295)	(0.345)	(0.039)	(0.041)	(0.096)	(0.026)	(0.156)
RISK					0.000					0.0001*
					(0.976)					(0.047)
Gov.	-0.084**	-0.143***	-0.062	-0.064	-0.080**					
	(0.043)	(0.002)	(0.158)	(0.255)	(0.031)					
MINDUM	0.021	0.045**	0.055**	0.063**	0.019	0.021	0.011	-0.008	0.002	-0.002
	(0.382)	(0.030)	(0.041)	(0.031)	(0.194)	(0.253)	(0.561)	(0.658)	(0.918)	(0.936)
CEMDUM	0.002	-0.007	0.064	-0.006	0.054**					
	(0.933)	(0.779)	(0.144)	(0.914)	(0.040)					
FARMDUM	-0.010	-0.027	0.011	0.018	-0.006	-0.049	-0.030	-0.026	-0.017	-0.021
	(0.729)	(0.239)	(0.682)	(0.449)	(0.782)	(0.103)	(0.560)	(0.581)	(0.768)	(0.754)
INTERCEPT	-0.047	-0.260	0.021	0.013	-0.096	-0.311***	-0.336***	-0.369***	-0.273**	-0.226**
	(0.757)	(0.137)	(0.912)	(0.954)	(0.531)	(0.001)	(0.001)	(0.001)	(0.014)	(0.031)
Wald χ^2 -test	38.19***	47.65***	29.29***	21.61*	36.09***	120.83***	133.22***	124.37***	128.25***	152.40***
Adjusted R^2	0.2172	0.2375	0.1710	0.0579	0.2111	0.1770	0.1884	0.1654	0.1760	0.1797

Table-5: **Pure cross-sectional regression (Long-term debt)**

LTD	Listed (n = 60)					Unlisted (n = 403)				
	2000	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
LOGASSETS	0.015	0.036	0.027	0.035	0.047**	0.023***	0.016***	0.016***	0.022***	0.018***
	(0.545)	(0.129)	(0.271)	(0.213)	(0.020)	(0.000)	(0.006)	(0.004)	(0.000)	(0.001)
ROA	-0.217	-0.073	-0.379***	-0.293**	-0.055	-0.035**	-0.046***	-0.049***	-0.037**	-0.028*
	(0.121)	(0.653)	(0.004)	(0.020)	(0.648)	(0.037)	(0.006)	(0.000)	(0.026)	(0.057)
TANG	0.096	0.107**	0.090*	0.115**	0.112**	0.103***	0.099***	0.090***	0.088***	0.076***
	(0.125)	(0.044)	(0.062)	(0.046)	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FCF	0.076	-0.356*	-0.190	-0.057	0.085	-0.015	-0.002	-0.020*	-0.019	-0.001
	(0.697)	(0.067)	(0.112)	(0.726)	(0.440)	(0.181)	(0.802)	(0.076)	(0.134)	(0.903)
QR	0.003	0.012	-0.010	-0.008	-0.002	0.001	0.000	0.003	0.003	0.002
	(0.808)	(0.296)	(0.283)	(0.253)	(0.702)	(0.682)	(0.861)	(0.106)	(0.102)	(0.316)
UNIQ	0.100	-0.170	-0.087	-0.028	-0.109	0.064	0.040	0.047	0.037	0.058
	(0.449)	(0.224)	(0.525)	(0.852)	(0.371)	(0.116)	(0.228)	(0.154)	(0.399)	(0.164)
M/B& GASSETS	-0.004	-0.006	0.021	-0.024*	-0.017*		-0.010*	-0.012	-0.003	-0.012
	(0.862)	(0.825)	(0.284)	(0.087)	(0.063)		(0.097)	(0.105)	(0.743)	(0.112)
DIV	-0.036***	-0.038**	0.013	-0.022	-0.090***	-0.005**	-0.001	0.001	0.000	-0.003
	(0.006)	(0.016)	(0.497)	(0.397)	(0.007)	(0.044)	(0.647)	(0.809)	(0.957)	(0.129)
LOGAGE	0.005	-0.023	-0.061	-0.079*	0.010	-0.012	-0.022*	-0.018	-0.016	-0.023
	(0.892)	(0.641)	(0.189)	(0.095)	(0.804)	(0.273)	(0.062)	(0.152)	(0.197)	(0.101)
RISK					0.004					0.0001
					(0.127)					(0.568)
Gov.	-0.068	-0.048	0.017	0.010	-0.028					
	(0.200)	(0.429)	(0.780)	(0.871)	(0.607)					
MINDUM	0.036	0.079**	0.092***	0.075**	0.044*	0.022**	0.019**	0.015**	0.009	0.012*
	(0.365)	(0.015)	(0.004)	(0.016)	(0.055)	(0.011)	(0.013)	(0.048)	(0.204)	(0.073)
CEMDUM	0.023	0.046	0.053	0.095**	0.023					
	(0.723)	(0.417)	(0.373)	(0.043)	(0.464)					
FARMDUM	-0.056	-0.035	0.008	-0.033	-0.032	-0.010	-0.002	-0.005	0.004	0.007
	(0.118)	(0.280)	(0.821)	(0.336)	(0.278)	(0.395)	(0.906)	(0.719)	(0.794)	(0.636)
INTERCEPT	-0.098	-0.259	-0.156	-0.150	-0.364**	-0.151***	-0.086*	-0.096**	-0.141***	-0.104**
	(0.678)	(0.231)	(0.485)	(0.548)	(0.037)	(0.000)	(0.052)	(0.026)	(0.002)	(0.016)
Wald χ^2 -test	28.45***	32.05***	31.65***	29.35***	27.85**	115.26***	87.49***	78.80***	70.80***	53.13***
Adjusted R^2	0.0535	0.1992	0.1548	0.1331	0.2025	0.3009	0.2618	0.2467	0.2203	0.1833

Table-6: **Pure cross-sectional regression (Total debt)**

TD	Listed (n = 60)					Unlisted (n = 403)				
	2000	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
LOGASSETS	0.038	0.077**	0.039	0.044	0.072***	0.099***	0.093***	0.099***	0.087***	0.078***
	(0.244)	(0.013)	(0.260)	(0.225)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.150	0.309	-0.148	-0.220	0.237	-0.102**	-0.092	-0.096*	-0.165***	-0.131**
	(0.462)	(0.164)	(0.458)	(0.273)	(0.144)	(0.050)	(0.128)	(0.076)	(0.006)	(0.021)
TANG1	0.059	0.156**	0.071	0.087	0.123**	0.055	0.058	0.052	0.025	-0.018
	(0.511)	(0.036)	(0.361)	(0.308)	(0.047)	(0.260)	(0.246)	(0.295)	(0.621)	(0.725)
FCF	-0.047	-0.576**	-0.611***	-0.392*	-0.168	-0.082*	-0.164***	-0.140***	-0.173***	-0.181***
	(0.880)	(0.017)	(0.006)	(0.077)	(0.348)	(0.068)	(0.000)	(0.004)	(0.001)	(0.000)
QR	-0.022	0.011	-0.024**	-0.006	-0.013*	-0.032***	-0.031***	-0.026***	-0.024***	-0.025***
	(0.151)	(0.485)	(0.045)	(0.764)	(0.056)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
UNIQ	0.222	-0.242	-0.108	-0.159	-0.185	0.067	0.071	0.060	0.063	0.171
	(0.254)	(0.198)	(0.635)	(0.434)	(0.276)	(0.559)	(0.573)	(0.552)	(0.622)	(0.248)
M/B	0.031	-0.011	0.027	-0.007	-0.029**		-0.046*	-0.097***	-0.086***	-0.055*
	(0.358)	(0.700)	(0.390)	(0.749)	(0.021)		(0.084)	(0.002)	(0.009)	(0.095)
DIV	-0.036*	-0.065***	-0.005	-0.023	-0.127***	-0.009	-0.003	0.001	-0.010	-0.004
	(0.082)	(0.002)	(0.832)	(0.621)	(0.003)	(0.346)	(0.783)	(0.904)	(0.158)	(0.662)
LOGAGE	-0.082	-0.062	-0.105	-0.148**	-0.026	0.049	0.038	0.037	0.091*	0.067
	(0.223)	(0.386)	(0.135)	(0.050)	(0.685)	(0.160)	(0.362)	(0.399)	(0.078)	(0.274)
RISK					0.004					0.0001
					(0.251)					(0.107)
Gov.	-0.151**	-0.193**	-0.045	-0.051	-0.107					
	(0.043)	(0.011)	(0.565)	(0.527)	(0.113)					
MINDUM	0.058	0.122***	0.146***	0.145***	0.063**	0.041*	0.031	0.005	0.007	0.006
	(0.239)	(0.002)	(0.002)	(0.002)	(0.025)	(0.082)	(0.160)	(0.827)	(0.766)	(0.791)
CEMDUM	0.026	0.035	0.113	0.111	0.076**					
	(0.723)	(0.556)	(0.178)	(0.165)	(0.048)					
FARMDUM	-0.066	-0.064	0.017	-0.009	-0.038	-0.093**	-0.056	-0.051	-0.034	-0.028
	(0.195)	(0.119)	(0.710)	(0.833)	(0.373)	(0.011)	(0.322)	(0.321)	(0.585)	(0.681)
INTERCEPT	-0.133	-0.535*	-0.146	-0.118	-0.460**	-0.565***	-0.512***	-0.559***	-0.501***	-0.418***
	(0.678)	(0.067)	(0.648)	(0.740)	(0.045)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)
Wald χ^2 -test	33.68***	66.58***	39.97***	36.76***	44.87***	168.27***	175.13***	163.75***	165.85***	165.16***
Adjusted R^2	0.0829	0.3255	0.1839	0.1961	0.3411	0.2586	0.2432	0.2194	0.2147	0.1820

Appendix 5: Note: shaded cells represent the changes observed in the relationship when alternative proxy entered to the basic model while italic bold cells represent the alternative proxy position in the model.

Table-7: **Alternative proxies (short-term debt) Listed sample**

Listed STD	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	Growth (Assets)	DIV-DUM	Age
SIZE	-0.047	0.***029******	-0.048	-0.046	-0.047	-0.047	-0.049	-0.080	-0.048	-0.053
	(0.469)	(0.009)	(0.451)	(0.470)	(0.465)	(0.472)	(0.468)	(0.326)	(0.452)	(0.391)
ROA	-0.006	-0.044	***0.006***	-0.006	-0.009	-0.010	-0.002	-0.010	-0.008	0.005
	(0.939)	(0.571)	***(0.406)***	(0.937)	(0.910)	(0.899)	(0.982)	(0.893)	(0.912)	(0.947)
TANG	0.004	0.004	0.005	***0.010***	0.001	-0.003	0.001	0.026	-0.001	0.015
	(0.935)	(0.924)	(0.918)	***(0.811)***	(0.980)	(0.956)	(0.984)	(0.597)	(0.983)	(0.748)
FCF	-0.130***	-0.111***	-0.133***	-0.130***	-0.131***	-0.129***	-0.129***	-0.111***	-0.129***	-0.133***
	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.001)	(0.003)	(0.002)
QR	-0.007*	-0.006	-0.007*	-0.006	***-0.005****	-0.007*	-0.006*	-0.007**	-0.007*	-0.006*
	(0.079)	(0.201)	(0.071)	(0.103)	***(0.096)***	(0.073)	(0.100)	(0.029)	(0.052)	(0.075)
UNIQ	-0.016	-0.009	-0.008	-0.020	-0.003	***0.013***	-0.009	-0.002	-0.015	-0.016
	(0.844)	(0.915)	(0.920)	(0.805)	(0.968)	***(0.181)***	(0.907)	(0.979)	(0.861)	(0.836)
M/B	0.003	0.001	0.003	0.003	0.003	0.003	***0.007***	***0.065***	0.004	-0.002
	(0.449)	(0.763)	(0.432)	(0.448)	(0.406)	(0.435)	***(0.500)***	***(0.183)***	(0.364)	(0.622)
DIV	-0.001	0.0003	-0.001	-0.001	-0.000	-0.001	-0.001	-0.000	***-0.008***	-0.001
	(0.818)	(0.929)	(0.846)	(0.812)	(0.944)	(0.846)	(0.879)	(0.947)	***(0.337)***	(0.913)
LOGAGE	-0.126	-0.180**	-0.123	-0.125	-0.125	-0.137	-0.103	-0.113	-0.123	***0.000***
	(0.185)	(0.017)	(0.205)	(0.187)	(0.187)	(0.156)	(0.244)	(0.169)	(0.202)	***(0.979)***
INTERCEPT	0.636	0.054	0.641	0.628	0.644	0.643	0.628	0.906	0.655	0.534
	(0.216)	(0.658)	(0.201)	(0.216)	(0.212)	(0.213)	(0.233)	(0.170)	(0.203)	(0.308)
F -test	3.98***	**4.58*** **	4.00***	3.97***	3.94***	4.02***	3.92***	4.26***	4.01***	3.67***
R^2 within	0.1448	**0.1443**	0.1497	0.1487	0.1522	0.1513	0.1490	0.1717	0.1525	0.1329
R^2 between	0.0313	**0.1323**	0.0302	0.0333	0.0285	0.0451	0.0277	0.0132	0.0321	0.0030
R^2 overall	0.0389	**0.1302**	0.0380	0.0410	0.0363	0.0520	0.0359	0.0196	0.0395	0.0091
Corr (ui, x)	-0.4221	**-0.2637**	-0.4213	-0.4133	-0.4353	-0.4190	-0.4064	-0.5808	-0.4438	-0.3878
N	300	**300**	300	300	300	300	300	300	300	300

Table-8: **Alternative proxies (long-term debt) Listed sample**

Listed LTD	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	Growth (Assets)	DIV-DUM	Age
SIZE	0.050*	***0.025***	0.061**	0.049*	0.051*	0.054**	0.034	0.037	0.051*	0.052*
	(0.058)	***(0.149)***	(0.031)	(0.059)	(0.053)	(0.040)	(0.151)	(0.240)	(0.055)	(0.052)
ROA	-0.189**	-0.242***	-0.028**	-0.187**	-0.191**	-0.217***	-0.271***	-0.237***	-0.187**	-0.193**
	(0.013)	*(0.005)*	(0.018)	(0.013)	(0.014)	(0.003)	(0.000)	(0.001)	(0.014)	(0.012)
TANG	0.104**	0.088*	0.096**	0.094**	0.110**	0.096**	0.096**	0.109**	0.103**	0.101**
	(0.018)	(0.068)	(0.030)	(0.015)	(0.011)	(0.030)	(0.035)	(0.024)	(0.023)	(0.022)
FCF	-0.011	-0.020	-0.030	-0.012	-0.010	-0.014	-0.009	-0.008	-0.012	-0.010
	(0.776)	(0.603)	(0.400)	(0.749)	(0.799)	(0.714)	(0.812)	(0.831)	(0.759)	(0.782)
QR	-0.001	-0.001	-0.001	-0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.820)	(0.636)	(0.813)	(0.875)	(0.847)	(0.701)	(0.709)	(0.600)	(0.810)	(0.794)
UNIQ	0.213*	0.239**	0.190*	0.211*	0.210*	0.061**	0.238**	0.219**	0.216**	0.213*
	(0.052)	(0.036)	(0.075)	(0.059)	(0.054)	(0.019)	(0.029)	(0.046)	(0.050)	(0.057)
M/B	-0.007	-0.006	-0.012***	-0.007	-0.008	-0.007	***0.022****	0.015	-0.007	-0.006
	(0.126)	(0.186)	(0.008)	(0.131)	(0.113)	(0.133)	***(0.025)***	(0.667)	(0.119)	(0.287)
DIV	-0.003	-0.003	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.001	-0.003
	(0.448)	(0.417)	(0.512)	(0.479)	(0.433)	(0.451)	(0.393)	(0.369)	(0.921)	(0.422)
LOGAGE	0.032	0.031	0.038	0.022	0.035	-0.022	-0.041	-0.036	0.034	-0.000
	(0.626)	(0.626)	(0.559)	(0.746)	(0.599)	(0.745)	(0.442)	(0.513)	(0.610)	(0.888)
INTERCEPT	-0.456*	-0.206	-0.558**	-0.434*	-0.473*	-0.445*	-0.219	-0.262	-0.464*	-0.429*
	(0.064)	(0.205)	(0.031)	(0.073)	(0.056)	(0.065)	(0.319)	(0.369)	(0.057)	(0.070)
F -test	**4.04*** **	**4.34*** **	**3.92*** **	**4.24*** **	**4.04*** **	**4.98*** **	**4.22*** **	**3.86*** **	**4.04*** **	**3.99*** **
R^2 within	**0.2023**	**0.1915**	**0.1966**	**0.2013**	**0.2022**	**0.2447**	**0.2111**	**0.1926**	**0.2013**	**0.2015**
R^2 between	**0.0729**	**0.0637**	**0.0684**	**0.0918**	**0.0713**	**0.0558**	**0.0903**	**0.0856**	**0.0689**	**0.0854**
R^2 overall	**0.0852**	**0.0787**	**0.0796**	**0.1039**	**0.0833**	**0.0717**	**0.1046**	**0.0975**	**0.0814**	**0.0972**
Corr (ui, x)	**-0.2442**	**-0.1422**	**-0.2787**	**-0.1756**	**-0.2615**	**-0.3158**	**-0.1457**	**-0.1697**	**-0.2504**	**-0.2145**
N	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**

Table-9: **Alternative proxies (total debt) Listed sample**

Listed TD	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	Growth (Assets)	DIV-DUM	Age
SIZE	0.004	0.055**	0.013	0.002	0.004	0.007	-0.014	-0.043	0.002	-0.001
	(0.964)	(0.012)	(0.874)	(0.982)	(0.964)	(0.930)	(0.855)	(0.666)	(0.978)	(0.995)
ROA	-0.183	-0.275**	-0.022	-0.181	-0.188*	-0.214*	-0.258**	-0.236**	-0.184*	-0.176
	(0.102)	(0.017)	(0.165)	(0.104)	(0.098)	(0.052)	(0.023)	(0.034)	(0.100)	(0.121)
TANG	0.092	0.077	0.085	0.076	0.095	0.077	0.081	0.119	0.087	0.099
	(0.234)	(0.333)	(0.271)	(0.303)	(0.220)	(0.314)	(0.299)	(0.155)	(0.275)	(0.199)
FCF	-0.183**	-0.173***	-0.204***	-0.185***	-0.184***	-0.184***	-0.180***	-0.161***	-0.183***	-0.186***
	(0.010)	(0.006)	(0.004)	(0.010)	(0.010)	(0.007)	(0.010)	(0.010)	(0.010)	(0.007)
QR	-0.008	-0.008	-0.008	-0.008	-0.006	-0.008	-0.008	-0.009*	-0.008	-0.008
	(0.149)	(0.171)	(0.149)	(0.156)	(0.196)	(0.113)	(0.136)	(0.060)	(0.123)	(0.146)
UNIQ	0.187	0.220	0.171	0.189	0.198	0.074**	0.217	0.206	0.190	0.187
	(0.267)	(0.202)	(0.303)	(0.270)	(0.237)	(0.014)	(0.176)	(0.191)	(0.267)	(0.254)
M/B	-0.005	-0.006	-0.009	-0.005	-0.005	-0.004	0.028*	0.080	-0.004	-0.008
	(0.431)	(0.322)	(0.106)	(0.435)	(0.430)	(0.455)	(0.071)	(0.227)	(0.491)	(0.270)
DIV	-0.003	-0.002	-0.002	-0.003	-0.002	-0.003	-0.003	-0.003	-0.008	-0.003
	(0.603)	(0.759)	(0.665)	(0.630)	(0.700)	(0.623)	(0.601)	(0.631)	(0.472)	(0.656)
LOGAGE	-0.087	-0.143	-0.079	-0.098	-0.084	-0.152	-0.138	-0.144	-0.083	-0.000
	(0.455)	(0.134)	(0.508)	(0.396)	(0.470)	(0.166)	(0.175)	(0.131)	(0.482)	(0.937)
INTERCEPT	0.183	-0.155	0.091	0.212	0.177	0.201	0.405	0.647	0.195	0.114
	(0.776)	(0.472)	(0.888)	(0.738)	(0.782)	(0.754)	(0.519)	(0.430)	(0.761)	(0.862)
F -test	**5.15*** **	**6.67*** **	**4.83*** **	**5.15*** **	**5.07*** **	**6.33*** **	**6.05*** **	**6.71*** **	**5.27*** **	**4.91*** **
R^2 within	**0.2216**	**0.2453**	**0.2153**	**0.2194**	**0.2195**	**0.2565**	**0.2337**	**0.2351**	**0.2228**	**0.2186**
R^2 between	**0.0473**	**0.1394**	**0.0798**	**0.0798**	**0.0396**	**0.0674**	**0.0348**	**0.0160**	**0.0467**	**0.0305**
R^2 overall	**0.0680**	**0.1535**	**0.0983**	**0.0983**	**0.0599**	**0.0894**	**0.0537**	**0.0306**	**0.0674**	**0.0517**
Corr (ui, x)	**-0.1376**	**-0.0845**	**-0.0593**	**-0.0593**	**-0.1568**	**-0.1676**	**-0.2344**	**-0.3446**	**-0.1411**	**-0.1472**
N	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**

Table-10: **Alternative proxies (short-term debt) Unlisted sample**

Unlisted STD	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	DIV-DUM	Age
SIZE	0.066***	***0.040****	0.067***	.067***	0.061***	0.066***	0.052***	0.065***	0.071***
	(0.003)	***(0.022)***	(0.003)	(0.003)	(0.006)	(0.003)	(0.008)	(0.003)	(0.001)
ROA	-0.082***	-0.126***	***-0.015***	-0.081***	-0.074***	-0.082***	-0.065**	-0.083***	-0.082***
	(0.003)	(0.000)	***(0.593)***	(0.003)	(0.008)	(0.003)	(0.027)	(0.003)	(0.003)
TANG	-0.030	-0.036	-0.033	***-0.014***	-0.039	-0.032	-0.025	-0.030	-0.032
	(0.426)	(0.324)	(0.389)	***(0.674)***	(0.320)	(0.412)	(0.510)	(0.435)	(0.400)
FCF	-0.110***	-0.109***	-0.118***	-0.109***	-0.111***	-0.109***	-0.103***	-0.109***	-0.107***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
QR	-0.020***	-0.020***	-0.022***	-0.020***	***-0.020****	-0.020***	-0.020***	-0.020***	-0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	***(0.000)***	(0.000)	(0.000)	(0.000)	(0.000)
UNIQ	-0.053	-0.011	-0.055	-0.055	-0.052	***-0.009***	-0.061	-0.056	-0.048
	(0.572)	(0.902)	(0.557)	(0.562)	(0.581)	***(0.609)***	(0.522)	(0.550)	(0.611)
G. Assets	-0.025**	-0.016	-0.024**	-0.025**	-0.027**	-0.025**	***-0.012***	-0.026**	-0.026**
	(0.023)	(0.121)	(0.026)	(0.025)	(0.016)	(0.025)	***(0.127)***	(0.018)	(0.018)
DIV	0.003	0.003	0.004	0.003	0.004	0.003	0.004	***0.001***	0.004*
	(0.125)	(0.123)	(0.108)	(0.125)	(0.112)	(0.120)	(0.112)	***(0.839)***	(0.096)
LOGAGE	0.095***	0.098***	0.087**	0.096***	0.094***	0.096***	0.099***	0.097***	***0.003****
	(0.006)	(0.005)	(0.013)	(0.006)	(0.006)	(0.005)	(0.003)	(0.005)	***(0.022)***
INTERCEPT	-0.401**	-0.200*	-0.416**	-0.418**	-0.358**	-0.405**	-0.311**	-0.401**	-0.379**
	(0.013)	(0.093)	(0.011)	(0.011)	(0.026)	(0.011)	(0.032)	(0.013)	(0.018)
F -test	***13.87****	***13.57****	***12.30****	***13.64****	***13.47****	***13.87****	***13.71****	***13.77****	***13.02****
R^2 within	**0.1218**	**0.1211**	**0.1155**	**0.1214**	**0.1294**	**0.1217**	**0.1198**	**0.1207**	**0.1200**
R^2 between	**0.1838**	**0.1817**	**0.1890**	**0.1775**	**0.2010**	**0.1856**	**0.1844**	**0.1836**	**0.1877**
R^2 overall	**0.1722**	**0.1699**	**0.1752**	**0.1670**	**0.1876**	**0.1737**	**0.1721**	**0.1719**	**0.1750**
Corr (ui, x)	**-0.0104**	**0.0601**	**0.0269**	**-0.0274**	**0.0127**	**-0.0064**	**0.0439**	**-0.0118**	**-0.0118**
N	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**

Table-11: **Alternative proxies (long-term debt) Unlisted sample**

	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	DIV-DUM	Age
SIZE	0.024***	***0.008*****	0.025***	0.022***	0.025***	0.024***	0.020***	0.024***	0.024***
	(0.000)	***(0.002)***	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.014*	-0.024***	***0.000***	-0.016**	-0.015*	-0.015*	-0.014*	-0.014*	-0.014*
	(0.072)	(0.005)	***(0.957)***	(0.048)	(0.052)	(0.068)	(0.095)	(0.071)	(0.082)
TANG	0.048***	0.043**	0.048***	***0.029****	0.049***	0.048***	0.049***	0.048***	0.048***
	(0.007)	(0.011)	(0.008)	***(0.014)***	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)
FCF	-0.002	-0.002	-0.004	-0.002	-0.002	-0.002	-0.001	-0.002	-0.003
	(0.415)	(0.531)	(0.164)	(0.394)	(0.466)	(0.406)	(0.826)	(0.456)	(0.212)
QR	0.001	0.001	0.001	0.001	***0.001***	0.001	0.001	0.001	0.001
	(0.292)	(0.428)	(0.468)	(0.323)	***(0.181)***	(0.293)	(0.276)	(0.272)	(0.286)
UNIQ	0.007	0.017	0.006	0.008	0.007	***0.003***	0.008	0.006	0.006
	(0.830)	(0.584)	(0.847)	(0.795)	(0.824)	***(0.564)***	(0.790)	(0.844)	(0.844)
G. Assets	-0.005**	-0.000	-0.005**	-0.005**	-0.005**	-0.005**	***0.000***	-0.005**	-0.005**
	(0.034)	(0.903)	(0.034)	(0.049)	(0.039)	(0.031)	***(0.994)***	(0.025)	(0.034)
DIV	0.001	0.001	0.001	0.001	0.001	0.001	0.001	***-0.001***	0.001
	(0.270)	(0.268)	(0.246)	(0.286)	(0.282)	(0.275)	(0.199)	***(0.781)***	(0.308)
LOGAGE	-0.044***	-0.037***	-0.045***	-0.047***	-0.044***	-0.045***	-0.043***	-0.043***	***-0.002*****
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	***(0.000)***
INTERCEPT	-0.118***	-0.002	-0.121***	-0.101***	-0.124***	-0.116***	-0.090**	-0.119***	-0.137***
	(0.005)	(0.992)	(0.004)	(0.006)	(0.003)	(0.006)	(0.031)	(0.004)	(0.001)
F -test	***3.33*****	**2.91*****	***3.24*****	***3.68*****	***3.43*****	***3.44*****	***3.03*****	***3.17*****	***4.15*****
R^2 within	**0.0278**	**0.0208**	**0.0261**	**0.0223**	**0.0286**	**0.0280**	**0.0265**	**0.0275**	**0.0310**
R^2 between	**0.2315**	**0.2036**	**0.2214**	**0.1800**	**0.2354**	**0.2323**	**0.2379**	**0.2361**	**0.2015**
R^2 overall	**0.1949**	**0.1683**	**0.1863**	**0.1516**	**0.1983**	**0.1957**	**0.1995**	**0.1986**	**0.1712**
Corr (ui, x)	**0.1217**	**0.2258**	**0.1267**	**0.1203**	**0.1231**	**0.1243**	**0.1669**	**0.1326**	**0.0515**
N	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**

Table-12: **Alternative proxies (total debt) Unlisted sample**

	Basic	LOG-Sales	ROS	T. Asset & Invent.	CR	UNIQ-DUM	Growth (Sales)	DIV-DUM	Age
SIZE	0.097***	***0.038****	0.099***	0.095***	0.093***	0.097***	0.076***	0.096***	0.101***
	(0.000)	***(0.030)***	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.119***	-0.162***	***-0.035***	-0.121***	-0.112***	-0.119***	-0.102***	-0.120***	-0.117***
	(0.000)	(0.000)	***(0.237)***	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
TANG	0.051	0.034	0.046	***0.031***	0.044	0.052	0.058	0.052	0.050
	(0.212)	(0.397)	(0.262)	***(0.358)***	(0.281)	(0.198)	(0.153)	(0.204)	(0.222)
FCF	-0.119***	-0.117***	-0.131***	-0.119***	-0.120***	-0.120***	-0.109***	-0.118***	-0.119***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
QR	-0.019***	-0.020***	-0.021***	-0.019***	***-0.019****	-0.019***	-0.019***	-0.019***	-0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	***(0.000)***	(0.000)	(0.000)	(0.000)	(0.000)
UNIQ	0.103	0.148*	0.103	0.104	0.105	***0.005***	0.099	0.099	0.106
	(0.239)	(0.094)	(0.230)	(0.232)	(0.227)	***(0.805)***	(0.262)	(0.258)	(0.225)
G. Assets	-0.034***	-0.016	-0.032***	-0.034***	-0.035***	-0.034***	***-0.011***	-0.035***	-0.034***
	(0.004)	(0.131)	(0.006)	(0.005)	(0.003)	(0.004)	***(0.157)***	(0.003)	(0.003)
DIV	0.005**	0.005**	0.005**	0.005**	0.005**	0.005**	0.006**	***0.001***	0.005**
	(0.031)	(0.030)	(0.023)	(0.031)	(0.027)	(0.035)	(0.021)	***(0.835)***	(0.026)
LOGAGE	0.006	0.030	-0.007	0.003	0.006	0.007	0.013	0.011	***-0.001***
	(0.865)	(0.410)	(0.854)	(0.928)	(0.871)	(0.841)	(0.696)	(0.760)	***(0.551)***
INTERCEPT	-0.519***	-0.091	-0.536**	-0.501***	-0.483***	-0.519**	-0.379**	-0.519***	-0.532***
	(0.002)	(0.440)	(0.001)	(0.003)	(0.004)	(0.002)	(0.011)	(0.002)	(0.001)
F -test	**14.70*** **	**13.54*** **	**12.70*** **	**14.48*** **	**14.71*** **	**14.75*** **	**14.36*** **	**14.40*** **	**14.53*** **
R^2 within	**0.1311**	**0.1217**	**0.1204**	**0.1305**	**0.1357**	**0.1304**	**0.1267**	**0.1290**	**0.1313**
R^2 between	**0.2448**	**0.2180**	**0.2339**	**0.2432**	**0.2493**	**0.2432**	**0.2434**	**0.2467**	**0.2376**
R^2 overall	**0.2267**	**0.1989**	**0.2157**	**0.2252**	**0.2311**	**0.2253**	**0.2239**	**0.2280**	**0.2207**
Corr (ui, x)	**0.0331**	**0.1553**	**0.0581**	**0.0442**	**0.0456**	**0.0325**	**0.1026**	**0.0340**	**0.0229**
N	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**

Appendix 6

Table-13: **Estimation robustness (Listed and Unlisted samples)**

	Listed (n =300)						Unlisted (n =2015)					
	STD		LTD		TD		STD		LTD		TD	
	OLS	Newey	OLS	Newey	OLS	Newey	OLS	Newey	OLS	Newey	OLS	Newey
LOGASSETS	0.016	0.016	0.033***	0.033**	0.050***	0.050**	0.059***	0.059***	0.019***	0.019***	0.091***	0.091***
	(0.111)	(0.182)	(0.004)	(0.023)	(0.002)	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.224***	0.224***	-0.227***	-0.227***	0.003	0.003	-0.046**	-0.046**	-0.040***	-0.040***	-0.117***	-0.117***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.967)	(0.971)	(0.038)	(0.038)	(0.000)	(0.000)	(0.000)	(0.000)
TANG1	0.001	0.001	0.086***	0.086***	0.086**	0.086*	-0.115***	-0.115***	0.092***	0.092***	0.035	0.035
	(0.938)	(0.951)	(0.000)	(0.005)	(0.013)	(0.057)	(0.000)	(0.000)	(0.000)	(0.000)	(0.114)	(0.114)
FCF	-0.248***	-0.248***	-0.054	-0.054	-0.339***	-0.339***	-0.124***	-0.124***	-0.011**	-0.011**	-0.144***	-0.144***
	(0.002)	(0.004)	(0.462)	(0.477)	(0.003)	(0.005)	(0.000)	(0.000)	(0.021)	(0.021)	(0.000)	(0.000)
QR	-0.010**	-0.010**	-0.005	-0.005	-0.016***	-0.016***	-0.032***	-0.032***	0.002*	0.002*	-0.028***	-0.028***
	(0.024)	(0.037)	(0.132)	(0.166)	(0.005)	(0.008)	(0.000)	(0.000)	(0.051)	(0.051)	(0.000)	(0.000)
UNIQ	-0.014	-0.014	-0.027	-0.027	-0.055	-0.055	0.001	0.001	0.049***	0.049***	0.077	0.077
	(0.806)	(0.839)	(0.669)	(0.725)	(0.541)	(0.618)	(0.991)	(0.991)	(0.005)	(0.005)	(0.163)	(0.163)
M/B	-0.003	-0.003	-0.006	-0.006	-0.008	-0.008						
	(0.414)	(0.446)	(0.169)	(0.230)	(0.204)	(0.244)						
G Assets							-0.044***	-0.044***	-0.011***	-0.011***	-0.067***	-0.067***
							(0.001)	(0.001)	(0.004)	(0.004)	(0.000)	(0.000)
DIVID	-0.009	-0.009	-0.024**	-0.024**	-0.034**	-0.034**	-0.002	-0.002	-0.002	-0.002	-0.005	-0.005
	(0.184)	(0.221)	(0.019)	(0.028)	(0.015)	(0.023)	(0.613)	(0.638)	(0.238)	(0.242)	(0.229)	(0.260)
LOGAGE	-0.048**	-0.048*	-0.026	-0.026	-0.074**	-0.074*	0.081***	0.081***	-0.020***	-0.020***	0.054***	0.054**
	(0.038)	(0.095)	(0.240)	(0.355)	(0.024)	(0.074)	(0.000)	(0.000)	(0.000)	(0.004)	(0.005)	(0.028)
RISK	-0.001	-0.001	0.003	0.003	0.002	0.002	0.0001**	0.0001**	0.0001	0.0001	0.0001*	0.0001*
	(0.763)	(0.763)	(0.293)	(0.284)	(0.657)	(0.664)	(0.040)	(0.041)	(0.572)	(0.573)	(0.084)	(0.085)
GOV	-0.085***	-0.085***	-0.020	-0.020	-0.103***	-0.103**						
	(0.000)	(0.002)	(0.456)	(0.560)	(0.005)	(0.026)						
MINDUM	0.040***	0.040***	0.067***	0.067***	0.109***	0.109***	0.005	0.005	0.016***	0.016***	0.019*	0.019
	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.541)	(0.636)	(0.000)	(0.000)	(0.068)	(0.158)
CEMEDUM	0.032**	0.032**	0.044**	0.044*	0.081***	0.081**						
	(0.016)	(0.044)	(0.043)	(0.098)	(0.003)	(0.015)						
FARMDUM	-0.008	-0.008	-0.016	-0.016	-0.023	-0.023	-0.028	-0.028	-0.001	-0.001	-0.051**	-0.051
	(0.444)	(0.523)	(0.276)	(0.382)	(0.243)	(0.343)	(0.223)	(0.356)	(0.908)	(0.929)	(0.041)	(0.122)
INTERCIPT	-0.030	-0.030	-0.222**	-0.222*	-0.249*	-0.249	-0.309***	-0.309***	-0.114***	-0.114***	-0.511***	-0.511***
	(0.751)	(0.795)	(0.030)	(0.089)	(0.084)	(0.171)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
F test	7.98***	4.96***	6.59***	4.30***	10.42***	6.57***	51.81***	32.83***	31.26***	19.18***	66.69***	41.79***
Adjusted R^2	0.2589	0. 2589	0.2395	0.2395	0.3094	0.3094	0.1878	0.1878	0.2565	0.2565	0.2330	0.2330

Appendix 7

Table-14: **Pair-wise correlation for listed sample**

	Log Sales	*Log Assets*	ROA	*ROS*	TANG1 (Fixed)	*TANG2 (F&Inv)*	FCF	*CR*	QR	UNIQ	*UNIQ DUM*	M/B	*G. Sales*	*G. Assets*	DIV	*DIV-DUM*	*AGE*	LOG-AGE	RISK	GOV	MIN-DUM	FAR-DUM	CEM-DUM
Log sales	1																						
Log Assets	*0.84***	*1*																					
ROA	**0.50***	***0.22*****	**1**																				
ROS	*0.19***	*0.22***	*0.43***	*1*																			
TANG1	**0.09**	***0.22*****	**-0.06**	***0.05***	1																		
TANG2	*0.19***	*0.21***	*0.08*	*0.04*	*0.92***	*1*																	
FCF	**0.27***	***0.17*****	**0.43***	***0.24*****	**-0.02**	***0.00***	1																
CR	*0.02*	*-0.04*	*0.14***	*0.07*	*-0.15***	*-0.11***	*0.21***	*1*															
QR	**-0.02**	***-0.05***	**0.09**	***0.07***	**-0.15****	***-0.23*****	**0.19*****	***0.91*****	**1**														
UNIQ	**-0.09**	***-0.15*****	**0.11***	***-0.15*****	**-0.07**	***-0.01***	**-0.26*****	***0.03***	**-0.02**	**1**													
UNIQDUM	*0.25***	*0.07*	*0.21***	*-0.08*	*0.03*	*0.10**	*0.00*	*0.16***	*0.12***	*0.44***	*1*												
M/B	**0.29***	***0.23*****	**0.46***	***0.20*****	**-0.00**	***-0.01***	**0.47*****	***0.27*****	**0.27*****	**-0.28*****	***0.05***	**1**											
G. Sales	*0.25***	*0.18***	*0.18***	*0.20***	*-0.03*	*-0.01*	*0.07*	*0.01*	*0.00*	*-0.04*	*0.13***	*0.18***	*1*										
G. Assets	*0.08*	*0.13***	*0.08*	*0.12***	*-0.27***	*-0.28***	*-0.15***	*0.05*	*0.11**	*-0.04*	*-0.00*	*0.19***	*0.32***	*1*									
DIV	**0.26***	***0.21*****	**0.27***	***0.18*****	**-0.03**	***0.03***	**0.29*****	***0.07***	**-0.01**	**-0.09**	***0.05***	**0.16****	***-0.03***	***-0.05***	**1**								
DIV DUM	*0.38***	*0.36***	*0.35***	*0.28***	*0.01*	*0.03*	*0.38***	*0.07*	*0.04*	*-0.10**	*0.01*	*0.34***	*0.12***	*-0.02*	*0.62***	*1*							
AGE	*0.24***	*0.25***	*0.17***	*0.23***	*0.06*	*0.01*	*0.28***	*0.20***	*0.20***	*-0.17***	*0.11***	*0.40***	*0.03*	*0.04*	*0.18***	*0.35***	*1*						
LOG-AGE	**0.16****	***0.18*****	**0.02**	***0.18*****	**0.07**	***-0.02***	**0.17*****	***0.17*****	**0.19*****	**-0.12****	***0.13*****	**0.33*****	***-0.01***	***0.02***	**0.10***	***0.25*****	***0.93*****	**1**					
RISK	**-0.02**	***0.02***	**0.06**	***-0.04***	**-0.07**	***-0.08***	**-0.05**	***0.02***	**0.01**	**0.16****	***-0.08***	**0.06**	***0.06***	***0.24*****	**0.02**	***0.03***	***-0.10****	**-0.09**	**1**				
GOV	**0.47*****	***0.57*****	**0.12****	***0.13*****	**0.32*****	***0.24*****	**0.13****	***-0.00***	**0.01**	**-0.10***	***0.03***	**0.13****	***-0.02***	***-0.07***	**0.14****	***0.27*****	***0.16*****	**0.18*****	**-0.01**	**1**			
MIN-DUM	**0.09**	***0.04***	**0.11***	***-0.01***	**-0.31*****	***-0.25*****	**-0.08-**	***-0.16*****	**-0.14****	**0.11***	***-0.03***	**-0.05**	***0.10****	***0.21*****	**-0.09**	***-0.10****	***-0.09***	**-0.10***	**-0.03**	**-0.21*****	**1**		
FAR-DUM	**-0.30*****	***-0.30*****	**-0.20*****	***-0.24*****	**0.14****	***0.14*****	**-0.14****	***0.10****	**0.08**	**0.44*****	***0.14*****	**-0.27*****	***-0.13*****	***-0.11****	**-0.15****	***-0.21*****	***-0.09***	**-0.01**	**-0.04**	**-0.06**	**-0.35*****	**1**	
CEM-DUM	**0.21*****	***0.22*****	**0.32*****	***0.25*****	**0.08**	***0.09***	**0.52*****	***0.42*****	**0.39*****	**-0.24*****	***0.23*****	**0.51*****	***0.11****	***-0.03***	**0.20*****	***0.31*****	***0.48*****	**0.40*****	**-0.05**	**0.14****	**-0.33*****	**-0.16*****	**1**

Table-15: **Pair-wise correlation for unlisted sample.**

	Log Sales	*Log Assets*	ROA	*ROS*	TANG (Fixed)	*TANG (F&Inv)*	FCF	*CR*	QR	UNIQ	*UNIQ-DUM*	*G. Sales*	G. Assets	DIV	*DIV-DUM*	*AGE*	LOG AGE	RISK	MIN-DUM	FAR-DUM
Log Sales	**1**																			
Log Assets	*0.88***	*1*																		
ROA	**-0.02**	***-0.31*****	**1**																	
ROS	*-0.25***	*-0.15****	*0.53****	*1*																
TANG 1	**0.03**	***0.13*****	**-0.13*****	***0.03***	1															
TANG 2	*0.02*	*0.06***	*-0.03*	*0.05***	*0.74****	*1*														
FCF	**0.08*****	***-0.02***	**0.29*****	***0.13*****	**-0.08*****	***-0.09*****	**1**													
CR	*-0.27****	*-0.26****	*0.19****	*0.27****	*-0.15****	*-0.09****	*0.13****	*1*												
QR	**-0.26*****	***-0.24*****	**0.17*****	***0.25*****	**-0.19*****	***-0.33*****	**0.15*****	***0.92*****	**1**											
UNIQ	**0.06*****	***0.10*****	**0.17*****	***0.26*****	**0.11*****	***0.25*****	**-0.05****	***-0.09*****	**-0.17*****	**1**										
UNIQDUM	*0.28****	*0.27****	*0.08****	*0.05***	*0.14****	*0.30****	*-0.01*	*-0.07****	*-0.18****	*0.63****	*1*									
G. Sale	*0.14****	*0.06***	*0.11****	*-0.02*	*0.02*	*0.00*	*-0.06***	*-0.04**	*-0.04**	*-0.01*	*0.04**	*1*								
G. Assets	**0.08*****	***0.09*****	**0.00**	***0.05*****	**-0.04***	***-0.06*****	**-0.26*****	***-0.07*****	**-0.05*****	**-0.02**	***0.04****	***0.45*****	**1**							
DIV	**0.10*****	***0.05*****	**0.10*****	***-0.01***	**-0.09*****	***-0.07*****	**0.18*****	***0.08*****	**0.09*****	**-0.10*****	***-0.03***	***-0.12*****	**-0.11*****	**1**						
DIVDUM	*0.24****	*0.15****	*0.20****	*0.02*	*-0.05***	*-0.04**	*0.25****	*0.06***	*0.07****	*-0.10****	*0.04*	*-0.07****	*-0.05***	*0.55****	*1*					
AGE	*0.34****	*0.33****	*-0.07****	*-0.07****	*0.03*	*0.06***	*0.09****	*-0.07****	*-0.09****	*0.02*	*0.14****	*-0.05***	*-0.05***	*0.07****	*0.17****	*1*				
LOGAGE	**0.33*****	***0.31*****	**-0.05*****	***-0.06*****	**0.03**	***0.06*****	**0.11*****	***-0.06*****	**-0.08*****	**0.04***	***0.15*****	***-0.06*****	**-0.06*****	**0.08*****	***0.17*****	***0.95*****	**1**			
RISK	**-0.02**	***-0.07*****	**0.13*****	***0.10*****	**-0.05*****	***-0.06*****	**0.06*****	***0.11*****	**0.11*****	**-0.11*****	***-0.07*****	***0.05*****	**0.07*****	**0.03**	***0.07*****	***0.02***	**-0.00**	**1**		
MIN-DUM	**0.08*****	***0.13*****	**-0.04***	***0.08*****	**0.38*****	***0.40*****	**0.01**	***0.01***	**-0.09*****	**0.20*****	***0.28*****	***0.03***	**0.02**	**-0.04***	***0.02***	***0.05*****	**0.04***	**-0.01**	**1**	
FAR-DUM	**0.11*****	***0.13*****	**-0.00**	***0.01***	**0.08*****	***0.07*****	**0.01**	***-0.03***	**-0.04***	**0.17*****	***0.18*****	***0.01***	**-0.01**	**-0.00**	***0.02***	***0.07*****	**0.10*****	**-0.08*****	**-0.13*****	**1**

Appendix 8

Table-16: **DFIT regression results**

STD, LTD and TD refer to short-term, long-term, and total debt respectively. Size is the log of total assets. ROA refers to the return on assets. TANG is the ratio of fixed assets to total assets. FCF refers to the earnings before interest and tax plus depreciation less capital expenditure normalised by total assets. QR refers to the quick ratio. UNIQ is the ratio of selling & marketing expenses to total sales. M/B refers to the market to book ratio and G.ASSETS is the growth in assets for listed and unlisted companies. DIV refers to dividends paid divided by net income. LOGAGE is the log number of years since firm founded.
Note: White's heteroskedastic-consistent covariance matrix estimation is used to adjust for heteroskedasticity. Probability of (t) are in parentheses for. *, ** and *** denote significant at the 10, 5, and 1% respectively (two tails).

Panel	**Listed**			**Unlisted**		
	STD	**LTD**	**TD**	**STD**	**LTD**	**TD**
LOGASSETS	0.039**	0.046*	*0.111***	0.064***	0.022***	0.098***
	(0.049)	(0.082)	(0.009)	(0.004)	(0.000)	(0.000)
ROA	0.060	-0.224***	-0.111	-0.071***	-0.015*	-0.117***
	(0.230)	(0.002)	(0.216)	(0.009)	(0.055)	(0.000)
TANG1	0.030	0.112**	0.107	-0.037	0.045**	0.059
	(0.466)	(0.013)	(0.116)	(0.307)	(0.013)	(0.149)
FCF	-0.085**	0.023	-0.103*	-0.109***	-0.001	-0.122***
	(0.013)	(0.386)	(0.058)	(0.000)	(0.691)	(0.000)
QR	-0.009***	0.000	-0.012***	-0.021***	0.001	-0.020***
	(0.000)	(0.975)	(0.006)	(0.000)	(0.353)	(0.000)
UNIQ	0.049	0.224**	0.343**	-0.026	0.009	0.128
	(0.557)	(0.040)	(0.048)	(0.779)	(0.780)	(0.134)
M/B	-0.001	-0.006	-0.007			
	(0.762)	(0.182)	(0.160)			
G. Assets				-0.023**	-0.006**	-0.034***
				(0.022)	(0.011)	(0.003)
DIV	0.000	-0.006	-0.001	0.003	0.000	0.005**
	(0.971)	(0.110)	(0.866)	(0.144)	(0.567)	(0.027)
LOGAGE	-0.141*	0.021	-0.198**	0.089***	-0.050***	0.000
	(0.013)	(0.742)	(0.016)	(0.009)	(0.000)	(0.997)
INTERCEPT	-0.119	-0.407*	-0.648*	-0.385**	-0.094**	-0.525***
	(0.487)	(0.097)	(0.088)	(0.015)	(0.018)	(0.002)
F -test	6.71***	4.02***	9.88***	14.01***	**3.32*** **	**15.20*** **
R^2 within	0.2122	0.2148	0.3231	0.1259	**0.0299**	**0.1412**
R^2 between	0.0752	0.0788	0.0826	0.1976	**0.2167**	**0.2544**
R^2 overall	**0.0825**	**0.0943**	**0.1033**	**0.1846**	**0.1809**	**0.2356**
Corr (ui, x)	**-0.3153**	**-0.2356**	**-0.3703**	**0.0028**	**0.1125**	**0.0179**
N	295	298	296	2002	**1998**	**2002**

Appendix 9

Figure -2: **Normal Probability Plot for Short-term debt (Listed)**

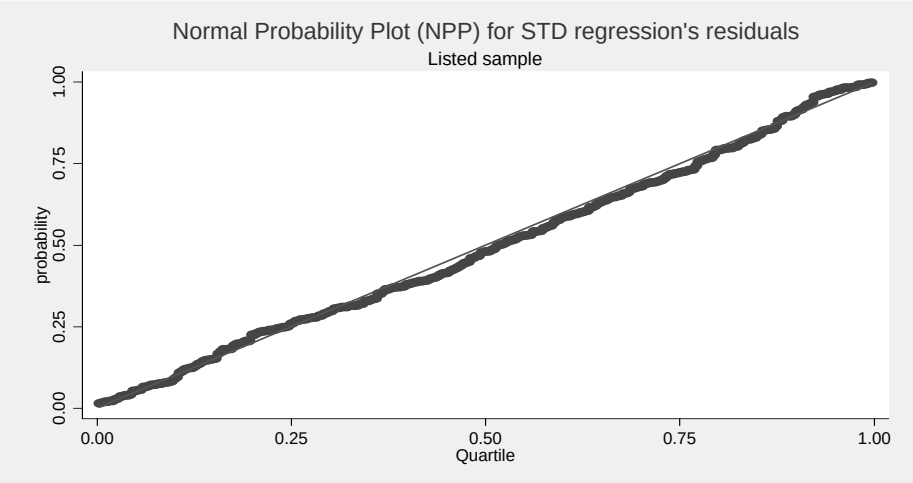


Figure -3: **Normal Probability Plot for Long-term debt (Listed)**

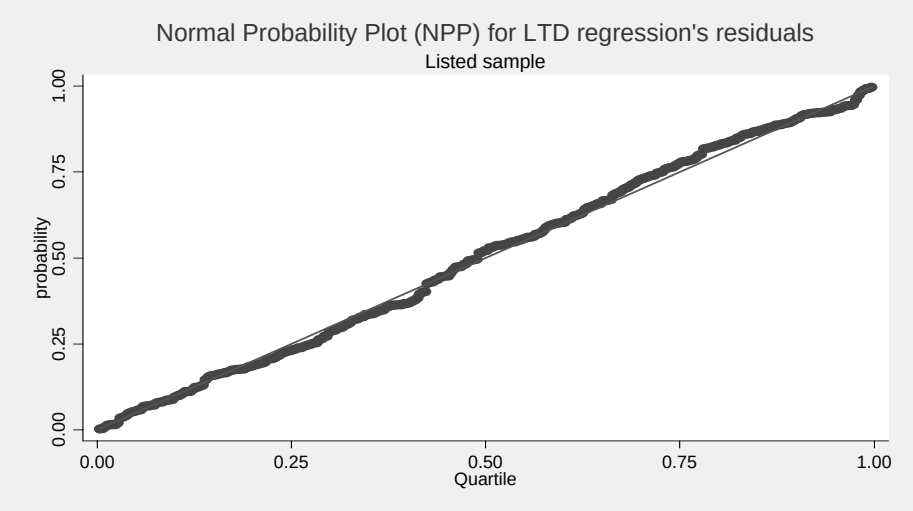


Figure -4: **Normal Probability Plot for Total debt (Listed)**

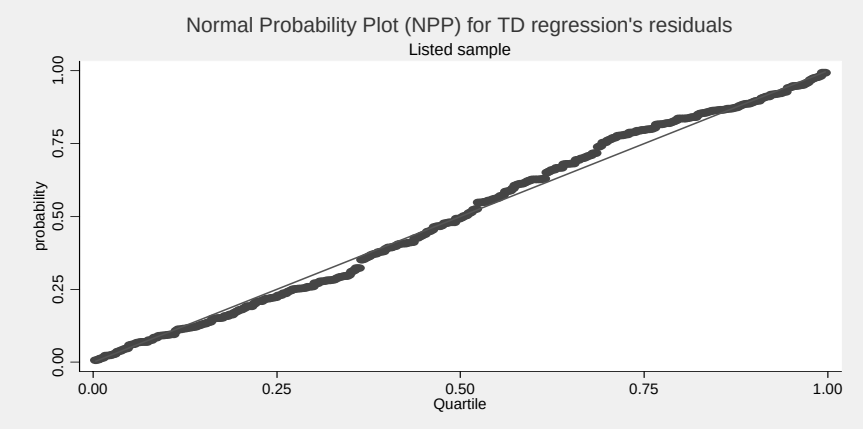


Figure -5: **Normal Probability Plot for Short-term debt (Unlisted)**

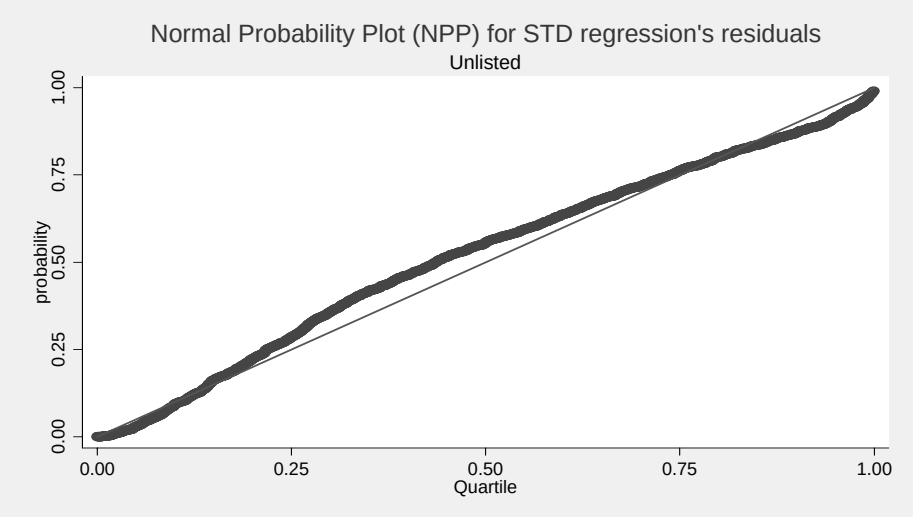


Figure -6**: Normal Probability Plot for Long-term debt (Unlisted)**

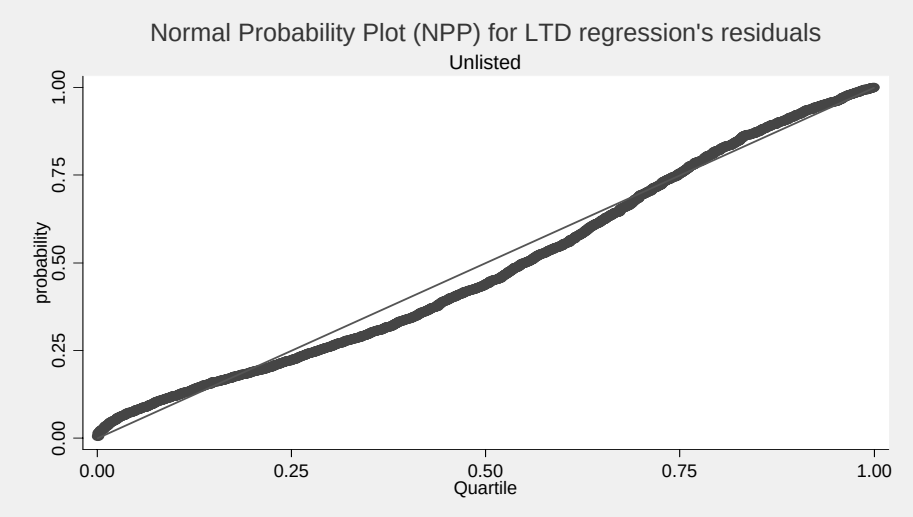


Figure -7: **Normal Probability Plot for Total debt (Unlisted)**