

THE DETERMINANTS OF CORPORATE
BORROWING IN THE
ARAB WORLD

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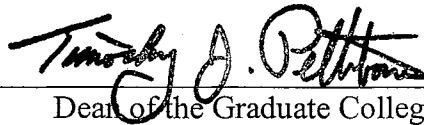
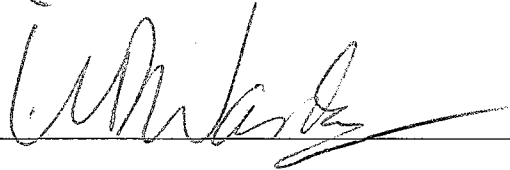
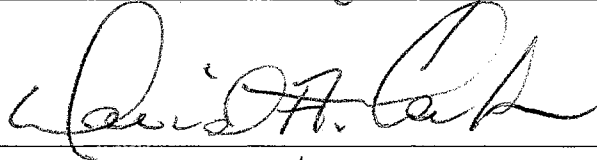
Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
August, 2003

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PREFACE

Formal development of capital structure theory began with the celebrated paper of Miller and Modigliani (1958). Their work triggered intense scrutiny and often bitter controversy as observed by Miller (1988). After forty five years and hundreds of theoretical and empirical papers in the US, developed, and developing countries it is still safe to ask what Myers asked in his (1984) seminal paper, “How do firms choose their capital structure?” The answer remains, “We don’t know”. He added: “In general, we have inadequate understanding of corporate financing behavior and of how that behavior affects security returns”.

Theories have tried to explain firms’ financing behavior through the Static Tradeoff (STO) and the Pecking Order Hypothesis (POH). These frameworks take into account numerous factors in their explanations of the debt/equity choice of financing. Whether it is STO or POH, the determinants of corporate capital borrowing are summarized in the debt tax shield benefits, agency and bankruptcy costs, asymmetry of information, corporate control factors, input/product market factors and control variables like size, tangible assets, interest rates among others. Some of these control variables are empirical and have no theoretical foundation to support them.

This dissertation attempts to test the models of capital structure theory in the Arab world, an environment that is different from that where the theory was born i.e. Western economies. A sample of 3-6 year panel data from the 12 Arab countries (Bahrain, Egypt,

Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates) that have stock markets is used.

Maximum likelihood and TOBIT models are used to regress 6 debt ratios on a host of theory and empirical determinants of capital structure.

Due to institutional factors and country traditions, the regressions show mixed results on the directions, magnitudes and levels of significance of these determinants. Arab countries are divided into tax countries and non-tax countries (Gulf States usually have no tax regime in place). The results support the tax models of capital structure while they do not support the Agency and information asymmetry models. Moreover, Arab firms are found to follow a reverse POH. Country of origin is found to be a significant factor in determining the firm's capital structure. These results are consistent with the general findings in developing countries and partially with those in developed countries. The differences show that the theory of capital structure is not robust and needs to be either amended or expanded to include such patterns.

There are so many people I need to thank that I don't know by whom to start. I am grateful to the help, patience and guidance of my dissertation committee members: Professor Ramesh P. Rao (chairman), Professors Thomas F. Gosnell Jr., David A. Carter and William D. Warde.

A debt of gratitude is owed to Professor Ramesh P. Rao for his help since the inception of the idea of this dissertation. The help I got from virtually every member of the finance department at Oklahoma State University is also greatly appreciated and recognized. I am grateful to the professors in the economics department for their help to jump start my PhD program especially Professors Dan Rickman and Keith Willett. I would also like to thank Dr. Wade Brorson for his help in building the models and in

helping with the SAS codes for this dissertation, Dr. Janice Jadow and Dr. John Polonchek for their guidance and advice. Finally, I would like to thank Jo Anne Duncan for her continued support and encouragement throughout the program, Francis Griffin and Keith Loyd for helping with technical writing.

For their patience, love and support, I want to thank my wife Sherin Alimari, my two sons Hussein and Abdallah and the new blessing Emmatullah. This dissertation is dedicated to my father –may he rest in peace- and to my mother, they always wanted a professor in the family.

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CHAPTER I

INTRODUCTION

Myers (1984) suggested that capital structure was a puzzle then. Since then numerous empirical tests have been conducted and various new theories have been developed; nonetheless, no one has been able to conclusively explain why and how capital structure decisions are made. This would lead us to believe that capital structure is still a puzzle now as it was then. Beside problems with empirical tests and the use of different estimation techniques, the apparent reason for this puzzle is that the potential factors that significantly affect firms' choice of capital structure are numerous. Some of these factors have been accounted for in some models, but no single model has been able to include all of them. The reasons include the following:

- 1- The scarcity of data or the fact that the factor is unobservable and cannot be proxied for by any other factor. The anomalous behavior of a firm's management would be one of these factors. Miller (1977) and Myers (1984) described these anomalies as neutral mutation, which means that a firm's choice of capital structure is arbitrary and it has no effect on firm value.
- 2- Differences exist amongst the environments in which firms operate. For example, Singh and Hamid (1992) found that special country traditions and institutional factors explain why developing countries follow a reverse pecking order. Booth, et al. (2001) found that capital structure choice is partially explained by the

country of the firm's origin. None of the capital structure theories developed thus far, accounts for these country traditions and institutional factors in explaining capital structure decisions.

3- Theories do not agree on the driving reasons for the choice of the level of leverage a firm may pursue. For instance, while the Static Tradeoff (STO) theory suggests that firms have an optimal debt target in mind, and that they keep adjusting to maintain that level of leverage, the Pecking Order Hypothesis (POH) suggests that firms only follow a capital structure that reveals the least amount of information about the firm and there is never a target capital structure.

In summary, the problems are with both theory (a comprehensive theory that includes all the factors that affect the capital structure decision is yet to be developed) and empirical works (empirical studies either choose proxies arbitrarily or do not include all the factors that may influence the choice of capital structure).

In their value-maximizing efforts, firms pursue strategies and policies that are consistent with this objective. One central strategy is to equate the marginal benefits of debt (debt tax shield - DTS) to its marginal costs (cost of financial distress (COFD) including agency costs (AC) and bankruptcy costs (BRC)) to insure the lowest cost of capital and the highest value of the firm. This static tradeoff (STO) theory suggests the existence of an optimal capital structure (CS) that should be targeted by sound firms. In addition to this tradeoff, leverage is also a function of both firm-specific and macroeconomic variables. These variables have been presented in the numerous capital structure theories and empirically tested in both developed and developing countries. The results of these studies vary between conclusive results like those of Titman and Wessels (1988) and puzzling results like those of Myers (1984). At the end of the day, no

consensus has been reached.

The other widely tested capital structure theory is the Pecking Order Hypothesis. Myers and Majluf (1984) suggested that because of information asymmetry (between corporate insiders and the market) and to avoid any unwanted dissipation of information, firms use the least risky (the one that reveals the least information) financing sources, and they move up the ladder of financing sources within this information asymmetry guideline. Internal financing from retained earnings would be the first source, followed by debt, hybrid securities like convertibles, and as a last resort, external equity. In this hypothesis, financing stems from the need for new investments and from dividend and retained earnings policies; no targeted optimal capital structure is anticipated, and capital structure is simply a consequence of funding requirements.

The main difference between STO and POH is the existence of an optimal target CS. STO assumes that a firm's financing behavior is governed by a strategy that calls for a targeted debt ratio that optimally equates marginal DTS with COFD. POH assumes that any tradeoff efforts are second order and that no debt ratio is dominant. These theories have been tested extensively in the US, less in developed countries, and least in developing ones. None of these theories and their tests took into account institutional factors and country traditions. This is a weakness of capital structure theory that has not been given the deserved attention in finance literature.

The main goal of this dissertation is to empirically test capital structure theories in the Arab world. These tests will take into account the effect of Arab country traditions and institutional factors' on both the aggregate level of leverage and its determinants. Hypotheses based on STO and POH models and their applicability in the Arab world are developed and tested. To test these hypotheses, three to six year panel data from 461

listed companies (1115 company years) in 12 Arab countries are used. Due to the nature of the data, TOBIT model is used to regress six leverage ratios (short term, long term, and total book values of debt over both book and market values of equity) on empirical and theory-suggested determinants of capital structure. Tests are conducted both at the national and regional levels. The findings are compared to the findings of similar tests in both developed and developing countries in an attempt to test the robustness and applicability of capital structure theory in different environments. The preliminary expectation is that the degree of applicability of CS theory in the Arab world is low and depends on the extent to which the Arab economy shares features of the Western economy (tax system, capital markets, form of business, etc.). Formal testing of the POH model is not possible due to the fact that the data set that was available for this dissertation is short (3 – 6 years). However, indirect evidence will be provided by using summary statistics of financing patterns and their implications for POH. The evidence is discussed in a fair amount of detail.

This dissertation is unique in many respects: it is the first work that empirically tests CS theory in Arab countries. It is also one of the few studies to tackle these issues outside the US, much less in developing countries. It utilizes a unique database assembled by the author from several data sources. It tests capital structure theory and its applicability in environments different from those in Western economies. Finally, and of most significance, is the fact that this dissertation is the first work to test capital structure theory in countries that do not have tax regimes in place.

Of the 22 Arab countries, only the 12 countries that have stock markets will be studied: Saudi Arabia, Kuwait, Bahrain, Qatar, the United Arab Emirates, Oman, Morocco, Tunisia, Egypt, Jordan, Palestine and Lebanon. These countries are divided

into two main groups, the oil states (the first five) that do not levy taxes (non-tax countries, hereafter) and the remaining tax levying countries (tax countries, hereafter). This dissertation finds for tax models of capital structure, on the other hand it does not find for the other models. Specifically:

- 1- Tax models are supported by empirical evidence; hence, tax models of capital structure are robust and portable across countries regardless of country specific factors. The only requirement for tax models to work as theorized is the existence of a tax regime.
- 2- Agency and information asymmetry models are not supported by empirical evidence and need to be revised to cope with new environments.
- 3- The country of origin model of capital structure is supported by empirical evidence. Further theoretical and empirical research is warranted.
- 4- This work discusses other significant findings that affect debt determinants. These include: absence of debt markets, strong and well developed banking system, state sponsored stock markets, cultural and regional factors like the prohibition of interest rates in Islam, (the dominant religion in the Arab world), the dominance of family ownership, absence of corporate or personal taxes in oil rich countries and the urge to follow on the lead of western economies.
- 5- The main conclusion is that tax is the main driver of debt, and Arab countries' use of debt is in strong conformance with capital structure theory if tax is levied and do not conform at all when no applicable taxes are levied. Future developments in capital structure theory should venture into environments where taxes are not a factor in borrowing.

The rest of the dissertation is organized as follows. Chapter II contains a review

of literature relevant to the topic. Chapter III analyzes the Arab country traditions and institutional factors that are expected to affect capital structure decisions. Chapter IV presents the measures of capital structure, its determinants, and the expected effects of the Arab world country traditions and institutional factors on these determinants and develops the hypotheses. Chapter V describes both the data and the methodology used. Chapter VI enumerates empirical results. Chapter VII provides a brief summary and the contributions of this dissertation.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

In their efforts to understand the incentives for a firm to use debt, finance scholars put forward different theories and models. Each explains one or more of the determinants of capital structure. These theories cover the various aspects of the firm that can explain the use of debt. We have yet to see a comprehensive theory that covers all of these factors in one interconnected analysis. The most commonly found theories in capital structure are the following:

Tax Based Theories: Assume that an optimal capital structure involves balancing the tax advantage of debt against the present value of its costs, i.e. a Static Tradeoff framework. Leverage-related costs include bankruptcy costs, agency costs of debt, loss of non-debt tax shield and the personal tax disadvantage of debt. Due to the rare availability of data from countries that do not have a tax regime in place, tax-based theories will be discussed extensively in this dissertation.

The Agency Approach: Assumes that capital structure is determined as a result of the conflicts of interest among the various groups that have claims on the firm's resources. These groups include managers and equity and debt holders.

Asymmetric Information Approach: Explains the level of debt in a firm by the differences in the information available to the managers of the firm and to the capital

markets. Debt level is chosen to mitigate the adverse effects of external equity and capitalize on the advantages of internal financing, i.e. the Pecking Order Hypothesis framework.

Corporate Control Considerations: Use the fact that equity carries voting rights while debt does not; thus capital structure affects the outcome of takeover contests through its effect on the distribution of votes. Knowing that the market for corporate control is virtually nonexistent in the Arab world, corporate control theories will not be tackled in this dissertation.

Product / Input Market: Exploits the relationship between a firm's capital structure and its strategy when competing in the product market and the relationship between the firm's capital structure and the characteristics of its products or inputs. Harris and Raviv (1991) state that these models are new in the western economies and very little empirical work has been done to test them. Also, because of the limited competitive product and input markets and the limited data available, there is very little use in tackling these theories here.

Neutral Mutation: Miller (1977) and Myers (1984) state that capital structure choice is arbitrary and has no economic reasoning to it. In other words, it is just a financing pattern or a habit, which has no material effect on the value of the firm. This position can be considered a hypothesis of no theory of capital structure and will not be pursued here.

This chapter presents a thorough literature review over capital structure theory. Section 2.2 reviews tax based and non-tax based capital structure theories including agency costs based models and models using asymmetric information. Section 2.3 presents the relevant empirical work done in the area of capital structure and

financing behavior. The empirical work is classified into three broad categories: (1) empirical work from the US, (2) empirical evidence from other developed countries and (3) that conducted in developing countries.

2.2 Theoretical Literature

The theoretical literature related to capital structure (CS) in firms has focused on how firms choose their financing mix as part of their efforts to maximize their value. In this section some of the most important studies will be reviewed. From there, the focus will move to theoretical papers that have emphasized the determinants of corporate borrowing.

When reviewing the theoretical literature related to capital structure, one must always start with the celebrated paper of Miller and Modigliani (MM) (1958). Since then, many scholars have followed their path. MM's proposition I states that the cost of capital and hence the value of the firm (V) are unaffected by the firm's CS. This with their second proposition, which states that the rate of return on a stock increases as more debt is used, shows an inverse relationship between the value of the firm's equity (S) and the utilized level of debt (D). To illustrate, if the value of the firm $V = S + D = \text{constant}$ (proposition I) then any increase in the value of debt will be balanced out by a loss in the value of equity (proposition II). In other words, any gains from using more of what seems to be cheaper debt capital would be offset by the correspondingly higher cost of the now riskier equity capital. MM explained this inverse relationship between debt and equity by the increase in risk due to the increase in the use of debt. MM show this effect mathematically in equation 2.1, which demonstrates a positive (negative) relationship between the cost of equity (value of equity) and the use of debt.

$$i = \rho_k + (\rho_k - r) * \frac{D}{S} \quad (2.1)$$

where

i = the cost of the firm's equity,

ρ_k = the cost of equity for the firm class,

r = the cost of debt,

D = the value of the firm's debt, and

S = the value of the firm's equity.

MM (1958) propose the irrelevance of capital structure under the assumptions of perfect capital markets. Subsequent theoretical works focus on relaxing these assumptions and their effects on the relevance of capital structure.

2.2.1 Theoretical Literature Focusing on the Tax Effect on Capital Structure

The static trade-off theory of capital structure (STO) states that the trade-off between the tax advantage of debt and its costs is expected to yield the optimal level of leverage that maximizes the value of the firm. The first paper to extensively demonstrate this relationship was the Miller and Modigliani tax correction article (1963). By including taxes, MM demonstrated that the value of the firm increases by an amount equivalent to the debt tax shield (the corporate tax rate * interest paid on debt). Mathematically:

$$V^L = V^U + T_c * D \quad (2.2)$$

where

V^L = the value of the levered firm,

V^U = the value of the unlevered firm,

T_c = corporate tax rate, and

D = value of used debt.

This gives us the first factor to consider in our effort to find the driving factors of the firm's level of leverage. Modigliani (1988) summarizes the MM (1963) finding as the dollar of debt that will increase the value of the firm by $T_c \cdot 100$ cents. He also states that this result rests on the assumption that the tax savings stream $T_c \cdot D$ is constant, perpetual, and absolutely certain, like the coupon of a government bond. MM (1963) mentioned some limitations to the validity of the assumption, such as the possibility of changes in the tax code and of profits falling below contractual interest. However, the assumption that the choice of capital structure is permanently fixed seems untenable in a world in which the movement of expected profit and size of the firm is supposed to follow a random walk (or a martingale). MM ended their (1963) piece by noting that other factors -beside taxes- affect CS decisions. This note opened the way for other scholars to contribute to CS theory as we now know it.

Farrar and Selwyn (1967) introduced personal taxes to CS policy. They calculated the net after tax (both corporate and personal) earnings to the individual investor who uses personal debt to finance the purchase of the firm's equity as:

$$Y = [(EBIT - r \cdot D_c) \cdot (1 - T_c) - r \cdot D_p] \cdot (1 - T_p) \quad (2.3)$$

where

Y = net after tax earnings to the shareholder,

r = interest on debt,

D_p = personal debt,

D_c = corporate debt,

T_c = corporate tax rate, and

T_p = personal tax rate.

Taking the first partial derivative of Y with respect to D_p and D_c , as shown in equations 2.4 and 2.5,

$$\frac{\partial Y}{\partial D_p} = -r * (1 - T_p) \quad (2.4)$$

$$\frac{\partial Y}{\partial D_c} = -r * (1 - T_p) * (1 - T_c) \quad (2.5)$$

we find that $\delta Y / \delta D_c < \delta Y / \delta D_p$. In other words, corporate debt is cheaper than personal debt --regardless of the personal tax rate-- by a factor of $(1 - T_c)$. By including the personal income tax on capital gains, they found that what leverage adds to the investor's stream-of-returns net of both personal and corporate taxes can be written as:

$$Y = [(EBIT - r * D_c) * (1 - T_c) * (1 - T_g) - r * D_p] * (1 - T_p) \quad (2.6)$$

where

T_g = personal income tax rate on capital gains.

Again, taking the first partial derivatives we find:

$$\frac{\partial Y}{\partial D_p} = -r * (1 - T_p) \quad (2.7)$$

and

$$\frac{\partial Y}{\partial D_c} = -r * (1 - T_p) * (1 - T_c) * (1 - T_g) \quad (2.8)$$

In this case corporate debt is cheaper if $(1 - T_p) > (1 - T_c) * (1 - T_g)$. To clarify, if a dollar of profit is received as return on equity and we assume no dividends, then the tax that will be paid is first the corporate tax and then the capital gains tax, leaving $(1 - T_c) *$

$(1 - T_g)$. On the other hand, a dollar of interest will be taxed only at the personal level, leaving $(1 - T_p)$. They also write the tax advantage of debt as:

$$l = \frac{1 - (1 - T_c) * (1 - T_g)}{(1 - T_p)} \quad (2.9)$$

where

l = the tax advantage of debt.

When there are no personal taxes or when $T_p = T_g$, it can be seen that l reduces to MM's T_c because it makes no difference in what form corporate earnings are paid out – leverage is valuable only because it saves corporate income taxes. Farrar and Selwyn concluded: first, since personal tax on regular income is greater than that on capital gains, it is optimal for firms to use earnings to repurchase stock rather than pay cash dividends. They should use at least retained earnings to finance investments rather than paying cash dividends and using external financing. Second, since corporate debt dominates personal debt for investors, then, in a dividend-paying firm, it is optimal to use leverage. Third, in a non dividend-paying firm, corporate debt dominates personal debt for low-tax-bracket investors. The opposite is true for high-tax-bracket investors. The company's use of debt depends on its investors' tax bracket. These findings lie midway between those of the Pecking Order Hypothesis (POH) and those of Miller (1977), which we will see shortly.

Brennan (1970) criticized Farrar and Selwyn's work for two reasons. First, they assume that CS is chosen to maximize the investor's after-tax income instead of maximizing the market value of the firm. Second, their results are built on a comparative static model, which does not take into account the dynamic impact on the firm's value of issuing debt. Brennan concludes that the value of the firm increases as the firm takes on more debt because the corporate tax rate (T_c) is greater than the market-effective tax rate

(T):

$$T = \frac{(T_D - T_G)}{(1 - T_G)} \quad (2.10)$$

where

T = market effective tax rate,

T_d = personal tax rate on cash dividends, and

T_g = personal tax rate on capital gains.

Given that T is between zero and one, Brennan found that the first derivative of the value of the firm (V) with respect to debt (B) is:

$$\frac{\partial V}{\partial B} = \frac{(T_c - T)}{(1 - T)} \quad (2.11)$$

if we neglect personal taxes (T = 0) then dV/dB = T_c which is consistent with MM's conclusion in equation 2.2, which states that the value of the levered firm equals the value of the unlevered firm plus the value of the tax shield. In the same manner, he also concludes that if debt proceeds are to be used for dividends rather than stock repurchase, then the advantage of issuing debt is reduced.

Miller (1977) addresses taxes by assuming that the marginal tax rate (MTR) is equal to the statutory tax rate (STR) and concludes that whatever tax gains accrue from issuing debt at the corporate level will be exhausted at the personal tax level and that the value of the firm, in equilibrium, is still independent on its capital structure. In particular, under his assumptions, the joint corporate-personal tax gains from corporate leverage, G_L, can be expressed in the following relatively transparent formula:

$$G_L = \frac{\{1 - [(1 - T_c) * (1 - T_{PS})]\} * B_L}{(1 - T_{PB})} \quad (2.12)$$

where

G_L = the joint corporate-personal tax gains from corporate leverage,

B_L = the value of the levered firm's interest-deductible debts,

T_{ps} = the marginal investor's personal tax rate on income from corporate shares,

and

T_{pb} = the marginal investor's personal tax rate on income from interest-bearing corporate debts.

If markets are perfect (i.e. no taxes) then the gain from debt is equal to zero, and as MM (1958), indicated capital structure is irrelevant. In the special case where the two personal tax rates are equal, the gain from leverage reduces to $T_c * B_L$ -precisely the expression in the MM (1963) tax model. In the contrasting extreme case in which (a) the capital gains provisions or other special relief has effectively eliminated the personal tax on equity income, (b) full loss offsets are available at the corporate level and (c) the marginal personal tax rate on interest income just equals the marginal corporate rate, the purely tax gains from corporate leverage vanish entirely, as in Miller (1988). The gains from interest deductibility at the corporate level are exactly offset by the added burden of interest includability under the personal tax. These findings support the MM proposition I (the irrelevance of capital structure). When the marginal tax rate is lower than the statutory tax rate (which is usually the case because of the non debt tax shield (NDTS), NDTS is the amount of tax savings from depreciation, losses, and investment tax credit) then the corporate tax benefits will overwhelm the personal tax disadvantage as per DeAngelo and Masulis (1980). Without the offsetting effects of the personal tax code, the only factor limiting the expansion of firm debt would be the contracting costs implicit in bankruptcy (Ross 1988). Since the cost of bankruptcy seems relatively small (Warner 1977) in

comparison with the tax advantages of corporate debt, it is difficult to explain the relatively conservative debt policies of many corporations. Miller (1977) concluded as stated by Stiglitz (1988): “while the fact that debt payments are deductible under corporation tax might seem to give debt an advantage over equity, to find the real effect one needs to look at the total tax consequences – at the combined effects at the individual and corporate levels.”

DeAngelo and Masulis (1980) contend that Miller (1977) overlooked other factors like non-debt tax shields (NDTS), bankruptcy costs (Miller actually did not completely overlook it, he just dropped it from his theory based on Warner’s (1977) assertion that bankruptcy costs are negligible), and agency costs of leverage, among others. In building their model, DeAngelo and Masulis show that investors make their investing decisions by taking into account the difference in risk and tax treatment of bond and equity income; debt is less risky but taxed more heavily than equity. Mathematically, if $(1-T_{pd})$ is less (greater) than $(1-T_{pe})(1-T_c)$, then investors will demand equity (debt) over debt (equity); if equal, then they are indifferent. On the other hand, the borrower will add debt so long as no tax shield (DTS or NDTS) is lost. Each firm will have a unique interior optimum leverage which equates the present value of marginal net tax advantage of debt to the present value of expected marginal default costs, (i.e. bankruptcy costs $BRC = (1-T_{pd})(1-T_{pe})(1-T_c) \times \text{firms debt}$). DeAngelo and Masulis also emphasized the trade-off between DTS and NDTS and the positive relationship between T_c (not MTR) and the use of debt.

Myers (1984) summarizes the above research in a descriptive, mathematical and graphical way. He describes the static tradeoff model as the optimal debt ratio that can be determined by a tradeoff between the costs [Financial distress = $AC+BRC$] and the benefits [DTS] of borrowing. Figure 2.1 shows a graphical representation of the STO

theory. It suggests that a firm's target debt ratio is its optimal ratio. Due to the dynamic nature of the firm's assets (book and market values of E and D change continuously, and D/E keeps departing from its optimal level), firms need to adjust their CS to the optimal level. If these adjusting costs are small, then materially similar firms should have the same capital structures. On the other hand, if these costs are large, then firms tend to lag in adjusting to the optimal debt ratio. If the latter is true, then one cannot tell if firms are just lagging on reaching their targeted optimal level or if there is no targeted level. Also, since both firms and investors have different marginal tax rates (depending on non debt tax shields (NDTS) and personal tax brackets, respectively), then similar firms may have different targeted optimal debt ratios. We know that the marginal tax rate (MTR) is equal to zero when non-debt tax shield (NDTS) consumes all generated income and greater than zero when it does not. Also MTR equals the statutory tax rate (STR) when NDTS = 0. MM (1963) considered that

$$DTS = MTR * r * D \quad (2.13)$$

where

DTS = debt tax shield,

MTR = marginal tax rate, and

r = debt interest,

D = level of debt.

which means that $0 \leq DTS \leq STR * r * D$. After accounting for personal taxes, Miller (1977) considers that $DTS = 0$ and $MTR = STR$, but if $MTR < STR$ then the investor loses the difference, which is equal to $(MTR - STR) * r * D < 0$. DeAngelo and Masulis (1980) reached a more realistic compromise theory between the two above, assuming a range of personal taxes paid on interest received according to the different personal tax rates (PTR); PTR

may be greater, equal to, or lower than MTR. Depending on their personal marginal tax rates and the relationship to a firm's MTR, investors may benefit, break even, or lose when they invest in levered firms. The three arguments on debt and taxes are summarized in Figure 2.2, which plots the net tax gain from corporate borrowing against the expected realizable tax shield from a future deduction of one dollar of interest paid. The MM (1963) line shows that interest tax shields are 100% reaped at the MTR rate. The Miller (1977) line shows that the tax shield is 100% exhausted by personal taxes when $STR = MTR$, and when $MTR < STR$, there will be a loss because of the firm's use of debt. The DeAngelo and Masulis (1980) line shows a tradeoff between reduction in net gain from borrowing because of personal taxes and an increase in net gain due to deductibility of interest paid on debt.

2.2.2 Theoretical Literature Focusing on

Nontax-Driven Capital Structure theories

The fact that this dissertation is empirically testing the determinants of capital structure in general and that some of the surveyed countries have no relevant tax systems in place lends credence to non-tax theories of capital structure. Agency and information asymmetry models will be given special attention in the following two subsections.

2.2.2.1 Models Based on Agency Costs

A significant portion of research has been devoted to models in which capital structure is determined by agency costs, i.e. costs due to conflict of interest among the firm's stakeholders. Jensen and Meckling (1976) initiated the research in this by building on the earlier work of Fama and Miller (1972). Jensen and Meckling identified two types of conflicts. Conflicts between shareholders and managers arise because

managers hold less than 100% of the residual claim. Consequently, managers do not capture the entire gain from their profit enhancement activities, while they bear the entire cost of wealth maximizing activities. Hence, managers have the incentive to invest less effort in managing the firm's resources and may be able to transfer firm resources to their own personal benefit, e.g., by consuming more perquisites. Increasing the fraction of the firm's equity owned by the manager can mitigate such behavior. This can be accomplished in ways like direct purchase of the firm's stock by the manager, bonuses in the form of shares, stock options, or increasing the firm's debt while holding the manager's absolute investment in the firm constant. Grossman and Hart (1982) pointed out that if bankruptcy is costly for managers because they lose benefits of control or reputation, then debt can create an incentive for managers to work harder, consume fewer perquisites, and make better investment decisions. Jensen (1986) and Stulz (1990) add that since debt commits the firm to pay out cash, it reduces the amount of "free" cash available to managers to indulge themselves with perquisites and value decreasing investments. The optimal capital structure is determined by the trade off between debt-preventing investments in value decreasing projects and the costs associated with debt-preventing investments in value increasing projects.

The second type of agency conflict is the one between debt holders and equity holders, which arises because the debt contract gives the latter an incentive to invest suboptimally in risky projects. If these projects yield large returns, above the face value of debt, then equity holders capture most of the gain. If these projects fail, debt holders bear most of the consequences because of limited liability. As a result, equity holders may benefit from "going for broke," i.e. investing in high risk projects, even if they are value decreasing. This effect, generally called the "asset substitution effect," is an agency

cost of debt financing that can be weighed against the benefits of debt to obtain the optimal capital structure for the firm.

Myers (1977) points out that when firms are likely to go bankrupt in the near future, equity holders may have no incentive to contribute new capital, even for value-increasing projects. The reason is that while equity holders bear the entire cost of the investment, the debt holders may capture most of the returns. Thus, larger levels of debt may result in the rejection of more value-increasing projects. This result can be seen as a cost of debt, and the optimal strategy involves a tradeoff between the tax advantages of debt and this cost, not the probability of default. He also concludes that assets-in-place should be financed with more debt than growth opportunities and that the determinants of debt financing of assets-in-place include capital intensity, operating leverage, profitability, covenants and other indenture provisions that mitigate the probability of underinvesting that is caused by the hypothesis that wealth is transferred from equity holders to debt holders when the firm is highly levered.

Harris and Raviv (1990) contend that managers are inclined to continue the firm's current operations even if investors prefer liquidation of the firm. Debt mitigates this conflict by giving investors (bondholders in the existence of debt) the option to force liquidation if cash flows are poor. On the other hand, equity holders cannot enforce liquidation unless information is generated through a full investigation of the firm's prospects. The optimal capital structure in Harris and Raviv trades off improved liquidation decisions versus higher investigation costs. Table 2.1 compares and summarizes ATF CS models.

2.2.2.2 Models Based on Information Asymmetry

This approach in explaining capital structure uses private information that firm managers or insiders are assumed to possess about the characteristics of the firm's return stream or investment opportunities. Using this information asymmetry argument, two approaches have been developed in finance literature. Ross (1977) and Leland and Pyle (1977) assert that the firm's choice of capital structure signals to outside investors the information held by insiders. Myers and Majluf (1984) and Myers (1984) chose the approach that capital structure is designed to mitigate inefficiencies in the firm's investment decisions that are caused by information asymmetry.

Myers and Majluf (1984) demonstrate that if management has favorable inside information and acts in the best interest of the existing shareholders, then management will refuse to issue shares even if it means passing up positive NPV projects because the loss in existing stock price (due to the issuance of new stock) might outweigh the project's NPV. On the other hand, passing up positive NPV projects is contrary to wealth maximization. To get out of this trap, issuing debt is in order if internal resources are not sufficient to take on the positive NPV investment projects because they both (external debt and internal funds) are not information-revealing sources of funds and involve no undervaluation due to any information asymmetry. Empirical support for Myers and Majluf's arguments can be found in Dann and Mikkelsen (1984), who show that issuing stock to finance investments does in fact have a negative impact on share price, but issuing debt has no effect. Myers and Majluf (1984) also show that the value of the firm is inversely related to the riskiness of the financing source. Riskless debt (which is not applicable to firms) or slack (cash and marketable securities) have no adverse effect on the value of the firm, debt is less risky than hybrids (e.g. convertibles), and equity is the

riskiest of all. Accordingly, investments are to be financed in that order. This theory has grown to be called the pecking order hypothesis (POH) of Myers and Majluf. Three issues are in order here. First, since active shareholders can shuffle their portfolios according to their objectives, not according to the method of financing of the firm's investments, then financing is irrelevant. Second, managers pursue their own best interest in all situations, and they will take advantage of their superior information to serve self-interest, which also suggests that financing is irrelevant. Third, POH suggests that financing relies on asymmetry of information and the riskiness of the financing source, combined with available investment NPV, not on the tradeoff between marginal benefits and costs of debt; hence POH suggests no optimal targeted capital structure.

Myers (1984) states that firms adapt their dividend payout ratio to their investment opportunities. Though dividends are sticky, target payout ratios are only gradually adjusted to shifts in investment opportunities. Thus, sticky dividend policies, and unpredicted fluctuations in profitability, together with changes in investment opportunities may exhaust internally generated funds leading to an unavoidable situation where external financing becomes a necessity. External financing choices depend on the information available to management; if management has unfavorable information, then a security with any risk exposure will be overpriced and the firm should issue stocks or even warrants. On the other hand, if information is favorable, then the firm should issue guaranteed debt. Myers (1984) compares POH with STO and finds that neither is able to strongly explain capital structure policies, and a mix of both may lead to the optimal capital structure decision.

Signaling with debt is the other leg of the capital structure information asymmetry theory. Here, investment is fixed and capital structure serves as a signal of

private insider information. According to Ross (1977), managers benefit if the firm's securities are more highly valued by the market but are penalized if the firm goes bankrupt. Investors take higher debt levels as a signal of higher quality. Since lower quality firms have higher expected marginal bankruptcy costs for any debt level, managers of low quality firms do not imitate higher quality firms by issuing more debt. Ross (1977) finds that the firm value (or profitability) and the debt-equity ratio are positively related. Also, an increase in bankruptcy penalty will decrease both the debt level and the probability of bankruptcy. Thus the firm value, debt level, and bankruptcy probability are all positively related.

Leland and Pyle (1977) exploit managerial risk aversion to obtain a signaling equilibrium in which capital structure is determined. They find that an increase in the firm's leverage allows managers to retain a larger fraction of the equity. The larger equity share reduces managerial welfare due to risk aversion, but the decrease is smaller for managers of higher quality projects. Thus managers of higher quality firms can signal this fact by having more debt (and owning more equity), meaning that there is a positive correlation between value, equity ownership of insiders, and the firm's leverage.

2.2.2.3 Models Based on the Market for Corporate Control:

As mentioned in the introduction to this chapter, the models of corporate control are not expected to be of great significance in the Arab world, because of the absence of mergers and acquisitions markets. However, for the sake of completion, a brief review of the literature on these models is presented.

Models of corporate control explain the firm's choice of capital structure by exploiting the fact that common stock carries voting rights while debt does not. Harris

and Raviv (1988) show that capital structure affects the outcome of takeover contests through its effects on the distribution of votes, especially the fraction owned by the manager. Thus, capital structure affects the value of the firm and the probability of takeover. The manager's ownership share in the company has a great impact on the outcome of the takeover. The manager determines his optimal ownership by trading off capital gains on his stake against the loss of any personal benefits he derives from being in control. Since the manager's ownership is indirectly determined by the firm's capital structure, this trade off results in a theory of capital structure.

Stulz (1988) shows that the shareholders can affect the outcome of a takeover attempt by changing the manager's stake in the firm. Increasing the manager's ownership in the firm increases the premium paid by the targeting firm and reduces the probability of both the takeover and the shareholders' benefiting from this increased premium. Again, since the manager's ownership is determined by the firm's capital structure, there is a link between the firm's capital structure and the market for corporate control. In other words, the probability of a takeover is negatively related to the target's level of leverage while the takeover premium is positively related to it. The shareholders can increase the manager's voting rights by increasing his ownership in the firm through increasing the firm's debt/equity ratio. Thus, a tradeoff between the level of managerial ownership and the probability of getting a higher premium determines the firm's optimal capital structure.

These models explain the effects of leverage by the managerial ownership and on the probability of takeover and the increase in the premium paid by the acquiring firm. It follows that the firm's optimal level of leverage is the result of trading off the level of managerial ownership and the probability of increasing the takeover premium.

2.2.2.3 Models Based on Product / Input Market:

Again, the models based on the product/input market are of limited applicability to this dissertation because of the lack of supporting data. A brief literature review is presented to keep the integrity of this work. These models consider the relationship between the firm's capital structure, its strategy when competing in the product market, and the characteristics of its products or inputs. Brander and Lewis (1986) derive a mathematical relationship that shows a positive relationship between the level of output and the level of leverage in oligopoly firms. Maksimovic (1988) shows debt capacity as a function of characteristics specific to industry and firm. He shows that debt capacity increases with the elasticity of demand and decreases with the discount rate. Using Michael Porter's (1980) elements of competitive advantage, Titman (1984) shows that the cost imposed on customers when a producer goes out of business (bankrupt) is higher for unique and/or durable product companies, than for non-durable products or those made by more than one producer. This leads to the result that firms that produce unique products use less debt to avoid the possibility of going out of business. Using the same philosophy, Sarig (1992) argues that bondholders bear a large share of the costs of bargaining failures but get only a small share of the gains to successful bargaining. This implies that the greater the bargaining power and/or the market alternative of its suppliers, the more debt a firm should have. Thus, Sarig predicts that highly unionized firms and /or firms that employ workers with highly transferable skills will have more debt.

These models use firm- and industry-specific characteristics as determinants of capital structure. They trade off the firm's strengths or weaknesses in such characteristics against the probability of going bankrupt to determine the firm's optimal CS.

The theories surveyed in this section have identified a great many potential determinants of capital structure. Since the theories are, for the most part, complementary, the relative importance of these factors remains a largely unanswered empirical question. Since these theories have a wealth of different implications, it is not surprising that a theory may have more than one determinant in its context. Some of the determinants discussed in the literature are only empirical and have no theory to back them, as we will see in the next section of this chapter. Finally, Harris and Raviv (1990) provide a comprehensive and more complete review of the literature. Table 2.2 summarizes the various theories and their implications.

2.3 Empirical Literature

The purpose of this section of the literature review is to summarize the relevant empirical work done in the area of capital structure. Much of the empirical work has focused on the static tradeoff theory and some on testing the pecking order hypothesis. Friedman (1953) stated, “Theory is to be judged by its predictive power for the class of phenomenon that it is intended to explain. Only factual evidence can show whether it is right or wrong. The only test of validity of a hypothesis lies in the comparison of its prediction with experience.” In accordance with this assertion, this dissertation will focus on empirically testing the determinants suggested by theories of corporate capital structure. Because of the lack of “a long enough” time series, the pecking order hypothesis will not be tested. Consequently, this review of empirical literature will focus on the determinants of capital structure only.

As in the theoretical review, we will find rich literature in the empirical tests of the various models of capital structure theory. Some of these works have conflicting

results even though they are carried out on similar data, due to difficulties involved in measuring both leverage and the explanatory variables of interest. Some studies include short-term debt while others do not. Some use the book value of debt and divide it by the book value of equity while others divide by the market value of equity. With regard to the explanatory variables, proxies are often difficult to interpret. Harris and Raviv (1991) show that measuring growth opportunities as the ratio of market value of the firm to book value of assets may be misleading because while firms with large growth opportunities should have a large value for this ratio, other firms whose assets have appreciated significantly since purchase but which do not have large growth opportunities will also have large values for this ratio. In addition to measurement problems, there are the usual problems with interpreting statistical results. Finally, data problems and innovations in the estimation techniques employed are also expected to produce unexpectedly varying results. In what follows, the results are taken as reported without regard to any of these problems.

The determinants of capital structure that are suggested by both theory and empirical work fit into four categories. These are trends, event studies, firm/industry characteristics, and ownership and corporate control factors.

In trends, Mayers (1990) and Taggart (1985) record two general trends in financing behavior in developed countries. Mayers found that, with time, firms are relying more on internal financing and less on external sources. He also found that firms use more bank debt than market debt. Taggart reports secular trends in leverage using a variety of different measurements. He finds that leverage has increased steadily since WWII but that current levels of debt may not be higher than those of the prewar period.

In event studies, Harris and Raviv (1991) summarize other studies' findings as

follows: Common stock abnormal returns are negative when stock or convertible securities are issued and zero when straight preferred stocks and bonds are issued. Masulis (1980) and Dann (1981) found positive abnormal stock returns when stocks are repurchased. Marsh (1982) shows that firms follow market trends when issuing securities and are more likely to issue equity when the previous year's share return exceeds that of market indexes. Masulis (1980), in a string of pure capital structure change events, reports that common stock abnormal returns are positive when debt is issued in exchange for common and preferred stock or when preferred stock is issued in exchange for common stock and negative when common stock is issued in exchange for debt and preferred stock or when preferred stock is issued in exchange for debt. In other words, leverage-increasing (decreasing) exchanges of securities are accompanied by positive (negative) abnormal stock returns.

With regard to industry characteristics, Bradley, et al. (1984) found leverage to be low in drugs, cosmetics, publishing, electronics and food and moderate in petroleum exploration, construction, metalworking and chemicals. The firm specific characteristics shown to influence capital structure theory include taxes, profitability, growth, collateral, size, payout ratio, and ownership structure. These are shown in Table 2.3.

Regarding the ownership structure's effects on leverage, Bathala, et al. (1994) show that leverage is positively related to managerial ownership and negatively to institutional ownership. Harris and Raviv (1991) summarize corporate control considerations from various studies. They show that hostile bidders usually fail when target firms pursue capital restructuring; increases in leverage decrease the probability of takeover success. Also, higher free cash flows lead to a higher probability of going private and an increase in leverage. Finally, a higher concentration of ownership leads to

higher leverage to prevent dilution of ownership and to capitalize on the benefits of leverage, especially if information asymmetry is high.

Section 2.3.1 contains a summary of some of the well known empirical studies in the US. Section 2.3.2 focuses on empirical works in developed countries. Empirical work on firms in developing countries is presented in section 2.3.3.

2.3.1 Empirical Tests in the US

Due to the vast number of scholars and data resources, one finds that most empirical research has been conducted in the US. This dissertation is concerned with cross-sectional regressions to find what determines capital structure in the Arab world. Thus, the emphasis will be on cross sectional studies. The following is a review of the most prominent work in this regard.

It is logical to start with the fathers of capital structure theory: MM (1966) tested the MM (1958) propositions I and II using data from electric utility and oil companies to run a univariate regression of the cost of capital on the D/V ratio and the cost of equity on the D/E ratio and found evidence to support their two propositions.

Bradley, et al. (1984) built a comparative static model that incorporated personal taxation on equity and interest income, costs of financial distress (BRC and AC), business risk, and NDTs. Using comparative statics they found that the firm's optimal leverage is negatively related to financial distress, NDTs, firm size, and variability of earnings. Using cross sectional data from firms in 25 industries in the US, they found that the industry factor explains 54% of the variation in leverage. They also found that leverage is correlated negatively with volatility of earnings, R&D, and advertising expenditures and positively with NDTs. The last finding contradicts the traditional

substitutability argument between DTS and NDTs, which they explained by assuming that NDTs is an instrumental variable for debt collateral.

Titman and Wessels (1988) used factor analysis to mitigate the measurement problems encountered when working with proxy variables and to avoid linear regression problems. They regressed six different leverage ratios (long term debt (LTD), short term debt (STD) and convertible debt (CD) on both market value (MV) and book values (BV) of equity) on 9 groups of explanatory variables. They found that firms with unique or specialized products have relatively low debt and that smaller firms tend to use significantly larger amounts of STD than larger firms. They also found that none of the variables explain the use of convertible debt, and that growth, NDTs, volatility of earnings, and asset value are insignificant in all 6 models. Finally, they found that profitable firms use less debt.

Givoly, et al. (1992) tested the effect of the Tax Reform Act (TRA) of 1986 shock on change in leverage in US firms. They tested leverage around the enactment of the TRA (1984-1987) and found support for tax-based theories of CS, a substitution effect between DTS and NDTs, and that personal and corporate tax rates affect leverage. Specifically, the propensity of firms to decrease leverage as a result of a drop in the statutory tax rate is greater with a higher effective tax rate.

Bathala, et al. (1994) tested debt policy from the perspective of the manager-shareholder agency conflict. They used simultaneous equations to find the inter relationship between managerial ownership and the use of debt as agency-reducing mechanisms. They also studied the impact of institutional holdings. They found that the use of debt and managerial stock ownership are inversely related to institutional ownership in the firm. Additionally, they found that the debt ratio is inversely related to

managerial equity ownership, research and development expenses, and growth. These results are consistent with the view that high research and development and high growth firms are associated with greater agency costs, making debt the preferred medium for raising capital compared to external equity. They also found an inverse relationship between debt and earnings volatility, and a positive relationship with NDTS (depreciation).

Graham (1996) used MTR (the present value of current and future taxes paid on an additional dollar of income earned today) instead of just the average of past paid taxes as mistakenly used in Givoly, et al. (1992). He uses data on US firms to regress changes in debt on MTR, σ MTR, STR (the statutory tax rate) - MTR, personal tax rates, probability of bankruptcy, NDTS, and control variables. He found that the coefficient for MTR confirms a positive relationship between debt use and tax rates. A firm with $STR > (<) MTR$ will issue more (less) debt and firms with large σ MTR will have a large expected tax bill and therefore will issue more debt. He also found that relative taxation of debt and equity at the personal level has no effect on debt, and the probability of bankruptcy is insignificant. The results also confirm the substitution between NDTS and DTS.

Hovakimian, et al. (2001) found an inverse relationship between the firm's level of debt and its profitability, NDTS, growth, uniqueness, and selling expenses. They also found a positive relationship with both collateral and firm size. In testing the tradeoff theory of capital structure and the existence of an optimal level of debt, they found that debt ratios deviate from this suggested optimum level. The evidence shows that firms tend to accumulate past profits and losses in a manner that is consistent with the pecking order behavior. Their results suggest that although past profits are an important predictor

of observed debt ratios, firms often make financing and repurchase decisions that offset these earnings-driven changes in their capital structures. Finally, they found that capital structure considerations play a much more important role when firms repurchase rather than raise capital and that stock prices play an important role in determining a firm's financing choice. Firms that experience a large stock price increase are more likely to issue equity and raise debt than are firms that experience stock price declines. This observation is consistent with the idea that stock price increases are generally associated with improved growth opportunities, which would lower a firm's optimal debt ratio.

As seen above, empirical tests of capital structure in the US are diverse and comprehensive. They deal with all the aspects that have been considered by theory. Moreover, these studies even consider determinants of capital structure that have not been covered by theory; Table 2.3 shows some of these empirical determinants. There are many reasons for the comprehensiveness of these studies, some of which are the availability of data and the abundance and competitiveness of scholars in the field of finance. These studies, however, are all based in the US and therefore lack the benefit of insight one can get through inter country comparisons. They also lack consideration of country traditions and institutional factors as determinants of capital structure. The next subsection will shed some light on these factors.

2.3.2 Empirical Tests in Developed Countries

Empirical tests in developed countries are generally less numerous and follow the lead of those done in the US. Some tried to test country-specific determinants of capital structure and found them to be compelling, thus proving that theory is still not complete and needs revision.

Marsh (1982), using data from the UK found that a company's leverage is influenced by market conditions and historical security prices. Specifically, employing Probit/Logit models, Marsh found UK firms are more likely to issue debt (equity) when they expect other firms to issue debt (equity) and more likely to issue equity if the previous share return exceeds that of the risk-adjusted market portfolio. He also found that the probability of issuing debt and equity in the UK is a function of the deviation of CS from its targeted optimal level; firms are more likely to issue debt if their current long-term debt is below a target measured by the average debt level for the previous 10 years. When regressing leverage on various explanatory variables, he found that the proven target debt ratio is a function of firm size, bankruptcy risk, asset composition, and tax considerations.

Mayers (1989) calculated the weighted average net financing for non-financial enterprises between 1970 and 1985 in 8 developed countries and found that bank-based countries (countries that depend on banks for borrowing; continental Europe and Japan are examples) use more debt than market-based countries (these are the countries that depend more on debt markets for borrowing. The US, UK and Canada are examples, these are also known as Anglo Saxon countries). In both groups of countries, corporate growth is financed mainly from internal sources. He also found that the equities market is not an important source of finance for the non-financial corporations in any of these countries. As far as external finance is concerned, bank loans are the main source of external finance for all countries and this source is growing over time. Finally, determinants of capital structure and financing patterns are very similar among western economies.

Rajan and Zingales (1995) analyzed financing patterns and determinants of capital

structure of the largest non-financial companies in G-7 countries using 1984-1991 data. In an effort to test the robustness of capital structure models developed with US data, they found that all countries have approximately the same amount of leverage, but the UK and Germany appeared to have the lowest leverage. When examining external financing patterns (debt vs. equity) they also could not find any differences in financing patterns between market based and bank based G-7 countries. Significant determinants of leverage in the US were found to also be significant in other G-7 countries and with the same directions. Specifically, debt is negatively correlated with growth (the free cash flow agency cost of Jensen (1986)) and profitability (Myers 1984 POH; higher profitability means higher ability to finance investments from retained earnings) and positively correlated with tangible assets and size. In conclusion, the financing behavior and capital structure determinants and policy in G-7 countries seem to be homogeneous and consistent with POH, with only minimal differences between them.

Antoniou, et al. (2002) used panel data from Britain, France, and Germany. They explored whether a firm's country of origin has an effect on capital structure. They found that firms pursue a target debt ratio and that country of origin affects the speed at which they revert back to target levels, with France being the fastest. They state that Anglo-Saxon companies use lower leverage than companies in bank based economies. Furthermore, agency and indirect bankruptcy costs are known to be higher in Anglo-Saxon countries due to the lack of a long-term relationship between firms and creditors and long-term objectives of business management; management can not afford to be myopic when dealing with creditors as opposed to the known short term concerns with stock markets. Germany follows the Germanic tradition where corporate decisions and restructuring are made through the involvement of universal banks and financial

holdings. In addition, capital markets are not as effective as in the Anglo-Saxon tradition, and there are fewer listed companies. On the other hand, France is known to follow the Latinic tradition where corporate ownership structure can be characterized by family control, financial holdings, state ownership, and cross-shareholdings, and where agency problems are internalized. Much like this dissertation, this study sheds light on the role of these financial and institutional traditions (accounting and taxation systems, bankruptcy laws, corporate governance) on capital structure decisions. They find that leverage is inversely related to growth, interest rates, and stock prices, and positively related to firm size. They find mixed results (amongst countries) on profitability, tangible assets, marginal tax rates, dividend yields and equity premiums (cost of equity/ risk free rate). These mixed results show that institutional arrangements and country traditions contribute to capital structure decisions. French firms were found to pay low dividends and to have low debt. Family controlled firms pay fewer dividends, retain more earnings, and use less debt and public equity to maintain family control. Information asymmetry is high in the French family-owned firms and in market-dependent British firms; as a result Antoniou, et al. suggest that bondholders expect to be exploited. This expectation requires higher yields; consequently debt use is lower in these countries. In Germany, bank managers are usually on the corporate board, causing a strong relationship between banks and companies. Also, the long-term business relationship between banks and firms makes debt less expensive (lower bankruptcy costs and less important short term volatility) and debt use higher. For the same reason (German firms' reliance on bank loans), tangible assets show more significance in Germany than in the other two countries.

In summary these studies have the following attributes: First, they followed the

same methodologies as those in the US and arrived at similar results due to similarities between these economies and that of the US. Second, though they are less numerous than those conducted in the US, they extended the tests to include factors that were neglected in US studies, especially institutional inter-country differences. Finally, they opened new venues in capital structure theory and empirical testing. This is where empirical tests followed suit in developing countries.

2.3.3 Empirical Tests in Developing Countries

Notwithstanding the setback of the 1980s (i.e. debt crises, currency problems and crashes in stock markets) in Latin America and Africa, the developing countries have achieved an impressive degree of industrialization during the last four decades. Since the 1950s, these economies collectively have recorded high rates of industrial growth and an appreciable increase in their share of world manufacturing production. This phenomenon led to a large amount of literature on the various aspects of these countries' developments. However, the corporate financial structure and, more generally, the relationship among corporate organization, capital structure, and economic and industrial development has received very little attention. The chief reason for the paucity of studies on corporate finance in less developed countries has been the lack of suitable data on a standardized, comparative inter-company basis. However, with the recent emergence of stock markets in a number of developing countries, more information on company accounts has become available. Although these accounts are very far from being perfect in terms of either their quality or coverage, in view of the importance of the subject, they are sufficient for the purpose of the investigations to follow.

Singh and Hamid (1992) used data from 9 developing countries from various

locations around the world for the years 1980-1988. They found the following determinants of capital structure in developing countries: leverage is positively related to firm size and is negatively related to growth and profitability. Minor differences in the magnitudes and signs among countries are due to differences in tax, legal, and other institutional factors (accounting practices, degree of development of financial markets, etc.). No evidence was found to support any form of STO. They also found that firms in developing countries follow an exact reverse POH; this result holds for every country individually and for all the countries combined.

Singh (1995) extended the data in Singh and Hamid (1992) to include more firms and one more developing country. He found that external equity is the first source to finance asset growth. By contrast, developed countries use external equity to finance mergers; conglomerates in developing countries are built by firms instead of acquiring existing businesses. He also found that developing countries are not repeating the financial history of developed countries, a unique and different pattern has emerged. Finally, he found that the conclusions of Singh and Hamid were robust to the inclusion of the new data.

Booth, et al. (2001) assess whether capital structure theory is portable across countries with different institutional structures. Capital structure choices of firms in 10 developing countries were analyzed, and the evidence showed that these decisions are affected by the same variables as in developed countries. However, there are persistent differences across countries, indicating that specific country factors are at work. The findings suggest that although some of the insights from modern finance theory are portable across countries, much remains to be done to understand the impact of different institutional features on capital structure choices. Their analysis and regressions show

that macroeconomic variables have no significant effects on the use of debt. They also found that debt ratios are positively related to tangible assets and firm size, but negatively related to profitability, growth, tax rate and business risk. In addition, they found evidence to support POH, STO (opposite to Singh and Hamid (1992)) and ATF (Agency Theory Framework). They suggest that since these results are similar to those in developed countries, finance theory is portable across countries. This proposition contradicts other results in the study. They found that the firm's country of origin explains up to 43.3% of the variability in the total debt ratio, which means that country factors are at work. Since capital structure theory does not consider country factors, it is premature to conclude that capital structure theory is portable across countries. Further research on these factors is necessary before reaching such conclusion. Rajan and Zingales (1995) present a good example for such research.

In conclusion, we find that empirical studies, though numerous, have concentrated mostly on testing the determinants of capital structure within the various theory models and frameworks. The tests above found mixed results. Some support the theory while others negate it, leading us back to Myers' (1984) question: "How do firms choose their capital structure?" The answer remains, "We don't know." Table 2.4 summarizes the reviewed empirical findings.

Comparing different theories with corresponding empirical evidence, one can either find support for, lack of support for or the absence of empirical testing for a given theory. Table 2.5 matches the theories with the empirical findings. Some of the untested areas of the theory suggest recommendation for further work. The Harris and Raviv (1991) review of capital structure theories and empirical works concluded by finding that models that relate capital structure to asymmetric information have been investigated to

the point where diminishing returns have set in. It is unlikely that further effort in this area will lead to significant new insights. With regard to empirical work, Table 2.5 provides a list of theoretical predictions that have not been tested (more can be found in Harris and Raviv 1991). Of course, testing these theories is complicated by the *ceteris paribus* conditions each requires, the statistical problems that data may have, and the methodological differences in the testing process. Nevertheless, it is essential that empirical work specifically addresses which effects are important in various contexts.

This dissertation will empirically examine whether the models of capital structure work according to theory in an environment that is different from the one where the theory born. The initial motivation of this dissertation was the fact that capital structure theory has not been tested in the Arab world due to the scarcity of data. The relentless effort to build a reliable database for this purpose enhanced this motivation, especially due to the availability of data in countries that have no tax system (no personal or corporate income taxes). This dissertation is not merely another attempt to find whether STO works; it is a real and unique opportunity to lend support to the theory or just reject depending on how the determinants of capital borrowing react to country factors. Another motivation came from the increased use of leverage in the Arab world despite religious and cultural barriers that make debt and interest (usury) a taboo. What is the reason for this dramatic increase of debt? The sporadic literature about banking, ownership structure, and tax and bankruptcy laws suggest the following. First, the use of debt protects family ownership from dilution. Family owned enterprises are very popular in the Arab world. Second, Islamic banking practices blur the distinction between debt and equity returns. Third, tax laws can give incentives to borrow through the deductibility of interest (i.e. DTS) in some Arab countries. Fourth, most corporate debt is private debt.

Because banking is quite advanced in the Arab world, the credit worthiness of the borrowers is weighed accurately, and defaults are quite rare. Finally, the Arab business environment has lenient (either not very strong and clear or poorly enforced by the executive branches of the respective governments) bankruptcy laws towards corporations when defaulting on a debt. Other regional and country specific factors that affect the use of debt in the Arab world will be hypothesized, tested, and analyzed in this dissertation. Examples are government and family ownership, firm's country of origin and reputation, and institutional ownership that is needed to acquire bank loans.

Some of the determinants that are suggested by capital structure theory may not apply in the Arab world (e.g. uniqueness, which was suggested by Titman and Wessels (1988)) because of the absence of such concepts in the Arab world and due to the nonexistence of the proxy for them. For example, of the hundreds of financial statements that were analyzed in collecting the data, none exhibited any research and development expenses. Other determinants include profitability, the availability of collateral, interest tax savings, the riskiness of the firm, future prospects and policies like dividend payout will all be considered.

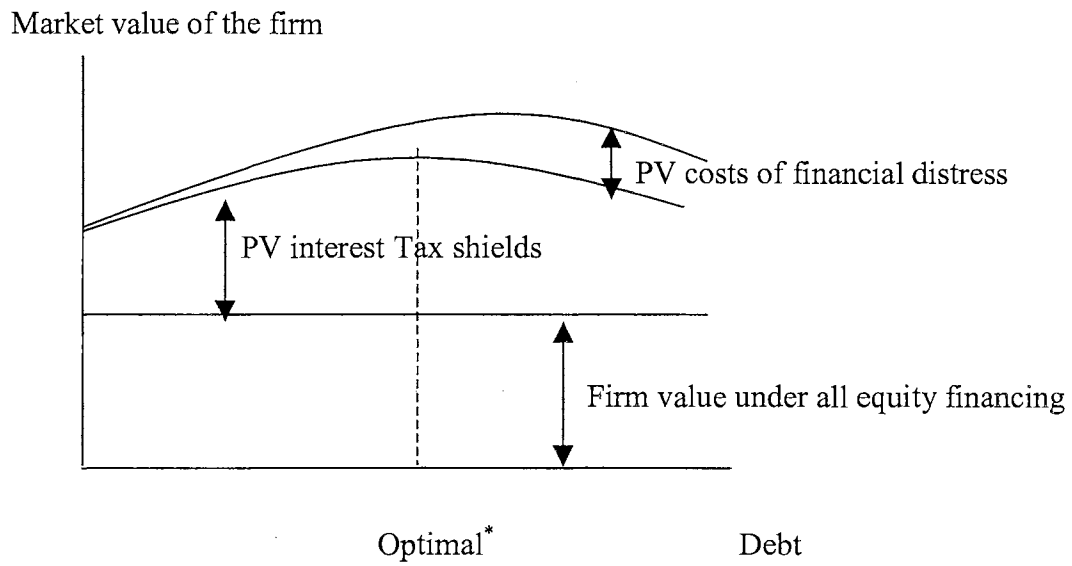


Figure 2.1: The static tradeoff theory of capital structure

Source: Stewart Myers, "The Capital Structure Puzzle," 1984.

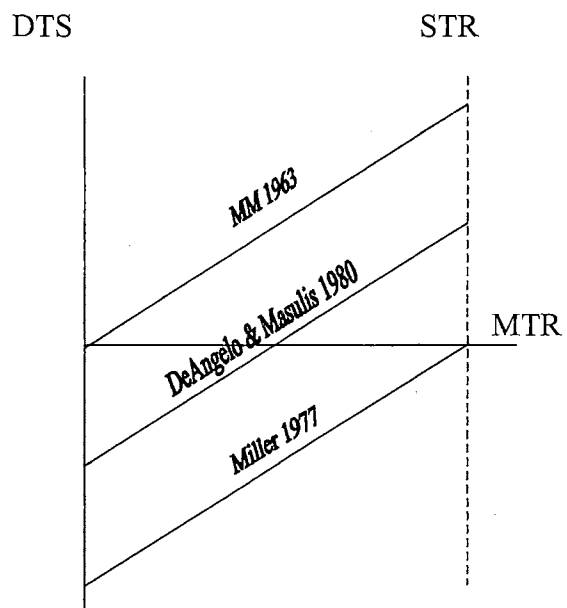


Figure 2.2 Comparison of debt MTR theories based on the net tax gain to corporate borrowing

Table 2.1

Comparison of Agency Models Based on Manager-Shareholder Conflict

Model	Conflict	Benefit of Debt	Cost of Debt
Jensen and Meckling (1976)	Managerial Perquisites	Increase managerial ownership	Asset substitution
Jensen (1986)	Over investment	Reduce free cash	Unspecified
Harris and Raviv (1990a)	Failure to liquidate	Allows investors option to liquidate	Investigation costs
Stulz (1990)	Over investment	Reduce free cash	Under investment

Source: Milton Harris and Artur Raviv, "The Theory of Capital Structure," 1991.

Table 2.2

Summary of the Theoretical Results

Leverage is related to:	Model	References
Corporate taxes	Tax	MM (1963)
Personal taxes	Tax	Farrar and Sylwin (1967), Brennan (1970), Miller (1977), DeAngelo and Masulis (1980)
Non-debt tax shields	Tax	DeAngelo and Masulis (1980)
Extent of information asymmetry	Asymmetric Info.	Myers & Majluf (1984)
Increases in profitability	Asymmetric Info.	Ross (1977), Leland & Pyle (1977)
Lack of growth opportunities	Agency	Jensen & Meckling (1976), Stulz (1990)
Increases in free cash flow	Agency	Jensen (1986), Stulz (1990)
Decreases in free cash flow	Asymmetric Info.	Myers & Majluf (1984)
Increases in liquidation value	Agency	Harris & Raviv (1990a)
Decreases in investigation costs	Agency	Harris & Raviv (1990a)
Firm Value	Agency	Harris & Raviv (1990a), Stulz (1990)
Default probability	Agency	Harris & Raviv (1990a)
The extent of managerial equity ownership	Asymmetric Info.	Ross (1977)
	Asymmetric Info.	Leland & Pyle (1977)
There is a Pecking order	Asymmetric Info.	Myers & Majluf (1984)
Firms issue equity when info. asymmetry is smallest	Asymmetric Info.	Myers & Majluf (1984)
Bonds are expected to have covenants prohibiting "asset substitution"	Agency	Jensen & Meckling (1976)

Table 2.3

Empirical Evidence Not Directly Related to Any Theoretical Results

Empirical results	Source
The extent of external finance has increased over time	Mayer (1989)
Total leverage has increased steadily since WW II	Taggart (1985)
Firms are more likely to issue debt if current debt level is below target	Marsh (1982)
Leverage decreases with return volatility	Bradley, et al. (1984), Friend & Lang (1988)
Leverage decreases with increases in firm size	Titman & Wessels (1988)
Leverage is associated with ownership structure	Bathala, et al. (1994)
Leverage increases with increases in operating risk	Kim & Sorensen (1986)**
Capital structure is used to protect control	Dann & DeAngelo (1988)**
Leverage decreases with increase in dispersion outside ownership	Friend & Lange (1988)

*= Weak or statistically insignificant relationship

**= Not reviewed in this dissertation

***= Reviewed but not presented in this dissertation

Table 2.4

Determinants of Leverage

The sign of the change in leverage as a result of an increase in the given characteristics is shown for each of the eleven studies. Blank entries indicate that the specific study did not include the given characteristic. The studies are Bradley, et al. (1984) [denoted BJK], Titman and Wessels (1988) [TW], Givoly, et al. (1992) [GHOS], Bathala, et al. (1994) [BMR], Graham (1996) [Gra.], Hovakimian, et al. (2001) [HOT], Marsh (1982) [Mar.], Singh and Hamid (1992) [SH], Rajan and Zingales (1995), [RZ], Booth, et al. (2001) [BADM], Antoniou, et al. (2002) [AGP]. Comparisons suffer from the fact that these studies used different measures of firm characteristics, different time periods, different leverage measures, and different methodologies.

Characteristic	BJK	TW	GHOS	BMR	Gra.	HOT	Mar.	SH	RZ	BADM	AGP
Volatility	-	-*	-	-							-*
Bankruptcy Probability	-		-		-*		-			-	
Collateral		+			+	+	+		+	+	+
NDTS	+	-*	-	+	-	-					
Advertising	-			-	+	+					
R&D	-			-	+	-					
Profitability		-			-	+		-	-	-	-
Growth		-*		-		-		-	-	-	-
Size		+	+		+	+	+	+	+	+	
Uniqueness		-				-					
MTR/Tax rate			+		+					-	
Managerial ownership				-							
Institutional ownership				-							

* Indicates that the result was either not significantly different from zero at conventional significance levels or that the result was weak in a non-statistical sense.

Table 2.5

Summary of Results by Model Type

The table shows, for each model type, the main results [with sources in brackets] and the empirical studies whose findings are either consistent (after the word “Yes”) or inconsistent (after “No”) with the theoretical results.

Theoretical results	Empirical evidence
<i>Panel A: Tax Models</i>	
The value of the firm increases with the increase in the level of debt [Miller & Modigliani (1963)]	Yes: Miller and & Modigliani (1966)
Leverage is positively related with the corporate tax rate [Miller & Modigliani (1963)]	Yes: Graham (1996)
Leverage is negatively correlated with personal tax rates	Yes: Booth, et al. (2001)
Leverage is negatively correlated with the non debt tax shield [DeAngelo & Masulis (1980)]	Yes: Titman & Wessels (1988)*, Givoly, et al. (1992), Graham (1996), Hovakimian, et al. (2001) No: Bradley, et al. (1984), Bathala, et al. (1994)
<i>Panel B: Agency Models</i>	
Stock price increases on announcement of debt issues, debt for equity exchanges, or stock repurchases and decreases on the announcement of equity issues or equity for debt exchanges [Harris & Raviv (1990a), Stulz (1990)]	Debt Issues
	Yes: Kim & Stulz (1988)**
	No: Dann & Mikkelson (1984), Ekbo (1986)***
	Debt for Equity exchanges
	Yes: Masulis (1980)
	Stock repurchases
	Yes: Masulis (1980)
	Equity Issues
	Yes: Masulis & Korwar (1986)**
	Equity for Debt exchanges
Leverage is positively correlated with firm value [Harris & Raviv (1990a), Stulz (1990)]	Yes: Masulis (1980), Ekbo (1986)***
	Yes: Bathala, et al. (1994), Graham (1996), Hovakimian, et al. (2001), Marsh (1982), Singh & Hamid (1992), Rajan & Zingales (1995)
Leverage is positively correlated with default probability [[Harris & Raviv (1990a)]	No: Titman & Wessels (1988)*
	No: Bradley, et al. (1984), Givoly, et al. (1992), Marsh (1982), Booth, et al. (2001)

Table 2.5 (Continued)

Leverage increases with lack of growth opportunities [Jensen & Meckling (1976), Stulz (1990)]	Yes: Titman & Wessels (1988), Bathala, et al. (1994), Hovakimian, et al. (2001), Singh & Hamid (1992), Rajan & Zingales (1995), Booth, et al. (2001), Antoniou, et al. (2002)
Leverage increases with decrease in profitability [Myers & Majluf (1984)]	Yes: Titman and Wessels (1988), Graham (1996), Singh and Hamid (1992), Rajan and Zingales (1995), Booth, et al. (2001) Antoniou, et al. (2002) No: Hovakimian, et al. (2001)
Leverage increases with extent of regulation [Jensen & Meckling (1976), Stulz (1990)]	Yes: Bradley, et al. (1984)
Leverage increases with increase in free cash flow [Jensen & Meckling (1976), Stulz (1990)]	No: Chaplinsky & Niehaus (1990)**
Leverage increases with increase in liquidation value [Harris & Raviv (1990a)]	Yes Bradley, et al. (1984), Friend & Lang (1988) No: Titman & Wessels (1988)*
Bonds can be expected to have covenants prohibiting "asset substitution" [Jensen & Meckling (1976)]	Yes: Smith & Warner (1979)**
Leverage is negatively correlated with the interest coverage ratio and the probability of reorganization following default [Harris & Raviv (1990a)]	Has not been tested
Leverage increases with the extent to which the firm is a takeover target or lack of anti takeover measures [Stulz (1990)]	Has not been tested
Leverage increases with the decrease in investigation costs [Harris & Raviv (1990a)]	Has not been tested
<i>Panel C: Asymmetric Information Models</i>	
Stock price increases on announcement of debt issues, debt for equity exchanges, or stock repurchases and decreases on announcement of equity for debt exchanges [Ross (1977)]	Debt Issues Yes: Kim & Stulz (1988)** No: Dann & Mikkelsen (1984), Ekbo (1986)*** Debt for Equity exchanges Yes: Masulis (1980) Stock repurchases Yes: Masulis (1980) Equity for Debt exchanges Yes: Masulis (1980), Ekbo (1986)*** Stock Repurchases Yes: Masulis (1980), Dann (1981)***

Table 2.5 (Continued)

Stock price is not affected by debt issues [Myers & Majluf (1984)]	See previous cell
Leverage increases with increase in profitability [Ross (1977), Leland & Pyle (1977)]	Yes: Long & Malitz (1985)** No: Titman & Wessels (1988), Friend & Lange (1988)
Leverage increases with decreases in free cash flow [Myers & Majluf (1984)]	Yes: Chaplinsky & Niehaus (1990)**
Stock price decreases on announcement of equity issue [Myers & Majluf (1984)]	Yes: Dann & Mikkelsen (1984), Masulis & Korwar (1986)***
There is a pecking order [Myers & Majluf (1984)]	Yes: Singh & Hamid (1992) No: Myers (1984)
Leverage is positively correlated with firm value [Ross (1977)]	Yes: Bathala, et al. (1994) No: Titman & Wessels (1988)*
Leverage is positively correlated with default probability [Ross (1977)]	No: Bradley, et al. (1984), Givoly, et al. (1992), Marsh (1982), Booth, et al. (2001)
Leverage is positively correlated with the extent of managerial equity ownership [Leland & Pyle (1977)]	No: Bathala, et al. (1994), Friend & Lang (1988)
Firms tend to issue equity after a price appreciation (Myers and Majluf (1984))	Yes: Marsh (1982), Antoniou, et al. (2002)
Firms tend to issue equity when price appreciation is smallest (Myers and Majluf (1984))	Yes: Korajczyk, et al. (1990a)**
Stock price decreases more the larger the information asymmetry (Myers and Majluf (1984))	Yes: Korajczyk, et al. (1990a)**
Leverage increases with the extent of information asymmetry (Myers and Majluf (1984))	

* = Weak or statistically insignificant relationship

** = Not reviewed in this dissertation

*** = Reviewed but not presented in this dissertation

CHAPTER III

COUNTRY TRADITIONS AND INSTITUTIONAL FACTORS

IN THE ARAB WORLD

3.1 Introduction

This dissertation will consider the 12 Arab countries that have stock markets: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Tunisia, Saudi Arabia and the United Arab Emirates (UAE). The Arab world regional factors to be discussed here are the tax system, legal system, capital markets, banking system, Arab culture and religion, and corporate governance. These factors differ slightly from one country to another, but the main theme is the same due to similarities in political, legal and regulatory, religious, and cultural factors. These similarities are due to the fact that Arab countries were one unified state that was divided into small monarchies by the colonizing west between the two world wars. One expected weakness of discussing these country traditions and institutional factors is the scantiness of literature that deals with these issues in the Arab world.

Though theory does not explicitly consider country traditions and institutional factors, it does include macroeconomic variables that can be seen as differentiating factors among countries. One variable in particular is the tax system, which includes differences in applying investment tax credit, losses, and taxes on interest, dividend income and capital gains. Nevertheless, capital structure theory does not address the

various country factors as determinants of firms' capital structures. These factors are expected to shed some light and give some answers to Myers (1984) questions. This dissertation's main theme is to empirically test capital structure theory in environments that have institutional factors and country traditions that differ from those in Western economies where capital structure theory was born and developed throughout the years.

It has been established that Arab countries are fairly homogeneous in their level of economic development (Abu Alrub and Barakat 2001). This chapter will present the institutional factors and country traditions that are likely to have an effect on financing decisions.

3.2 Tax Regimes in Arab countries

Tax laws in Arab countries were retrieved from the laws of the respective colonizing countries (Jordan, Egypt, Palestine, Saudi Arabia and the rest of the Gulf states were colonized by England, while Tunisia, Morocco and Lebanon were colonized by France) (Alsafarini 1988). These laws are usually well written, comprehensive and updated quite often. The most comprehensive is that of Jordan which was updated in 2000 (The Official Gazette 2000). Table 3.1 shows both corporate and personal tax rates for the Arab countries considered in this dissertation.

This subsection examines the effect of the tax code on aggregate leverage. The existing empirical literature on international capital structure differences claims that taxes have no explanatory power (Mayer 1990). However, as argued below, this conclusion may be unwarranted if personal taxes are considered in addition to corporate taxes. Rajan and Zingales (1995) state that whether taxes have explanatory power or not is highly sensitive to assumptions about the marginal investor's tax rate. For instance, there is no

tax advantage (as calculated by the Miller (1977) model) in the Arab countries that have no tax systems in place. Since $T_c = T_{ps} = T_{pb} = 0$, the tax advantage of debt $G_L = 0$. For a tax exempt investor in countries that have a tax system, the tax advantage is highest for the country that has highest corporate tax rate; $T_{ps} = T_{pb} = 0$ and $G_L = T_c * B_L$. As shown in Table 3.1, for the countries that levy both personal and corporate taxes, this tax advantage (for tax exempt investors) is highest for Egypt (40%, at the highest corporate tax rate) and lowest for Jordan (15%, at the lowest corporate tax rate). However, this conclusion is reversed if we consider an investor who is taxed at the top marginal tax rate in each of the two countries (-15 versus -9 percent).

Clearly, these two cases do not exhaust all the possibilities. The traditional investor wants to minimize his entire tax burden, not just the taxes levied by the central government. If local corporate and personal taxes are included, then the magnitude of the computed tax advantage of debt will change. The inclusion of the various taxes at the various tax brackets for both the corporate and personal levels will change the rankings of the countries in the sample. Because there are many tax brackets for the corporation and for individual investors, and due to the complexity of such calculations, they are not presented in this dissertation and will be left for further research.

In sum, the above discussion demonstrates the importance not only of including personal and corporate taxes in the computation of the tax advantage of debt, but also including the “right” personal taxes and the marginal tax rates of the corporation (MTR). Such a task is complex and does not serve the purposes of this dissertation.

Arab countries are divided into two groups: those, which have taxes (tax countries) and those that do not levy taxes (non-tax countries, usually Gulf States or oil-rich states). This division of the Arab world into two parts is very important because of

its implication for the determinants and level of leverage, as will be explained shortly.

Other factors being equal (like risk, bankruptcy, maturity, etc.), as far as the non-tax country corporations and investors are concerned, 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. However, for tax countries the story is much different. Unlike in western economies, dividends are either not taxed or taxed at a lower level than interest. For this reason, investors will require a comparatively higher return on debt to compensate them for the personal tax disadvantage, and this will eat up the corporate tax advantage of debt. To make matters worse, it is known in the Arab world that investors in corporate securities are the rich, or those in high tax brackets. The personal tax disadvantage, when combined with the higher return on equity to the investor (higher capital gains), will make debt more expensive to firms than equity. On the corporate level, unlike firms in non-tax countries, firms in tax countries enjoy the advantage of deducting paid interest from their taxable income (i.e. DTS). Consequently, tax countries are expected to use more debt than non-tax countries, *ceteris paribus*.

The above discussion has shown that one cannot easily dismiss the possibility that taxes influence aggregate corporate leverage in a country. In order to reach any conclusion on the effect of taxes on capital structure in a country, not only is it important to include personal and corporate taxes, it is also imperative to consider the effective tax rate (Rajan and Zingales 1995).

3.3 The Legal System in Arab Countries

Reading the corporate laws for each of the sample countries, one finds these laws

to be usually clear and compatible with those in other parts of the world. Just as in developed economies, limited liability corporations, partnerships and sole proprietorships are the main forms of business. This is also the case in other parts of the developing world. These laws define the form of business, the intra and inter relations among businesses and between businesses on one hand and society or government on the other. These laws also include bankruptcy and liquidation rules and procedures (Info Prod Research 1998).

According to Rajan and Zingales (1995), Harris and Raviv (1992) suggest that bankruptcy law should be regarded as an integral aspect of a debt contract. Arab countries are homogeneous in their bankruptcy procedures in both the extent of liquidation over renegotiation of claims and the management's control during the bankruptcy process.

Strict enforcement of creditors' rights enhances contractibility and gives creditors the right to penalize management and equity holders if the firm gets into financial distress, thus giving the management strong incentives to stay clear of it. Consequently, firms choose to use less debt when bankruptcy laws are strict and likely to be enforced. On the other hand, it may be of greater benefit to keep the firm as a going concern than to liquidate as per strict bankruptcy laws. Arab countries differ in the extent to which they manage this tradeoff. As shown in Table 3.2, countries that were colonized by Britain have bankruptcy laws that are friendlier to creditors (more strict to the firm) than the laws in those countries colonized by France. This is in accordance with the La Porta, et al. (1997, 1998) hypotheses of weak law (civil law/Roman) and strong law (Common law/Anglo Saxon) countries. This suggests that, *ceteris paribus*, the first would use less debt due to the strict bankruptcy laws and the latter would use more debt because of the

higher possibility of keeping the firm as a going concern than liquidation in the case of financial distress. Table 3.3 shows the average debt financing for the individual Arab countries and for the countries grouped as colonized. The numbers do not support our predictions for the following reasons:

- 1- Lebanon, Morocco and Tunisia do not have enough observations to reach any reliable results.
- 2- The very low market-to-book ratios in these countries exaggerate the debt to market ratios.
- 3- The fact that other factors affect the use of leverage like the strength of the religious influence. This effect is higher in Bahrain, Kuwait, Qatar and Saudi Arabia than in the more Westernized UAE and Egypt. Political and economic instability also drive down the use of leverage.
- 4- The level of law enforcement varies from country to country, the lowest being in Oman and Egypt and the highest in Kuwait and Jordan.

In sum, the Arab legal system gives mixed effects on the level of leverage because of the interactions among various factors. The main conclusion here is similar to that of Bhattacharya and Daouk (2002), who show that the enforcement of the laws has an effect, not just enacting them. After considering the Arab countries' legal strengths and weaknesses, one would expect less use of debt.

3.4 Arab Stock Markets

Empirical findings show that, at one end, stock markets have no effect on the firms' capital structure; Titman and Wessels (1988) found that the markets' reaction to a firm's growth is insignificant, which means that the market pays no attention to how this

growth is financed. Welch (2002) states that capital structure is determined primarily by external stock market influences, and not by internal corporate optimizing decisions. Others take a middle path; Antoniou, et al. (2002) found that among other factors of capital structure, like size, marginal tax rates, etc., debt is significantly inversely related to equity premium (equity premium is the cost of the firm's equity divided by the risk free rate) and the market price per share. Marsh (1982) shows that a firm's financing decisions are affected by the market prices of securities. Consequently, stock markets have a role to play in capital structure decisions.

The degree of development of stock markets influences financial decisions from stock splits, to dividends, to stock issuance and redemption, to capital structure. Moreover, stock markets are one of the major sources of funds in most financial systems. Using stocks for mergers and initial public offerings to finance the growth of going public and secondary public offerings for existing companies are examples of the importance of stock markets and their role in capital structure decisions (Singh 1995).

To show the degree of importance of the Arab capital markets in a firm's financial decisions, we will review and discuss Table 3.4, which shows a time series of statistics and ratios on Arab stock markets for the years 1997-2001. The number of companies listed in Arab capital markets is very small, as shown in Table 3.4. At the end of 2001, there were only 1757 companies were listed in all Arab stock markets, with Egypt having about 60% of these companies. It is also worth mentioning that only 659 of the Egyptian-listed companies are traded, and only 100 companies are actively traded (Arab Monetary Fund 2001). Of the listed companies, 39% are financial and do not serve the purposes of this dissertation. The number of listed firms grows about 15% annually. Comparing the number of listed companies in the Arab world with those in other emerging markets and

in developed ones, we find the following: 1,757 in the Arab world, 17,000 in emerging markets, and 20,000 in developed ones. Market capitalization as a percentage of GDP is 45% on average in Arab stock markets, which is higher than the 40% in developing countries and lower than the 55% in developed ones (Abu Alrub and Barakat 1999). However, it shows the importance of the stock markets in Arab economies. The trading volume to GDP ratio (average of 13%) is also very small compared to 51% in Hong Kong and 45% in Singapore. The trading volume to capitalization ratio averages 31% in the Arab world, quite low when compared to emerging and developed markets (55% in developed markets (Booth, et al. 2001)).

Further evidence of the importance of the Arab stock markets as a factor in firms' financial decisions can be extracted from their importance as a source of economic development in their respective countries. Table 3.5 shows the results of regressing the country GDP on stock market factors (e.g. number of companies (NUM), capitalization ratio (CAP) and the trading volume (TV)). We find that all of these factors are significant, meaning that stock markets play a significant and positive role in the country's development.

Arab stock markets are the main source of financing used by Arab firms. Table 3.6 shows external equity financing to be 70% of total financing, very high when compared to 40% in developing countries and 1% in the US. The following arguments may shed light on why equity financing is the first choice in the Arab world:

1. The local governments sponsor stock markets as a tool towards globalization and as a tool towards economic growth (Singh and Hamid 1992). As a sign of this support, data shows that state-owned companies are partially or totally listed in these markets (no space to show these data here).

2. The economic restructuring that most Arab countries are carrying out as part of the International Monetary Fund (IMF) and the World Bank (WB) requires privatizing government-owned companies. Privatizing leads to higher abnormal returns to investors since governments sell their shares at a discount.
3. Measures taken to improve the efficiency of Arab stock markets and attract foreign capital, the following are some:
 - a- Improving the laws and bylaws of the stock market that enhance transparency and prevent fraud.
 - b- Increasing the transparency and the informational efficiency of the market by requiring the issuance of periodical financial statements by the traded companies.
 - c- Creating tax breaks as a major incentive to invest in the stock market. As shown in Table 3.1, dividends are tax exempt or taxed at a lower level than interest income.
 - d- Increasing the foreign ownership to 49% in countries like Oman, Morocco, and Tunis and up to 100% in Jordan.
 - e- Joining the FIBV and FEAS, international bodies (unions or associations) of financial markets that have minimum requirements of efficiency (transparency, liquidity, depth, trading volume, capitalization, and ability to mobilize domestic resources and attract foreign capital) to join.
4. Creation and licensing of mutual funds. Such funds are also helping the development of these markets. New legislations have enhanced the integration between financial markets and institutions; 54.5% of the trading volume in Qatar for the year 2001 was either trades by banks or bank traded stocks (Alraya 2002).

5. Privatizing exchanges. Such exchanges are another tool to develop these markets by increasing the trading volume and generating profits to the private owners.
6. Avoiding public debt. As shown in Table 3.7 the corporate bond market is fairly new, small, and very illiquid (no secondary bond market). The AMF joint report shows that the size of the corporate bonds in the Arab world was no more than \$5 billion as of the year 2001, three billion of which were issued in Europe and two billion in the respective countries of the issuing companies.
7. Rising demand for stocks in the Arab world because of the high return (mostly capital gain) and the lower interest rates on treasury securities and consequently on bank deposits. The return on Arab stock markets has averaged 10% for the past 5 years (AMF 2002).
8. Falling cost of equity capital. Costs dropped dramatically in the 1990s in the Arab world because of the sharp rise in stock prices. Also, because of the debt crises in the Arab world in the same era, debt financing became more expensive (Lebanese Ministry of Information 1997).

In summary, despite the weakness of the stock market infrastructure in the Arab world, stocks are still the first choice of financing. Companies capitalize on the fact that these markets are bullish (i.e. stocks are overvalued) by using more equity than debt. Table 3.6 supports this result by showing a financing pattern of 70% for external equity, 16% for debt and 15% for retained earnings, which compares to 1, 13 and 86% in the US and 40, 22 and 39% in developing countries respectively.

3.5 The Banking System in the Arab World

Rajan (1992) argues that while informed banks make flexible financial decisions

which prevent a firm's projects from going awry, the cost of this credit is that banks have bargaining power over the firm's profits, once projects have begun. A tradeoff between these costs and benefits determines the optimal amount of bank debt, and consequently that of arm's-length debt. Rajan also quotes the results of other studies that show that banks reduce the agency costs associated with lending in various ways. First, they provide the firm with the incentive to make the right investments through screening prospective clients and threatening to cut off credit. Second, the bank has the capacity to provide cheap 'informed' funds as opposed to costly 'uninformed' or arm's length funds. Finally, a positive loan renewal signal implies that other agents with fixed pay-off claims need not undertake a similar costly evaluation. Information about the firm and its projects, which firms cannot easily communicate to others, is channeled from the firm to the bank in the course of acquiring a loan. On the other hand, a typical arm's length creditor like the bondholder receives only public information. It is hard to contact these dispersed holders, and any renegotiation suffers from the high cost and low ability to communicate information. Banks lend money to firms to carry out only positive (low risk) NPV projects. The firm has to share some of the surplus from the project with the bank in order to persuade it to continue lending. This sharing of the project's profits encourages the firm to run the project sub optimally. Consequently, the firm may prefer arm's-length sources, which exhibits neither the benefits of the bank debt nor its costs. Again, weighing these costs and benefits helps firms decide the portion of debt from banks and that from arm's-length sources. Casasola and Gine (2002) found a positive relationship between the issuing of market debt and the reduction in the firm's banking cost because issuing market debt is a positive sign of the financial health of the issuing firm, and it increases the issuing firm's bargaining power with the bank.

This section discusses the characteristics of both the banking system (Islamic and conventional) and the corporate bond market in the Arab world, their interactions and their effects on corporate financing decisions.

3.5.1 Islamic Banking System in the Arab World:

Due to the Islamic code of ethics, there has been a strong resistance to interest-based finance. This resentment stems from the prohibition of interest rates in Islam. The 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.... O you who believe, fear Allah and give up what remains 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]. For this reason and to fill the no-interest gap, there is a need for an alternative to a conventional interest-based economy in general and to conventional banking and financial instruments in particular. No-interest Islamic finance and Islamic banking is the alternative.

To promote Islamic finance and to establish an alternative to conventional banking, the concept of an "Islamic bank" was born at the Islamic Summit of Lahore in 1974, which recommended the creation of an Islamic Development Bank. At the end of

1998, the total amount of deposits in the 200 existing Islamic banks was evaluated at \$200 billion US. The importance of these banks is growing, and they have rapidly developed in the Muslim world where they account for more than 10% of total bank deposits. In terms of domestic market penetration, the most successful so far is the "Kuwait Finance House," which accounts for one-fifth of total bank deposits in Kuwait. Like the Islamic banks, Islamic management of equity funds is developing rapidly. While some 25 of these funds currently exist, there were only 5 in 1996. The total value of these funds is estimated between \$1 and \$3 billion US. The consequence of this growing interest from Muslim investors, the first global Islamic stock index, the "Socially Aware Muslim Index" (SAMI), was launched in November 1998. It tracks stocks of 399 companies in which investment can be placed under Sharia law (the Islamic law). A second Islamic index, the "Dow Jones Islamic Market" (DJIM) was launched in February 1999 (MEDEA 2000).

The underlying principle of Islamic banks and other Islamic financial institutions can be summarized as follows: there can be no *riba* (interest) charged on any transaction or service, as interest is considered usury and is condemned by the Quran. Interest is replaced by a share-out key determined beforehand for a share of risks and profits among the borrower, the bank, and the productive capital. Islamic banks submit all new types of transactions to a "Sharia (Islamic law) committee" in order to check their conformity with Islamic principles. It must be said that these Sharia committees have become more and more flexible in their definition of what is acceptable for Islamic banking. *Riba* is prohibited on the principle of no pain no gain. Islamic banking is very similar to venture capital finance or ordinary equity investment. The investor takes a share of the profits, if any, of the venture and is liable to lose his capital. This concept is changing in Islamic

law, and what was considered Halal (acceptable) in the past may have recently changed to haram (prohibited). Such change depends on the nature of the innovation and the sharia perception of it. Just as in the process of converting interest into capital gains for tax purposes, early Islamic investors were content to enter into zero-coupon bonds or discounted Treasury bills and receive the interest foregone in the form of capital gains. Recently such practices have been tabooed by sharia. Another example would be to invest in a low-interest-rate currency or even gold from the bank and then place it in an interest-free deposit account. At the same time the currency or gold is sold forward. But the forward rate is adjusted to reflect the fact that no interest is paid on the deposit account. Such locked-in and predetermined capital gains is in most fiscal jurisdictions now regarded as interest for tax purposes rather than capital gains, which is either free of tax or favorably taxed. Similarly such devices for converting Riba to capital gains is, in the most blatant forms, increasingly unacceptable to the Islamic sharia (Siddiqi 1983).

Nevertheless, 95 per cent of Islamic banking as practiced involves some form of pre-determination of profit or "mark-up" which is acceptable to Sharia since it is regarded as capital gains (Edwards 2000). This is the essence of the claim that such transactions are recorded as debt in firms' financial statements. The mark-up can be considered as interest that is deductible in the Arab tax countries. Most of the Islamic banking transactions take place in non-tax countries. And most of these transactions are at the individual level. Al Ahli bank of Saudi Arabia reported in 2002 that 95% of their business was done with individuals to buy durable goods. The remaining 5% was in the form of long and short-term loans to small businesses. The companies in this dissertation's sample are the largest in the respective countries. This means that these companies' debt is interest-bearing and should not be affected by the Islamic banking no-

interest debt. Finally, even for those firms that may have Islamic debt, Edwards' argument above shows that the predetermined mark-up is in lieu of interest and the loan can be considered a form of interest bearing debt. As mentioned elsewhere in this dissertation, the reader finds out that Islamic banking, as being conducted in the Islamic world, is just another form of interest lending that is wrapped in the form of capital gains. Again, this is in no way a claim that the Islamic system does not work; it is, on the other hand, a claim that Islamic banks do not conform to Islamic teachings in this regard.

Just as there is no central, global fiscal authority, there is no Islam-wide authority that determines what is Halal (Permitted) and what is Haram (prohibited). There is a danger that some banks will go "opinion-hunting" to get Islamic approval for their schemes. One can not deduce that this is corruption since the same process happens in the form of "opinion-shopping" by banks with the Big-five accounting bodies or with various tax counsels on interest-bearing structured finance schemes. Such a process is natural or just inevitable. Furthermore, just as Western banking business moves from one tax jurisdiction to another, so do Islamic banks that seek approval for various schemes from more lenient authorities. It is known that Saudi Islamic authorities occupy the far right and Malaysian ones at the more liberal left (Afaneh 2001). The point of this argument is that Islamic banking and its instruments are not clearly set as acceptable or not in the context of the no-interest principle. For example, derivatives, on one hand, are considered as speculative interest-bearing instruments that contradict the Islamic code, on the other hand, they are considered as acceptable hedging techniques that promote security and efficiency.

To establish the link between capital structure decisions and Islamic banking, the following is a brief description of the main Islamic financial instruments:

1- Mudaraba:

Under the principle of no pain no gain, no one is entitled to any addition to the principal sum if he/she does not share in the risks involved. The capital provider (e.g. Islamic bank) or rabbulmal may invest through an entrepreneur borrower or Mudarib. Profits are shared on a previously agreed-on basis but losses, if any, are wholly suffered by rabbulmal. This financing structure is called Mudaraba and looks like no recourse project finance. Mudaraba is also called Shirka.

2- Musharaka:

Financing through equity participation is called Musharaka. Here the partners or shareholders use their capital through a joint venture, Limited Partnership to generate a profit. Profits or losses are split between the shareholders according to some agreed-on pre-formula depending on the investment ratio.

3- Murabaha

In a Murabaha transaction, rabbulmal finances the purchase of an asset by buying it on behalf of its client. Rubbulmal then adds a mark-up in its sale price to its client who pays for it on a deferred basis. The 'cost-plus' nature of Murabaha sounds very much like the interest into capital gains manipulations of tax-avoiders.

Rubbulmal is supposed to take a genuine commercial risk between the purchase of the asset from the seller and the sale of the asset to the person requiring the goods. Rubbulmal stands between the buyer and the supplier and is liable if anything goes wrong. There is thus some form of guarantee with respect to the quality of the goods provided by the bank to the end user in the strict form of Murabaha. Title to the goods financed may pass to the bank's client at the outset or on deferred payment. Rubbulmal may be left without a buyer of the asset because the client has the right to shop for a

better deal during the period between the initiation of the contract and delivery of the asset. For this privilege the client pays what is called Arboun. Arboun can be seen as a call option premium if it is not redeemable. However, usually if the client chooses not to buy the asset (lets the call expire) from Rubbulmal then the Arboun belongs to the last. The difference here is that when the client decides to exercise the call (buy the underlying asset) then the Arboun is considered as an advance towards the payment for the asset.

4- Baimuajjal

It is deemed acceptable to charge higher prices for deferred payments. Such transactions are regarded as trades and not loans. Property financing on such a deferred payment basis is called Baimuajjal.

5- Ijara

An Islamic form of leasing is called Ijara. Here Rubbulmal buys machinery or other equipment and leases it out under installment plans to end-users. As in Western leasing, there may be an option to buy the goods built into the contracts. The installments consist of rental for use and part-payment.

6- Baisalam

A manufacturer seeks Baisalam when he/she seeks to finance the production of goods he is financing. This involves the Rubbulmal paying for the producer's goods at a discount before they are delivered or even produced. It is thus similar to the Bankers' Acceptance financing in the West.

7- Baimustaqbal

This is exactly like a forward contract that specifies the forward price, future delivery date, underlying asset, and all other provisions of a forward contract. These contracts are used in Malaysia more than any other country.

8- Islamic Derivatives

As mentioned earlier some Moslem scholars view derivatives as acceptable hedging techniques that promote security and efficiency. In general, a derivative is a financial instrument that is derived from another financial instrument or a combination of such instruments. Some Moslem scholars argue that as derivatives involve interest or interest-based products, they are contaminated and should be prohibited. However, derivatives only involve interest if one or both parties using the derivative seek to hedge the derivative. It could be argued that Murabaha could involve interest if the parties seek to match the interest-free but guaranteed-return product with an interest-bearing equivalent. Islamic banking derivatives should be perfectly acceptable so long as they do not involve interest.

Baisalam, which involves the pre-payment for goods, is indeed an Islamic banking derivative and can be regarded as a kind of forward contract. One would argue that the acceptability of a derivative boils down to intentions. Alcohol is prohibited under Islam. But alcohol is used for purposes other than the islamically-prohibited source of pleasure. In the same sense wheat futures can be used as a gambling tool. But wheat or oil futures as used by farmers or oil producers can help them manage their businesses and iron out economic cycles. Options are but insurance policies. Just as Takaful is an acceptable Islamic form of insurance (conventional insurance policies are prohibited in Islam), options for delivery of commodities by a producer of such a commodity should be acceptable (Edwards 2000). So also should options or forward contracts on any of the Islamic financial instruments mentioned.

These instruments are defined in the same way in more than one source, some of which are Ahmed, et al. (1983) and Siddiqi (1983).

As the instruments may suggest, their key features are the following:

- 1- They are free of interest
- 2- They are trade related and there is a perceived "genuine" need for the funds.
- 3- In their purest form, they are equity related
- 4- They are meant to avoid exploitation – no usury
- 5- The investments are ethical (no investment in harmful or prohibited assets and goods).
- 6- There are retail and wholesale applications.

(Siddiqi 1983)

The discussion of this issue has been lengthy; nevertheless, it has been necessary to serve the purposes of this dissertation. One can sum up the above discussion as follows. First, Islamic banking as conducted is just another form of interest-based banking. Second, for the purposes of capital structure, all Islamic lending is considered as debt. Third, the analyses above do not claim any weakness in the Islamic system.

3.5.2 Conventional Banking System in the Arab World:

The conventional banking system in the Arab world is quite advanced and capable of assuming its role in furnishing the loans needed to fulfill the debt requirements of Arab public enterprises (Arab bank publications 2002). Following are the reasons for such a claim:

1. The existence of the Islamic banking system added value to banking in the Arab world. Islamic banks play an integral role in the economy since they offer an alternative to those who want no dealings with conventional banks due to religious and cultural beliefs.

2. Arab countries improved the regulations and other legal infrastructure in their economic reforms mandated by their relations with the IMF and WB. Liberation of exchange rates and interest rates with the deregulation of financial institutions, especially banks, is one of the measures that helped Arab banking to prosper in the 90's (The Joint Arab Report 2001).
3. The Arab banking system is highly regulated and quite advanced due to partnerships with many American and European banks (Price Waterhouse 1990).
4. Banks are both allowed to underwrite corporate securities and to own equity in all kinds of companies.
5. The data in Table 3.8 shows that the Arab banking system is quite developed in the context of the development of the Arab economies; there is one bank per 27,000 residents in all 22 Arab countries and one per 9500 in the 12 countries studied in this dissertation. For comparison, the US has one bank per 12,000 persons (Shoult 1999).
6. The terms under which banks provide companies with short-term loans are very similar to those in the US and other parts of the world. Reputation is the leading term and the five C's of lending are as applicable in the Arab world as they are anywhere in developed countries (Price Waterhouse 1990).
- 1- Long-term loans are a different story; the reasons for this difference are the weakness of the bond market (see table 3.7), the monopoly of long-term lending, government regulations, and the imperfect relationship between banks and stock markets in some of the Arab countries. Long-term loan requirements are as follows (Arab bank publications 2002):
 - a. Partial financing of the projects by the firm.

- b. Enough tangible assets to cover at least 100% of the value of the loan.
- c. Comprehensive studies of the feasibility of the project showing scenarios of cash flows and their sensitivities to various factors.
- d. The history of the firm, including but not limited to sales, other loans, tangible assets, past and expected future growth, profitability, volatility and the amount of fixed costs the firm usually faces.

Arab banks' ability to both underwrite corporate securities and to own equity adds to their importance in corporate financing decisions. Another measure of the importance of the banking sector in financing firms is the ratio of private sector bank loans to gross domestic product (GDP). Table 3.9 shows that the banking sector is more important than corporate bond markets in all Arab countries and more important than stock markets in 7 of the 12 sample countries.

3.5.2 The Bond Markets in the Arab World:

Among all interest-bearing instruments, bond lending and borrowing is resented most in the Arab world. The interest is more obvious in bonds than in conventional banking and much more than that in Islamic banking. Bond income is taxable at the personal level while dividends are either not taxable or taxed at a much lower rate. Bonds are not liquid due to the nonexistence of secondary bond markets while stocks are liquid. Unlike stocks, bonds are not known to appreciate in price; most bonds are held until maturity and have no known market value (AMF 2001). For the reasons mentioned earlier, firms prefer bank debt.

Table 3.7 shows that bond financing in the Arab world is minimal compared to stock financing (US\$5 billion compared with \$86 billion). As argued above, bond markets are thin in the primary and nonexistent in the secondary market. This makes bank loans the main debt-financing instrument. Moreover, Table 3.7 shows that debt financing covers 21% of the total growth in Arab firms for the years 1996-2001 (i.e. \$17 billion, of which only \$5 billion is in bonds).

In light of this evidence, the Arab economies prefer informed debt to arm's length debt. The reasons are first, that banks are usually holders of the borrowing firm's stock and give loans with better terms and conditions. Second, the long term relationship between banks (unlike the short term and myopic relationship with shareholders) enhances the performance of the firms and lowers bankruptcy costs and risks; due to this relationship, banks are willing to renegotiate loans and would be less strict in suing the firm (Antoniou, et al. 2002). A third reason is the benefit of informed debt over uninformed debt in preventing bankruptcy. Finally, the bank's presence on boards of directors, combined with both equity and debt-holding minimizes both manager-shareholder and bondholder-shareholder agency conflicts and costs.

Nonetheless, the strength of the banking systems in the Arab world and the fairly strong reliance on stock markets make it hard to classify the Arab economies as market-based or bank-based systems. Rajan and Zingales (1995) did not find any systematic differences between the levels of leverage in bank-oriented and market-oriented countries. This suggests that differences in the importance of the banking sector have no effect on the firm's financing decisions. Moreover, this finding diminishes the importance of classifying the Arab countries as mentioned above. On the other hand, there are factors in the Arab world that give banks important roles in capital structure

decisions and in the choice between public (stocks and bonds) and private (bank loans) financing. The above discussion indicates that Arab banks are capable of supplying Arab firms with the needed funds, that bank debt dominates market debt, and that the lack of use of debt cannot be blamed on any weakness on the part of the Arab banking system.

3.6 Ownership and Control

Harris and Raviv (1991) have an excellent review of capital structure theories that are driven by corporate control considerations. As mentioned earlier, these theories were not reviewed at length because of the limited applicability to the subject matter of this dissertation. These theories exploit the fact that common stock carries voting rights while debt does not. These theories imply that capital structure affects the outcome of takeover contests through its effect on the distribution of votes, especially the fraction owned by management. Harris and Raviv (1991) conclude that takeover targets will increase their debt levels, and this increase will be accompanied by a positive stock price reaction. Second, leverage is inversely related to the success of the tender offer. Third, targets of successful tender offers have more debt than targets of proxy fights. Rajan and Zingales (1995) suggest that the active takeover market substitutes for the control over management.

The market for corporate control has no effect on the level of leverage in Arab firms for four main reasons:

- 1- Conforming to Singh and Hamid (1992), takeovers are almost unheard of in developing countries; the Arab world is no exception. Swabini (2001) states that acquisitions in the world increased from \$373 billion in 1991 to \$3500 billion in 2000, compared to \$ 6 billion in the last five years in the Arab world. These

acquisitions were in the banking system mostly, and in Lebanon and Saudi Arabia only.

- 2- Because of the concentrated ownership (to be discussed shortly) in Arab firms, hostile acquisitions are almost unheard of. Singh (1995) noted that in developing countries, firms issue shares to finance new investments rather than to acquire existing corporations and their assets. Family ownership runs to about 95% in the Arab world (Altowaijari 2002). The firms that are partially owned by the government and/or institutions are managed by the families that own the majority of the remaining shares (Swabini 2001).
- 3- El-Sherif (2000) states that acquisitions and takeovers in the Arab world emerge only rarely. Mergers do take place at the national level. In Egypt, Jordan, Lebanon and Saudi Arabia, banks are joining forces to increase market share and adapt to a changing business environment and increasingly competitive market, not for the purposes of control and discipline.
- 4- Debt holders are usually banks that have either a strong tie with the owning family or are major partners in the firm. For example, the owners of the largest banks and companies in Saudi Arabia are a few families (Arab Bank Publications 2002). Moreover, the data in Table 3.10 show the ownership structure of Arab firms. Individuals or families own 61%, then institutions with 26% and finally government at around 13%. Altowaijari (2002) states that 95% of Arab firms are family owned, meaning that 95% of the 61% (or 58% of the firms) are owned by families. Families who usually manage these companies and institutions have a significant presence on these companies' boards. Banks who are the majority holders of the firm's debt are also a significant owner of these firms and are

represented on their boards. Consequently, agency conflicts are minimal and there is no need for the market of corporate control to tame such conflict.

Rajan and Zinglaes (1995) claim that the effect of the concentration of ownership on capital structure is far from obvious. The presence of large shareholders on the board reduces agency costs. If these large shareholders are not diversified, they will be averse to debt. On the other hand, if these large shareholders are banks, they may force the firm to increase its debt by borrowing from the owning bank. Bathala, et al. (1994), show that the use of debt and managerial ownership are inversely related to institutional ownership in the firm.

In summary, the Arab firms where the majority is owned by families will use debt rather than equity not because of the information asymmetry argument (most of the available debt is in the form of informed bank debt), they rather do so because they want to avoid diluting the ownership and losing control over the firm. On the other hand, families force the firms they manage to use debt because they are also the majority owners in the banks that provide the firms with the needed loans. Finally, the government ownership gives a great boost to the lenders confidence, which in turn will increase the level of debt.

3.7 Arab Culture and Society

Arab culture is very much unlike that of the West, which is more materialistic. Since its very beginning, the religion of Islam has been promoting cooperation in the sense that the ultimate payback is in the afterlife; people should help those in need for no or minimal return. As was emphasized earlier, Islam (on a par with the ten commandments) prohibits interest. One justification for this prohibition addresses the

return without risk or return without work. People should invest their wealth in projects without multiple intermediaries (bank to stock markets to corporations to projects and then to production); a person can invest by himself or by partnering with others in productive investments. Some Muslim scholars argue that even limited liability is not a practice of Islam because the company may incur more loss to the society than the value of the shares of its owners. This is considered unfair and destructive of society's economy and morality; the owners should assume full responsibility for their actions (Al Omari 1999). From this logic, debt instruments are not of great appeal to the Arab (99% Muslims) audience, which will turn their attention to direct investments in proprietorships or partnerships. Nonetheless, this has not hurt banking in the Arab world to a great extent for two reasons:

- 1- Arabs are the least of the Muslims to strictly follow the teachings of Islam.
- 2- Islamic banking has dressed interest rates in a Muslim dress and used very creative means to make interest rates look like investments that are accepted by Islam. The Publications of the Saudi Alahli (Alahli 2002) bank gives the following examples of these innovations:
 - a- Buying an asset at a known market price and selling it to the bank customer at a higher price in return for repaying in periodical installments (buy and sell arrangements).
 - b- Financing a project by buying part of the future cash flows of the project. The sum of these future cash flows is larger than the loan.
 - c- Capital leases. .
 - d- Mortgage financing by buying future rent revenues of rented real estate or buy buying part of the future salaries of the owners of the house.

These innovations are similar to those discussed in the Islamic banking subsection, but are simplified to attract less educated individuals.

As Arabs are known for their generosity, it would be considered a shame to refuse lending money to trustworthy friends or family members. This, coupled with the family ownership and management of most companies in the Arab world, makes formal equity financing weaker and debt financing weakest. Finally, it is the Arab tradition to keep business practices and financial matters a secret of the family that owns the business. One of the prophet Mohammed's recommendations to Muslims is to do their business in low profile like manners. In summary, the Arab culture and traditions call for using less debt.

This chapter presented the institutional factors and country traditions that are expected to affect both the level and the determinants of capital structure in the Arab world. The analysis above shows that taxes, the banking system, and the ownership structure are expected to have a positive effect on the level of leverage. On the other hand, the legal system, stock markets and the culture are expected to have a negative effect. The effect of these factors on the determinants of capital structure will be analyzed after presenting these determinants in the next chapter.

Table 3.1

Corporate and Personal Taxes in the Arab World

Country	Corporate Tax rate	Foreign corp. Tax rate	Personal Tax Rates on div.	Personal tax rates On Interest	Capital gains tax
Morocco	35%	35%	0%	At the personal tax bracket (13-44%)	0%
Tunis	35%	35%	0%	At the personal tax bracket (0-35%)	0%
UAE	0%	20-55%	0%	0%	0%
Qatar	10-35%	5-35%	0%	0%	0%
		0-25%, 10-50% if 100%			0%
Oman	0-7.5%	foreign	0%	0%	
Lebanon	10%	10%	5%	At the personal tax bracket (2-28%)	0%
Kuwait	0%	5-55%	0%	0%	0%
				at the personal tax bracket (5-30%)	0%
Jordan	15-35%	15-35%	10%		
Saudi	2.5%	25-45%	2.5%	2.5%	0%
				At the personal tax bracket (10-48%)	0%
Egypt	32-40%	32-40%	0%		
Bahrain	45% oil only	0%	0%	0%	0%
				At the personal tax bracket (5-35%)	0%
Palestine	20%	20%	0%		

Source: Info Prod research (1999).

Table 3.2

Salient Features of the Bankruptcy Code in Arab Countries

Country	Forms of Liquidation	Forms of Reorganization	Management Control in Bankruptcy	Automatic Stay	Rights of Secured Creditors
Bahrain, Egypt, Jordan, Kuwait, Oman, Palestine, Qatar, Saudi Arabia, UAE	Voluntary (general assembly) e.g. loss=3/4 of the capital or involuntary (final court order) e.g. failure to pay debt in a timely manner	Trustee and management negotiate terms and conditions. Liquidation if reorganization fails	Liquidator is appointed to supervise operations and safeguard company's funds and assets	None. And creditors have the right to appoint no more than three supervisors to assist and monitor liquidation	Priorities may differ from one country to the other, but mainly as follows: Employees, Government, rents and leases, creditors.
Lebanon, Morocco, Tunisia	Same	Same	Same	If a company is worth more as a going concern than liquidated, then a stay is possible. Harder to do so in Morocco	Same

Source: The respective corporate laws.

Table 3.3

Average Debt Financing in Arab Countries

Country	TD/BV	TD/MV	LTD/BV	LTD/MV	STD/BV	STD/MV
Bahrain	0.147	0.257	0.140	0.241	0.008	0.016
Egypt	0.535	0.397	0.331	0.227	0.283	0.275
Jordan	0.210	0.250	0.154	0.186	0.078	0.085
Kuwait	0.160	0.169	0.124	0.121	0.036	0.049
Oman	0.817	0.726	0.484	0.593	0.470	0.306
Palestine	0.142	0.055	0.077	0.030	0.065	0.025
Qatar	0.303	0.313	0.231	0.229	0.072	0.085
Saudi	0.268	0.317	0.261	0.314	0.006	0.002
UAE	0.407	0.179	0.368	0.148	0.038	0.029
Average 1	0.332	0.296	0.241	0.232	0.117	0.097
Tunisia	0.494	1.293	0.163	0.421	0.331	0.872
Lebanon	0.386	0.803	0.207	0.445	0.179	0.358
Morocco	0.039	0.040	0.039	0.040	0.000	0.000
Average 2	0.306	0.712	0.136	0.302	0.170	0.410

Table 3.4

Arab Markets Statistics (as of 12/31 of the respective years)

	Year	Palestine	Jordan	Bahrain	Tunis	SA	Oman	Kuwait	Egypt	Morocco
GDP in Billions of USD	97	3.6	7	6.4	18.9	146.5	15.8	30	75.6	33.4
	98	4.3	7.3	6.2	20	128.4	14.2	25.3	82.7	35.6
	99	5.2	8.1	6.6	20.8	139.2	15.6	29.7	89	32.1
	2000	4.3	8.3	10.1	19.5	165	19.6	29.3	98.7	33.5
	2001	3.8	8.6	10.5	20.77	171.6	20.38	30.47	102.16	35.68
Number of listed companies	97	20	139	40	34	71	119	74	650	49
	98	20	150	42	39	74	137	78	861	53
	99	23	152	41	44	72	140	85	1033	54
	2000	23	163	41	44	75	131	86	1070	54
	2001	23	161	42	45	76	96	88	1115	55
Market Capitalization in Millions of USD	97	570	5456	7826	2316	39378	7312	29674	20875	12248
	98	811	5863	6771	2229	42630	4536	18423	24525	15610
	99	995	5834	7161	2638	60952	4303	19598	33039	13702
	2000	801	4973	6624	2809	67166	3518	19847	30791	10875
	2001	743	6314	6601	2229	7301	2634	26661	24309	9031
Trading Volume in Millions of USD	97	25	501	472	225	16547	3875	34447	6018	1067
	98	68	705	910	174	15628	2854	17503	4120	1940
	99	112	892	626	697	24564	1096	8228	14516	3342
	2000	172	869	255	412	23861	531	9518	6127	795
	2001	140	934	249	342	22222	417	11709	5912	840
Capitalization/GDP %	97	16%	78%	122%	12%	27%	46%	99%	28%	37%
	98	19%	80%	109%	11%	33%	32%	73%	30%	44%
	99	19%	72%	109%	13%	44%	28%	66%	37%	43%
	2000	19%	60%	66%	14%	41%	18%	68%	31%	32%
	2001	20%	73%	63%	11%	40%	13%	87%	24%	25%
Trading volume/GDP %	97	1%	7%	7%	1%	11%	25%	115%	8%	3%
	98	2%	10%	15%	1%	12%	20%	69%	5%	5%
	99	2%	11%	9%	3%	18%	7%	28%	16%	10%
	2000	4%	10%	3%	2%	14%	3%	32%	6%	2%
	2001	1%	11%	2%	2%	13%	2%	38%	6%	2%

Table 3.4 (Continued)

Trading	volume/97	4%	9%	6%	10%	42%	53%	116%	29%	9%
Capitalization %										
	98	8%	12%	13%	8%	37%	63%	95%	17%	12%
	99	11%	15%	9%	26%	40%	25%	42%	44%	24%
	2000	21%	17%	4%	15%	36%	15%	48%	20%	7%
	2001	5%	15%	4%	15%	304%	16%	44%	24%	9%

Sources: Annual Arab unified reports and the Arab Monetary Fund Publications.

Table 3.5

The Role of Arab Stock Markets in the Development of
Arab Countries' Economies

Countries' gross domestic product is the dependent variable. NUM is the number of listed companies on the exchange, CAP is the total capitalization for the market and TV is the average annual trading volume.

Model Regressors	Parameter Estimates
Intercept	3.842 (0.67)
NUM	0.031*** (2.01)
CAP	0.002*** (3.57)
TV	0.002** (1.82)
Model F	29.38***
R ²	.683

The sample size is 44. The significant levels of the estimated coefficients are for the two-tailed test based on *a priori* predictions. R² is the REG r-square, t values are given in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

Table 3.6

Financing Patterns in Arab Countries, US and Developing Countries Firms

Country	Internal	External	Debt	Equity
Bahrain	-1%	101%	-2%	103%
Egypt	-3%	103%	19%	83%
Jordan	1%	99%	15%	84%
Kuwait	10%	90%	13%	78%
Lebanon	-4%	104%	1%	104%
Morocco	77%	23%	-5%	28%
Oman	16%	84%	41%	43%
Palestine	18%	82%	8%	74%
Qatar	5%	95%	16%	79%
Saudi	2%	98%	9%	89%
Tunis	-5%	105%	58%	47%
UAE	60%	40%	14%	26%
Tax Arab Countries	13%	87%	19%	68%
Non-tax Arab Countries	18%	82%	8%	74%
All Arab Countries	15%	85%	16%	70%
US	86%	14%	13%	1%
Developed Countries	72%	28%	25%	3%
Developing Countries	39%	62%	22%	40%

Calculations are adopted from the Singh and Hamid 1992 methodology.

Table 3.7

Corporate Bond Market Statistics in the Arab world (in Millions USD)

Country	Bond Market Capitalization	Number of Issues	Bond Market Capitalization as a fraction of GDP (%)
Bahrain	597	5	56.86
Egypt	1412	30	1.38
Jordan	100	10	1.16
Kuwait	507	9	1.66
Lebanon	840	NR	5.38
Morocco	373	19	1.05
Oman	0	0	0.00
Palestine	0	0	0.00
Qatar	1055	2	1.23
Saudi Arabia	0	0	0.00
Tunis	48	2	0.23
UAE	204	3	0.44

Source: AMF joint economic report 2001

Table 3.8

Arab Banks Statistics (in Billions USD)

Category	Number
Number of Banks	356
Number of Branches	9724
Total assets	574
Total equity	54
Deposits	360
Loans	355

Source: Emirates Al Bayan (2002)

Table 3.9

Comparison of Bank, Bond and Stock Markets in Arab Countries

Country	Bank Credit to the Private Sector as a Fraction of GDP (%)	Stock Market Capitalization as a fraction of GDP (%)	Bond Market Capitalization as a fraction of GDP (%)
Bahrain	69	109	6
Egypt	68	37	1
Jordan	95	72	1
Kuwait	48	66	2
Lebanon	172	10	5
Morocco	52	43	1
Oman	44	28	0
Palestine	20	19	0
Qatar	57	65	12
Saudi Arabia	25	44	0
Tunisia	60	13	0
UAE	65	70	0

Sources: Stock market and bond market data are from the AMF Joint Economic Report 2001, and Bank market Data are from both Al Diplomaci Journal 2000 and Ashallah (2001).

Table 3.10

Ownership Structure of Arab Firms

Country	Institutions ^a	Government ^b	Individuals ^c
Bahrain	9%	19%	72%
Egypt	33%	27%	41%
Jordan	18%	19%	63%
Kuwait	7%	14%	79%
Lebanon	40%	0%	60%
Morocco	81%	0%	19%
Oman	21%	21%	57%
Palestine	27%	8%	66%
Qatar	33%	9%	58%
Saudi	2%	18%	79%
Tunisia	33%	9%	58%
UAE	9%	17%	74%
Average	26%	13%	60%

^a Financial and non financial

^b Government and public institutions e.g. social security

^c Families (95%), public individuals and employees (5%)

CHAPTER IV

HYPOTHESES DEVELOPMENT

4.1 Introduction

Capital structure theory has very little to say directly about inter-country differences in corporate financing patterns. No extant theory explains why or how a firm's nationality affects its use of debt. However, one can draw indirect implications from various conceptual approaches comprising the theory. Singh (1995) demonstrates that inter-country variations in corporate financial structures should depend on differences in taxation regimes, transactions costs, and other country specific factors. In general, the institutional arrangements prevailing in different countries, which either mitigate or exacerbate various kinds of market imperfections (including the nature and the incidence of asymmetric information) are the driving force behind the differences in inter-country financing patterns. Mayer (1990) has attempted to explain inter-country variations in corporate capital structures and financing patterns among developed countries in terms of the theory-suggested determinants. He concludes that, except for the control models, the relevant implications of the other models (tax, agency, information asymmetry, product/input, ...etc.) do not accord with the pattern of results he found.

Based on the extant literature, this dissertation identifies variables that are potentially responsible for determining the leverage ratio of a firm. Testable propositions and hypotheses are developed in the context of institutional arrangements and traditions

in the sample countries. In addition to firm specific features, a number of country-related variables are included in the model of determinants of capital structure. This extension relies on the premise that managers not only consider company specific features but also general environmental conditions in choosing sources of finance.

The purpose of this chapter is to identify the measures and determinants of capital structure, analyze the effects of the Arab factors on these determinants, and then develop testable hypotheses. Section 4.2 presents leverage ratios and determinants as suggested by theory and empirical studies. Theoretical signs and significance are compared to the findings in empirical work. Other determinants that are not suggested by theory will also be presented and hypothesized for empirical testing. Section 4.3 analyzes effects of the country traditions and institutional factors on these determinants. Section 4.4 develops the hypotheses for this dissertation.

4.2 Leverage Ratios and Theoretical

Determinants of Capital Structure

This section presents measures of leverage. The reasons for using more than one measure are discussed and their implications are explained. Also, brief discussions of the determinants that are suggested by the various theories of capital structure to affect the firm's debt-equity choice are presented. These determinants' relation to an optimal capital structure choice, and their empirical significance are discussed.

4.2.1 Measures of Capital Structure

Six debt ratios will be used as dependent variables to test the determinants of capital structure in Arab firms. These ratios are: total debt (TD), long-term debt (LTD),

and short-term debt (STD) to both book and market values of equity. A summary of the dependent variables is presented in Table 4.1. Book values of debt will be used for the following reasons:

- 1- Taking into account the scarcity of data, only book values of debt data are usually available.
- 2- Bowman (1980) shows that the cross sectional correlation between the book value and market value of debt is very high. While this may not hold for Arab economies, there is no reason to expect otherwise. Consequently, minimal misspecification error is expected because of the use of the book value of debt. Thus no differences in the correlations between debt and its determinants should result from using book vs. market values of debt.
- 3- Due to the weakness of the primary bond markets (see Table 3.7) and the virtual nonexistence of secondary bond markets in the Arab world, bank loans are the dominant form of debt. These are never tradable in secondary markets, meaning that no market value of debt exists.

Titman and Wessels (1988) demonstrate that the coefficients' signs, magnitudes and even levels of significance of the explanatory variables will differ according to the maturity of debt and to whether the debt ratios are measured in terms of book or market values of both debt and equity. Rajan and Zingales (1995) state that the extent and the most important measure of leverage depends on the objective of the analysis; agency problems associated with debt depend on the size of both the equity and the debt used to finance the firms' assets. Thus the relevant measure here would be total debt to total firm value. If we focus on transferring control of the firm from equity to bond holders when the firm is distressed, then the emphasis would be on the firm's ability to meet

its fixed charges, making the interest coverage-ratio the relevant measure of debt. The ratio of total liabilities to total assets is used when we want to measure what is left for equity holders in case of liquidation. They discuss other measures of leverage and their caveats. However, these six measures of leverage, due to their transparency and widespread use, will suit the purpose of this dissertation.

The reasons for choosing six dependent variables are worth emphasizing here:

- 1- Firms with high growth opportunities will have higher market-to-book ratios. Consequently, the debt-to-book value of equity is higher than the debt-to-market value of equity ratios. This will lead to different correlations and levels of significance with the explanatory variables.
- 2- Managers consider the book value of their firm when making debt decisions (which supports the use of debt-to-book-value of equity ratio) while investors consider the market value and its implications on the firm when debt is used (which supports the use of debt-to-market-value of equity ratio).
- 3- It is necessary to find out the determinants of the use of the firms' general level of leverage, i.e. total debt (TD).
- 4- If any leverage is used, we need to know what determines the mix of LTD and STD for financing asset growth. Traditional wisdom calls for matching of financing and investment maturities, LTD to finance fixed assets and STD to finance working capital (variations and mixes of the two that correspond to risk averse versus risk taking firms is not of concern here), but other factors determine the relationship between financing sources and investment opportunities. For example, most developing countries do not even have debt markets. Also Titman and Wessels (1988) have shown that small firms show a

preference for STD. In this context, the determinants of LTD and STD should be observed separately.

- 5- Using market and book values of equity stems from the need to find out whether investors consider the investment opportunity to be financed (i.e. using market value – because NPV for an investment opportunity is added to the market value of the firm; thus the market value matters) or whether they consider the entire firm (i.e. using book value of equity – when assets are added to the firm, the book value of these assets is added to the book values of the assets in place; hence book value matters).
- 6- Book values have more value than market values in the Arab world for the following reasons:
 - a- Because of the low market efficiency in the Arab world, market values either reflect book values or are reached in chaotic ways (not reliable).
 - b- Since bank loans are the dominant source of corporate debt, banks require fixed assets as collateral, which is usually priced at book.
 - c- Bankruptcy and tax laws, among others, consider book (not market) values in their regulations and proceedings.
 - d- Accounting in the Arab world relies on international standards of accounting, which use only book values in financial management (e.g. capital budgets).

For the above reasons, the correlation between the explanatory variables and debt-to-market ratios is expected to be spurious. Conversely, debt-to-book is expected to exhibit a level of significance that would reflect the relationship between leverage and its determinants. Consequently, the analysis will emphasize book debt ratios.

4.2.2 The Explanatory Variables

Based on the extant literature this section identifies variables that are potentially responsible for determining the leverage ratio of the firm. The testable propositions and hypotheses are developed in the context of institutional arrangements and traditions in the sample countries. The following discussions justify the use of the selected determinants followed by the effect of the Arab traditions and institutional factors on their cross-sectional direction and level of significance. These determinants are used to test the hypotheses developed in section 4.4.

This dissertation relies extensively on the previously mentioned empirical works especially those of Marsh (1982), Bradley, et al. (1984), Titman and Wessels (1988), Harris and Raviv (1991), Singh and Hamid (1992), Givoly (1992), Singh (1995), Rajan and Zingales (1995), Graham (1996), Hovakimian, et al. (2001), Booth, et al. (2001) and Antoniou, et al. (2002).

Next, the determinants and their previously estimated signs and levels of significance in both developed and developing countries will be presented. Finally, the effect of Arab country factors on these determinants will be analyzed and expectations for the significance and direction of these determinants will be presented.

4.2.2.1 Collateral

Myers and Majluf (1984) demonstrated that firms should use the least risky financing source first (retained earnings) then, if needed, riskless external debt, then secured debt, and so on until reaching the riskiest of all, equity. Risk refers to the probability of revealing favorable information the management has that the market does not. For this reason, collateralized debt would be in order if internal financing sources

were exhausted. Jensen and Meckling (1976) show that firms may adopt sub optimal investment strategies once debt is used to expropriate wealth from bondholders to shareholders (also known as asset substitution). Collateralizing debt mitigates the firm's tendency to follow such strategy since both shareholders and bondholders carry the burden of bankruptcy. It is also evident from the positive relationship between risk and return that collateralized debt is less risky and costs less than non-collateralized debt. Rajan and Zingales (1995) state that if a large fraction of the firm's assets are tangible, then assets should serve as a collateral, diminishing the risk of the lender suffering the agency costs of debt from issues such as risk shifting. They also suggest that tangible assets retain more value in liquidation. Antoniou, et al. (2002) state that the value of intangible assets almost entirely disappears in bankruptcy while tangible assets benefit from alternative redeployable uses. Also, in firms with more intangible assets, the costs of controlling capital outlays are higher as monitoring is more difficult. Finally, they suggest that when firms have relatively fewer tangible assets, creditors are more likely to impose restrictions. Thus, in most empirical studies, debt was found to be positively related to tangible assets/total assets (TAN/TA) and negatively related to intangible assets/ total assets (INTAN/TA). These two variables will serve as proxies for debt collateral.

4.2.2.2 Non Debt Tax Shield (NDTS)

Firms have the incentive to take on activities that lower their costs; debt does so by deducting interest from taxable income (EBIT: Earnings before interest and taxes) as long as there is income to deduct interest from. This is called the debt tax shield (DTS). On the other hand, depreciation, losses, and investment tax credits provide similar

benefits. These are called non-debt tax shields (NDTS). DeAngelo and Masulis (1980) showed that a substitution relationship between DTS and NDTS.

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. This suggests an inverse relationship between debt and non-debt tax shields. In their comparative static analysis of the relationship between the optimal debt ratio, volatility, the costs of financial distress, and non-debt tax shields, Bradley, et al. (1984) introduced a testable hypothesis stating that the debt ratio is inversely related to the level of the non-debt tax shield. They measured the NDTS by the sum of annual depreciation charges and investment tax credits divided by the sum of annual earnings before depreciation, interest, and taxes. They also contend that R&D and advertising can also be considered as non-debt tax shields since they can be fully expensed in the year they are incurred. Consequently, according to the substitutability hypothesis, firms with high R&D and advertising expenses issue less debt. Graham (1996) discusses NDTS in detail, and suggests that NDTS will be negatively correlated to debt in firms that have no or low operating profits and high probability of bankruptcy while it will be positively correlated to debt in firms that have high profits. His argument is based on the possibility that non-debt tax shields will crowd out debt tax shields when profits are low or equivalently when the effective tax rate is low. He also adds that as in Bradley, et al. (1984), changes in R&D and advertising can also be viewed as NDTS and should be negatively related to debt usage if they serve as tax shield substitutes.

NDTS has been widely debated in many empirical studies; Bradley, et al. (1984) and Bathala, et al. (1994) found NDTS to be positively correlated to debt ratios. As

mentioned earlier, they explained this finding by assuming that NDTS is an instrumental variable for debt collateral. Titman and Wessels (1988) found this relationship to be negative and insignificant. Givoly, et al. (1992) and Graham (1996) found the relationship to be negative and explained it by the known substitutability between DTS and NDTS.

4.2.2.3 Growth

Myers (1977) shows that highly leveraged firms are more likely to pass up profitable investment opportunities; therefore, firms with higher future growth should use less debt and more equity finance to mitigate this agency problem. He uses the market-to-debt ratio of equity as a proxy for growth. Titman and Wessels (1988) claim that the costs associated with the agency relationship between equity and debt holders is likely to be higher for firms in growing industries because they have more flexibility in their choice of future investments and greater opportunities for expropriation of wealth from debt holders. They explain this tendency by the fact that equity-controlled firms may invest sub-optimally to expropriate wealth from the firm's bondholders. They support this claim by arguing that growth opportunities are capital assets that add value to the firm but cannot be collateralized and do not generate current taxable income. Myers (1977) noted that this agency problem is mitigated if the firm issues short-term debt, which suggests a substitutability relationship between short-term and long-term debts. Growth should have a negative relationship with long-term debt and a positive relationship with short-term debt. He uses capital expenditure over total assets, percentage change in total assets, and R&D over sales to proxy for growth. Bathala, et al. (1994) suggests that a high growth rate indicates the profitability and success of the

firm in adding more resources into the firm, which could be associated with lower information asymmetry costs of equity and hence a preference of equity over debt financing. Rajan and Zingales (1995) offer two main reasons for a negative relationship between leverage and growth. First, it is expected that as the market-to-book ratio of equity (as a proxy for firm growth) increases, so does the cost of financial distress. Second, firms prefer to issue equity when the stock is over-valued. Antoniou, et al. (2002) argue that an increase in the probability of success in a positive NPV opportunity increases the market-to-book ratio of equity. This increase in the market value of the firm's equity can be seen as an incentive to issue equity rather than debt to finance that project. Booth, et al. (2001) adopts Scott's (1977) secured debt hypothesis and the growth option argument of Myers (1977) to conclude that debt is expected to have a negative relationship to the market-to-book ratio (M/B). The marginal borrowing power on a dollar of market value should be less than that on a dollar of book value, because the latter is an existing investment while the former is an investment opportunity. Givoly, et al. (1992) argue that M/B is a measure of firm performance (Tobin's Q). Better performing firms have a higher capacity for debt, and debt may exhibit a significant, positive relationship with M/B.

Other measures of growth have reported in other studies. Bathala, et al. (1994) used the past growth in total assets, while others used percentage change in the value of the firm. As in most studies, the market-to-book ratio of equity will be used as a proxy for firm growth in this dissertation.

4.2.2.4 Uniqueness and Industry Classification

Titman and Wessels (1988) and Hovakimian, et al. (2001) were the only

researchers encountered in the literature review to deal with uniqueness. Uniqueness was proxied for by the employee-quit ratio (employee turn-over, which is expected to be low for firms that have unique technology) and R&D expenditure. Debt was found to be negatively related to uniqueness because of the dangers of going bankrupt if debt requirements were not fulfilled coupled with the high expenditures for unique labor, cost of sale, high R&D, etc. Bradley, et al. (1984) found that leverage ratios range from a low of 9.1% for drugs and cosmetics to a high of 58.3% for airlines. A standard ANOVA using industry variables and showed that 54% of the cross-sectional variance in firm leverage can be explained by industrial classification. Furthermore, they found more variation in mean leverage ratios across industries than in firm leverage ratios within industries. Finally, they found a significant, positive relationship between the level of leverage and the level of regulation in industries. Despite the fact that these two variables are of great importance in analyzing capital structure, because of the nonexistence of data on such variables, uniqueness and industry classification will not be considered here as factors that may affect the use of debt. This omission may hurt the specification of the model used in this dissertation, but knowing the irrelevance of uniqueness in the Arab world and knowing that the data includes only large listed manufacturing firms (homogeneous), it is safe to expect those two variables to be insignificant. Dropping them should neither bias this work's results, nor should it cause any misspecification to its tests. These two factors will be left for further research.

4.2.2.5 Size

Warner (1977) suggested that leverage ratios might be related to firm size. He provided evidence that relative bankruptcy costs are negatively correlated with firm size

for railroad companies. It is also known that relatively large firms tend to be more diversified and less prone to bankruptcy, suggesting that large firms should be highly leveraged. Marsh (1982) argues that because of company-size-related differences in long-term debt floatation costs, smaller firms are expected to have a lower long term debt ratio and a higher short-term-debt to total-debt ratio. In that context, Titman and Wessels (1988) and Givoly, et al. (1992) point out that the cost of issuing securities is also related to firm size. Large firms have lower relative floatation costs; this suggests that small firms may use more short-term leverage than large firms because they would prefer bank loans to any security (bonds included) to avoid the higher cost of issuing such securities. Alternately, large firms have more access to long-term debt markets than do smaller firms, causing short-term debt to be a non-avoidable substitute for the former. Also, large firms are perceived to have more collateral and more assurance of longer existence than smaller ones. Exchange requirements and the reputation of being listed in capital markets are other assurances to creditors. Since larger firms usually have a higher market share and most likely are more diversified, debt would seem a good strategy, especially when debt tax shields are desired. Rajan and Zingales (1995) suggest that size is ambiguous because larger firms are more diversified and less likely to go bankrupt. Hence, size may be an inverse proxy for the probability of bankruptcy; thus a positive relationship between debt and size is expected. On the other hand, size may be an inverse proxy for the amount of information outside investors have, increasing their preference for equity relative to debt. Booth, et al. (2001) include size as an independent variable since it is associated with survival and the agency costs of both debt and equity. Their argument is based on that of Rajan and Zingales (1995). Antoniou, et al. (2002) argue that since monitoring costs are higher in smaller firms than in larger firms, then

information asymmetry in large firms is smaller; consequently, larger firms are likely to have easier access to debt markets and borrow at lower cost.

Many measurements of size have been used in studies (e.g. natural logs of firm value, firm assets, and sales). The natural log of sales $\text{LN}(S)$ is used most frequently and will be used as a proxy for size here. Previous studies show that size usually exhibits a positive relationship with long-term debt and a negative relationship with short-term debt; these were the findings of Titman and Wessels (1988) among others.

4.2.2.6 Volatility

The main restriction of debt financing is the availability of cash to service it in a timely manner. Any fluctuation in the availability of cash simply means that creditors will drive the firm into bankruptcy (unless of course the indenture specifies otherwise, or there is a close long term relationship between the firm and its creditors as in most bank-based economies). Business risk usually causes unwanted fluctuations in the level of cash the firm needs to hold. Volatility of earnings is a measure of such risk; since debt requires a steady level of cash flows then it only makes sense that firms with volatile earnings should use less debt.

Bradley, et al. (1984) presented the most comprehensive theoretical and empirical analysis of volatility and its relation to the optimal debt ratio. They use comparative static models and empirical evidence to study the relationship between optimal debt level and volatility. Volatility is defined as the standard deviation of the first difference in annual earnings, scaled by the average value of the firm's total assets over the period. Their empirical results conform to their theoretical hypotheses; volatility is significant and negatively related to firm leverage ratios. They test the

relationship between the optimal debt ratio and volatility under different values for non-debt tax shield (NDTS) and costs of financial distress (COFD). When both NDTS and COFD are assumed to be zero, the optimal ratio is always 100% because a firm that has zero leverage-related costs realizes all the positive tax advantage of debt leading to 100% debt financing. On the other hand, positive COFD and NDTS causes the relationship between debt and volatility to be the inverse. This is consistent with the notion that greater present value of leverage-related costs lowers the level of debt. Other empirical work reviewed here illustrates the argument that a negative relationship exists between debt and volatility. These studies calculate volatility in different ways, the most common measure being the standard deviation of earnings before interest and taxes (EBIT). This dissertation will use this definition as well.

4.2.2.7 Profitability

Myers and Majluf (1984) state that firms use retained earnings as the first and safest source of financing to avoid signaling and transaction costs. However, this choice is predicated upon the existence of free cash flows after dividend payments are met. Myers (1977) cites evidence from other empirical works suggesting that firms follow a pecking order in their financing sources, first from retained earnings, second from debt, and third from issuing new equity. This argument suggests that a firm's profitability is a strong determinant of its capital structure. Marsh (1982) states that he included profitability because Martin and Scott (1976) found them useful discriminators rather than because of any very strong prior grounds. Rajan and Zingales (1995) contrast the information asymmetry of Myers and Majluf (1984) with Jensen's (1986) free cash flow agency costs. Since in Myers and Majluf (1984), firms preferred retained earnings to

debt, then profitability should be negatively correlated with leverage. Jensen (1986) suggests a positive relationship since, in a strong corporate control market; firms are forced to commit to paying cash by leveraging up. Shareholders use debt as a disciplinary tool against managers to avoid consumption of excess perquisites. If the market for corporate control is ineffective, and if managers of profitable firms prefer to avoid the disciplinary role of debt, then it is expected that a negative relationship between profitability and debt would exist. Another consideration raised by Rajan and Zingales (1995) is that investors are more willing to lend to firms with high profits, thus reducing the cost of debt, providing incentives for profitable firms to use more debt. Singh and Hamid (1992), Singh (1995) and Booth, et al. (2001) show that profitable firms in developing countries use less debt. Antoniou, et al. (2002) state that the negative relationship between debt and profitability is also supported in smaller firms because they do not have access to capital markets, nor do they qualify for large long term bank loans; hence, they must use their profits to finance growth. As in most studies, EBIT/TA will be used to capture profitability's relation to debt.

4.2.2.8 Taxes

As the interest on loans is tax-deductible, firms with higher tax liability have an incentive to use more debt. This argument holds only if firms have sufficient taxable income. In calculating the tax deductibility of debt, the effective tax rate is what counts, not the statutory tax rate; the reason is that interest is deducted from earnings before tax and after deducting all non-debt tax benefits (i.e. investment tax credit, operating losses, and depreciation). Titman and Wessels (1988) failed to find any significant effect of corporate tax on financial decisions. That finding was established by showing that non-

debt tax shields are not a significant determinant of capital structure. Givoly, et al. (1992) define the effective tax rate as the present value of taxes paid on an additional dollar of income after accounting for all non-debt deductions. Graham (1996) states that, when compared with a low marginal tax rate (MTR), firms with a high MTR have greater incentive to issue debt. The reason is to take advantage of higher interest deductibility. This implies a positive relationship between MTR and leverage. Booth, et al. (2001) uses the statutory tax rate instead of MTR to deduct interest. Antoniou, et al. (2002) suggest that higher corporate tax rates would result in lower internal funds as well as higher cost of capital. As a result, the demand for debt should decrease with increasing MTR. This is true if the tax rates are extremely high and the non-debt tax shields consume all income to a point where there is no benefit to using debt since there are no more tax-deductible earnings. As in most studies, MTR is calculated as paid taxes divided by earnings before interest and taxes (TAX/EBIT) to show the taxes paid on each additional dollar of operating income after accounting for all deductions (but interest itself). MTR can be seen as a proxy for debt tax shield, the higher the MTR the higher the benefit from debt and the more debt to be used. Of course, in the countries that have no taxes, this variable will always equal zero. Consequently, the way to test the effect of taxes is to test whether MTR is a significant determinant of capital structure.

4.2.2.9 Dividends

According to the POH of Myers and Majluf (1984), retained earnings (profits-dividends) are the first source of financing. Knowing that retained earnings have a negative relationship with dividends paid (retained earnings = net income-paid

dividends) and leverage has a negative relationship with retained earnings (external financing (XF) = equity financing (EF) + debt financing (DF) = total financing (TF) – internal financing (IF)), we conclude that debt has a positive relationship with dividends. Alternatively, higher dividends lower retained earnings and increase the need for external financing. According to POH, debt is the next in line as a source of funds. Thus, higher dividends call for higher debt. La Porta, et al. (2000) shows that in weak law countries (most Arab countries) firms pay dividends to build the reputation that they care for their shareholders. Their motivation is to use this reputation to market future equity issues. This means that dividends are paid for future external equity financing not debt financing, which implies a negative relationship between debt and dividends. This is due to the negative relationship between debt and external equity financing. As in the case of profitability, Marsh (1982) states that he included payout ratio because Martin and Scott (1976) found it useful discriminators rather than because of any very strong prior grounds. He also states that since companies may continue to pay dividends when they are losing, the payout ratio is not statistically well behaved and can be misleading. Givoly, et al. (1992) included dividend yield as one of their explanatory variables to proxy for personal taxes. They found a negative relationship between debt and dividend yield. This is in accordance with Miller (1977) and DeAngelo and Masulis (1980) in that personal taxes consume at least a portion of the gain from leverage that accrued at the corporate level. Paid dividends divided by net income (DIV/NI) -or the firm's payout ratio- will be used as a proxy for dividends.

Due to the fact that Arab firms generate inadequate returns, have to pay dividends to build the reputation La Porta, et al. (2000), and follow a reverse POH, then we expect the level of debt to be negatively related to dividends in both tax and non-tax

Arab countries. To capture the effect of personal taxes, and to isolate the effects of dividends (mentioned above), an interaction term between dividend yield and the marginal tax rate is in order. Such interaction will capture the effect of personal taxes on debt in tax Arab countries only. This interaction will have a value of zero in non-tax Arab countries since the MTR there is zero. Since investors prefer more wealth than less we expect them to prefer dividend income (which is always taxed at a lower rate than interest income) over interest income unless they are compensated for this tax differential. However, this compensation makes debt financing more expensive to firms, and unless the corporate tax break overcomes this cost, then firms will prefer equity financing to debt financing. Accordingly, debt is expected to have a negative relationship with this interaction term.

4.2.2.10 Financial Distress

Jensen and Meckling (1976) and Myers (1977) suggest that highly leveraged firms may forego good investment opportunities due to the burden of debt. The reason is that debt holders claim most of the investments' profits. This transfer of wealth is an incentive for shareholders to forego the profitable investment opportunity. The value of the foregone opportunities plus the costs of enforcing the contractual provisions constitute the agency cost of debt. Myers (1977) argues that advertising and R&D create assets that may be viewed as options, which will be exercised according to the firm's financial well being and at the management's discretion. This suggests that the associated agency costs are higher compared to other assets. Consequently, if R&D and advertising expenditures are considered proxies for agency costs, then firms with high levels of such costs are expected to have lower leverage. This expectation coincides with

Bradley, et al.'s (1984) argument that debt is inversely related to R&D and advertising though the rationale is different (they consider them as NDTs). Also, Titman and Wessels (1988) found a negative relationship between debt level and R&D, which is considered a proxy for growth.

Bradley, et al.'s (1984) comparative static model implies that leverage is inversely related to the costs of financial distress, which include bankruptcy costs and agency costs of debt regardless of the variable used to proxy for these costs. Jensen (1986) and Stulz (1990) show that debt serves to limit managerial agency costs in profitable firms that lack investment opportunities. Givoly, et al. (1992) uses the inverse of Tobin's Q as a measure of the loss of growth opportunities and as a proxy for bankruptcy costs. They find it to be negatively correlated with leverage. Jung, Kim and Stulz (1996) show that when management pursues growth objectives, management and shareholders' interests coincide, and external equity is valuable to a firm with strong investment opportunities. Graham (1996) uses the Z probability to measure the probability of bankruptcy, Where Z is calculated as in equation 4.1.

$$Z = \frac{TA}{3.3EBIT + 1.4RE + 1.2WC} \quad (4.1)$$

where

TA = total assets,

EBIT = earnings before interest and taxes,

RE = retained earnings, and

WC = working capital.

He hypothesizes that Z should have a negative relationship with debt. Booth, et al. (2001) suggest that where the potential for corporate opportunism is high, debt levels

will be low and will consist of short-term debt, especially for small firms with large intangible assets. This implies that short-term debt ratios are expected to have a positive relationship with growth. This relationship is also consistent with the Myers (1977) argument mentioned in the growth section above. Booth, et al. (2001) thought of financial distress (bankruptcy cost BRC) as the product of the probability of entering a distressed situation and the cost of resolving such a situation. The probability of financial distress decreases when tangible assets (TAN) act as collateral for debt issues. TAN/TA will be used as a proxy for distress and we expect a negative relationship between debt and financial distress. Since financial distress has a negative relationship with tangible assets, one expects a positive relationship between debt and tangible assets.

In summary, these factors will be tested as determinants of CS in the Arab world for the purposes of this dissertation. Table 4.2 summarizes these factors.

4.3 The Effects of Arab World Country Traditions and Institutional Factors on the Determinants of Capital Structure

Our knowledge of capital structure has mostly been derived from Western economies that have many institutional similarities. The goal of this dissertation is to investigate the capital CS in the Arab world, which has different institutional features. The effect of the Arab countries' traditions and institutional factors on the directions and levels of significance of the determinants of CS are developed in this subsection. Each of the six factors discussed in the previous chapter will be analyzed separately because not all are expected to affect each of the determinants. The direct effect of these factors on the level of debt was discussed in chapter III.

4.3.1 The effects of Arab Capital Markets

Arab capital markets are at their earliest stage of development. They remain characterized by low efficiency, low transparency and low liquidity and depth (Abu Alrub and Barakat 1999). For these reasons, investor confidence in these markets is low, though the returns on these markets have been high for the reasons mentioned previously (e.g. the general trend of increasing stock prices in the last decade). The low confidence in these markets results in investors' reliance on the book value of the firm's assets to price the firm's stock (Abu Al Rub and Barakat 1999). This leads to the conclusion that debt-to-book ratios will exhibit higher levels of significance than debt-to-market ratios. The market for bonds is weak, while there is no secondary market. Also, the fact that most debt is in the form of bank loans, which are valued at book, supports our hypothesis that debt-to-book ratios are more relevant and significant than debt-to-market ratios. Because of these market inefficiencies, the market is not expected to react significantly to many of the determinants. However, tangible assets (a book item that markets pick when valuing securities in the Arab world) are always a sign of the availability of collateral in the debt market (especially bank debt markets), and it is expected to be significant and to have a positive sign. Sales volume and intangible assets can be seen as a sign of good reputation, which can be added to the firm's assets. These are expected to be significant and positively related to the use of debt. As far as the market is concerned, especially the market for bank loans, the existence of large sales and large intangible assets should help firms acquire more debt. On the other hand intangible assets may be considered as lack of collateral especially if they comprise a good percentage of total assets. This results in an undecided direction for this variable. Paying dividends is a sign of commitment to shareholders, which is not a good sign to

banks unless banks are owners in that firm. This variable is expected to exhibit a negative effect on the use of debt and is expected to be significant. Singh and Hamid (1992) suggest that because of the increase in stock prices in developing countries (e.g. Arab countries) investors are making high returns from capital gains. These high returns give firms the incentive to pay fewer dividends and use retained earnings as an alternative to finance growth. Azzam (1995) shows that stock markets have been the more popular investment outlet for surplus units for several reasons. First, stock prices increased in the nineties. Second, it is an acceptable alternative to investing in the tabooed interest based outlets (interest paying investments). A third reason, is the firm's inability to generate enough profits to pay previously committed dividends or to service debt. Hence, firms may issue stocks to finance growth and to pay dividends to attract new investors. The weak law countries argument of La Porta, et al. (2000) also supports the role of stock markets in paying higher dividends and borrowing less. For these reasons, markets enhance the significance of the negative correlation between the level of debt and dividend yield. Rajan and Zingales (1995) deduce that the market-to-book ratio is expected to be negatively correlated with debt due to the tendency for a firm to issue stock when its price is higher than its intrinsic value. On the other hand, since existing Arab capital markets do not exhibit high efficiency, performance measures are not of great importance. Thus, M/B is not expected to show significance.

4.3.2 The effects of the Arab Culture

Arab culture is not debt oriented due to prohibitions against interest rates and the belief in helping and trusting even in business matters. Moreover family ownership promotes cooperation among family members, especially if that family is wealthy.

These cultural factors promote free informal borrowing (or at most a favor for a favor but still no direct financial cost) only when absolutely unavoidable, Abdelmajeed (2002). This gives profits a greater role in borrowing; if a firm is profitable, it will avoid all kinds of formal and informal (favors) borrowing. Thus profitability is expected to be negatively related to the use of any debt. Banks, the major source of debt in the Arab world, cannot avoid these cultural factors when deciding on granting a loan. Nevertheless, it helps to know that the borrower is well established. These cultural factors help lower the significance of debt altogether, especially in the long run. These cultural factors should lend significance to bank and bank-like loan determinants such as tangible or intangible assets and sales, which are expected to be of positive significance.

4.3.3 The Effects of Arab Banking Systems

Thus far, it has been established that the Arab banking system is very advanced and that banks consider the known standards and requirements of loans from reputation to collateral to expected investment project cash flows. Also, banks do not rely on market information when granting a loan; they require detailed studies before considering any loan application. The known five C's of lending (Character, Capacity, Collateral, Capital, and Credit) reveal the requirements of borrowing. They will be used as a guide to find the effect of banking on the determinants of capital structure.

- 1- Character: the requirement that the borrower has the willingness to repay the loan, a sense of responsibility, and that this sense of responsibility is demonstrated. Past performance and established reputation are the means of proving such character. Consequently, firms need to follow certain policies to establish such character; dividend policy is an example of such policies. Thus,

firms need to lower dividends when they draw loans. This is explained further below.

- 2- Capacity: the borrower's ability to demonstrate the ability to repay loans. This involves the financial well-being and stability of the sources of income to be used to repay loaned funds. Sales, future prospects of the firm and existing capital are some of its determinants. Thus, one expects the capacity to borrow to be positively correlated with sales and firm growth when the source of borrowing is bank based.
- 3- Collateral: provides incentive for the borrower to repay the loan and a means of at least partial recovery if the borrower defaults. Fixed assets are a source of such collateral; this is the reason why tangible assets are expected to show higher significance in bank-based than in market-based borrowing.
- 4- Capital: provides a cushion for repayment in the event of the member's having a financial setback. It also confirms that the borrower manages his/her financial affairs adequately and within his income. High profitability and low dividend yield are factors that positively affect the firm's capital and capacity to borrow. Thus, profitability and dividend yields are expected to show higher levels of significance.
- 5- Credit: a long business relationship between banks and the borrowing firm help establish credibility. Also, the firm's past ability to meet obligations and its ability to minimize internal problems like agency and bankruptcy costs help expand the firm's credit. This factor enhances the significance of agency and financial distress factors as determinants of capital structure.

In summary, high market-to-book ratios and intangible assets may be seen as a

sign of reputation. Expected sales are a form of collateral, especially in non-tax, non-interest countries where banks purchase part of the project's cash inflows (sales) and use tangible assets as collateral, more so in buy-and-sell and in capital-lease arrangements. These variables are expected to be significantly positive. As far as banks are concerned, commitments to paying dividends hurt their chances of getting paid back, especially when the laws are weak. Knowing that Arab firms suffer from low competitive advantage (Abdelkareem 1998), the existence of high fixed operating costs means that there is a good chance that firms will not be able to generate enough EBIT to pay interest and/or debt principal; dividends and operating leverage are expected to demonstrate negative significance.

Rajan and Zingales (1995) argue that since banks are allowed to underwrite corporate securities (as is the case in the Arab world) and to own equity in industrial companies, the barriers to lending are expected to have a milder effect in bank-based economies. Antoniou, et al. (2002) argue that in a bank-based economy (applies to Arab economies) banks (as lenders) are frequently represented in the supervisory board of the borrowing companies and work closely with their managements. Thus the lenders are likely to be fully aware of the quality of the investment opportunities. This minimizes information asymmetry and lowers the cost of borrowing. Therefore, the relationship between debt and market-to-book ratio is not expected to be negative. Nor is it expected to be significant. They also argue that since collateral is more relevant in traditional bank lending than in borrowing from capital markets, the importance of tangible assets is more prominent and is expected to have a positive and highly significant relationship with debt. Finally, they expect the volatility of earnings to have low or no significance because of the close relationship between banks and the borrowing firms.

4.3.4 The Effects of the Arab Legal Systems

The legal systems in the Arab world suffer from either weak old laws or from the weak enforcement of these laws or both (Abu Bakr 2002). Hence, these weaknesses hurt the firm's ability to raise debt and make debt an expensive source to finance investments. Furthermore, banks' and investors' requirements become more stringent and restrictive when loaning money to firms in such environments. For that reason, bank loan requirements (collateral, reputation ...etc.) are emphasized and expected to come out positive and significant in their relationship with the firm's level of leverage. On the other hand, these restrictions will make dividends come out significantly negative.

These legal drawbacks force firms to use less debt and use more equity because, when combined with the personal tax disadvantage of debt, equity comes out cheaper than debt. The effect of these drawbacks on the determinants will be negative and should diminish their significance; the absence of law causes chaos and diminishes the significance of any organized trends. La Porta, et al. (2000), in an argument that supports this hypothesis, show that in weak law countries (Arab countries are no exception) firms pay dividends to build reputation to be able to market future equity issues not because of the strength of shareholders. This means that dividends are paid for future external equity (not debt) financing, which implies a negative relationship between debt and dividends due to the negative relationship between debt and external equity financing.

4.3.5 The Effects of the Tax System in the Arab World

It is the opinion of this dissertation that taxes are the most potent and decisive factor of all. This factor is expected to be the one that helps this dissertation gain a great deal of significance. As has been demonstrated, the Arab world is divided into tax and

no-tax countries. Taxes are one of the main forces (besides avoiding dilution of ownership and the low liability of using other people's money, etc.) that drive the use of debt. Since interest is deductible from taxable income and dividends are not, it is to the firm's advantage to use debt financing rather than equity. The use of debt is not of great advantage in the Arab world for the following reasons:

- 1- Arab tax laws do not have loss carry backs.
- 2- The data shows that Arab firms report low profitability if not loss.
- 3- Arab firms they pay very low MTR if any at all.
- 4- NDTs either does not exist (in non-tax countries) or is very low because not enough profits are reported to use NDTs.

For these reasons, MTR does not enable firms to benefit from the tax break of interest. However, corporate greed and other benefits of debt will drive towards the use of debt even if the tax benefit is small. Accordingly, MTR is expected to be positive with small magnitude.

Furthermore, because of the low earnings, NDTs is not expected to be of great value in Arab countries; hence, it cannot be perceived as a substitute for debt as in Givoly, et al. (1992) and Graham (1996). However, since Arab economies are bank based, lending banks will perceive NDTs as a sign of collateral which gives the borrowing firm more borrowing capacity. This is consistent with Bradley, et al. (1984). Accordingly, NDTs is expected to have a positive relationship with debt in tax Arab countries and to be of no significance in non-tax Arab countries.

4.3.6 The Effects of Corporate Governance

Arab corporations are owned by governments, rich families, institutions (which

are owned by the very same rich families) and small individual investors. Because of the concentrated ownership, and because the owners are usually the managers, one can conclude that managerial agency conflict is at its minimum. Also, since most debt is bank loans, which are known to be stringent, and also to avoid being denied future loan grants, managers have to work in harmony with their debt holders. As a conclusion, agency conflict proxies (capital expenditure, market-to-book ratio and variability of returns) are not expected to exhibit the traditional negative relationship with debt in the Arab world. This expectation is in part due to concentration of ownership. Rajan and Zingales (1995) argue that ownership concentration reduces agency costs and gives the owner manager the incentive to avoid activities that increase financial distress. Thus the significance of agency cost and financial distress are not expected to be significant. Antoniou, et al. (2002) show that closely held firms pay lower dividends, which implies that dividend yield, albeit negative, will be of small magnitude and of low significance. They also argue that the owners of firms avoid issuing shares to avoid diluting their ownership; and to lower the risk of financial distress, they avoid issuing debt. This implies that profitability will exhibit a stronger negative relationship with debt and a higher level of significance.

Table 4.2 summarizes the hypothesized effects of the Arab country traditions and institutional factors on the suggested determinants of capital structure.

4.4 Hypotheses Development

Thus far we have set the stage to develop the hypotheses of this dissertation. The measures and determinants of capital structure have been introduced and the effects of the institutional factors and country traditions have been analyzed and predicted.

the institutional factors and country traditions have been analyzed and predicted.

To test the applicability of capital structure theory in Arab counties, this dissertation will use the determinants that have been suggested by theory and were tested repeatedly by scholars in both developed and developing countries as we have seen earlier. The empirical tests will seek to determine whether Arab firms are following in the footsteps of western economies in their financing behavior. Differences in country traditions and institutional factors are expected to have some power in explaining differences in aggregate capital structure. Furthermore, cross-sectional differences between firms in a country can be examined by studying the cross-sectional correlations of debt with certain factors that determine the level of debt. Empirical evidence has shown that these correlations hold in the US, developed, and developing countries. This dissertation will examine if these relations hold in the Arab counties and try to explain any cross-country variation in these correlations (tax vs. non-tax countries). If a factor does not work as predicted by theory in a country, it must be either because the theoretical rationale for that factor is spurious, because the data is problematic, or because institutional differences alter how the factor works.

The purpose of this section is to develop the hypotheses to answer the following questions: Are the models of capital structure valid in environments that are different from those in Western economies? Do country traditions and institutional factors affect the determinants of capital structure? Do country traditions and institutional factors affect the order of financing sources? Is the theory of capital structure robust or is it incomprehensive and needing to be amended to be more robust?

The importance of these questions stems from the fact that different country traditions and institutional factors can play a significant role in shaping capital structure

decisions. The analysis above has shown that these factors have a great effect on the level of leverage and on the direction, magnitudes, and levels of significance of the determinants of capital structure.

4.4.1 Failure of the Previous Literature to Address Issue of Interest

Previous literature has not addressed the two main issues in this dissertation, specifically the effects of the absence of taxes and the existence of different country traditions and institutional factors on the determinants of capital structure. From a theoretical perspective MM (1958) showed that capital structure is irrelevant to the value of the firm in the absence of taxes. No empirical work was conducted to test this theory. Moreover, no theory was developed and no empirical work was done to test the determinants of capital structure in the absence of corporate and personal taxes. This dissertation will be the first empirical work to carry out such testing.

Some of the theories have institutional factors and their effects imbedded in them. For example, the agency models of capital structure analyze the effects of the concentration of ownership on capital structure choice. However, no theory has explicitly tackled the effects of the various institutional factors on the firm's leverage. There have been several attempts to empirically test the effects of these factors; these studies are divided into two main groups and each suffers from obvious drawbacks that make it insufficient to tackle this issue.

One group of studies has tested the determinants of capital structure and financing behavior in developed countries (e.g. Mayer 1990; Rajan and Zingales 1995; and Antoniou, et al. 2002). These studies suffer a major drawback; they study countries that have similar institutional factors. Consequently, no variations in the determinants of

capital structure were detected among these countries. They also aggregated the institutional factors into bank-based and market-based economies with the exception of Rajan and Zingales (1995) who studied the institutional factors in detail. For the same reasons (homogeneity in the institutional factors) this group did not find any differences in the aggregate financing behavior in the countries of its sample.

A second group has tested the determinants of capital structure in developing countries (e.g. Singh and Hamid 1992; Singh 1995; and Booth, et al. 2001); however, these studies suffer from two main problems. First, they all used the same sample, which narrows them down to one study. Second, the first two used descriptive statistics to explain why developing countries follow a reverse pecking order and used correlations to find the relationship between leverage and a few determinants (shown in the empirical review in chapter II) without the use of regression analysis and estimation techniques. The Booth, et al. (2001) study aggregated the institutional factors in the country of origin and macroeconomic variables. They ran levels of debt against tax rate (not MTR), business risk, size, profitability, and market-to-book ratio without hypothesizing on the effect of the institutional factors on these variables. They used their empirical results to reach two aggregate conclusions: that the country of origin explains up to 43% of the variation in total debt, and that finance theory is portable across countries due to the similarities in the sign and level of significance of the suggested determinants. In summary, no explicit institutional factors were analyzed.

This dissertation attempts to overcome these drawbacks and offer a comprehensive test of capital structure theory. This work will be the first to consider these institutional factors to test the robustness of capital structure theory.

4.4.2 Hypotheses of Interest

In section 4.4.1, it was pointed out that most of the literature overlooked the environment in which the firm operates (country traditions and institutional factors). Additionally, an argument is made that some countries do not have a tax system in place. Therefore, the incentives to use debt are different from those suggested by the tax models of capital structure theory. Finally, the financing behavior (the choice of financing sources) depends on some macro and micro economic factors that have not been analyzed in theory and in most of the empirical work. Therefore, it is the goal of this dissertation to design empirical research that will address the criticism of the previous literature and test capital structure theory in environments different from those of its birth.

The theoretical review in Chapter II showed that firms do trade off the costs of debt with its benefits in their efforts to minimize costs and increase value. It has also been demonstrated by empirical tests that there are determinants of the optimal level of leverage. The deductibility of interest is the main driving force behind the use of leverage. Nevertheless, there are other reasons for the use of debt. Asymmetry of information enables the firm to extract wealth from using leverage by paying less return for what is riskier than what lenders know. Another motive is keeping ownership from the dilution that accompanies the issuance of more equity as a source of funds. A third reason is the use of leverage to mitigate the agency costs by committing the firm to fixed financial costs that discourage management from consuming perquisites. The sum of these incentives can be modeled in a linear multi-factor model that will show the magnitudes and directions of these effects. In summary this model will include the determinants of the level of leverage that maximizes the benefits of the use of such

financing resources for a given level of costs or minimizes such costs for a given level of desired benefits. In economics, this approach is called comparative statics or the static tradeoff between the benefits of debt and its costs.

Similar firms that operate in homogeneous environments are expected to behave in a similar manner. In other words, firms that face similar opportunities and constraints should pursue activities and make decisions in the same fashion. This has an intuitive appeal to it since firms' objective functions are similar: to increase the net worth of the firm. For these reasons it is only logical to expect firms that have similar environments to have similar levels of leverage and similar determinants of leverage.

Since Arab countries have a similar economic system to that of Western countries, Arab firms' financing characteristics should be similar to those of Western firms. The way to test this hypothesis is to examine whether the determinants of capital structure in Arab firms exhibit similar behavior to those of firms in Western economies. Theory is a universal finding of facts that should be valid within a given set of assumptions. Accordingly, it is logical to assume that Arab firms would conform to the same theory that Western firms follow, if these firms operate within the assumptions of that theory. Since the theory mainly emphasizes the tax implication of the use of debt (i.e. the tax deductibility of interest) and since Arab economies have similar tax laws, Arab firms' financing behavior is expected to be similar to that of Western economies.

Two constraints limit this hypothetical situation: first, the fact that some of the Arab countries do not have taxes, and second, Arab countries' institutional factors are different from those in Western economies. These two constraints account for some differences in the directions and levels of significance of the suggested determinants of capital structure. Booth, et al. (2001) concluded their study by finding that although

finance theory is applicable across countries, more in-depth analysis is needed to understand the impact of institutional factors on capital structure choices. It is the purpose of this dissertation to do so. Subsequently, the following hypotheses will be tested for Arab countries, which have a unique set of institutional factors.

4.4.2.1 Tax Hypotheses:

The first set of hypotheses is designed to test the tax models of capital structure theory. In MM's (1958) perfect world (no taxes, no agency costs, no informational asymmetry etc.) capital structure is irrelevant on the basis of the "no pain no gain" argument. With no DTS and no COFD, leverage is irrelevant. In MM (1963), they show that if there is no pain and there is a gain from debt (DTS but no COFD) then the optimal level of leverage is 100%. Reality is different; there is a benefit from debt (DTS) when there is a tax system, and there are disadvantages to debt (COFD). Consequently, the optimal level of leverage for a firm is one that equates its marginal benefits with its costs. This is the main premise of the tax model of capital structure theory.

The Arab world provides us with a rare opportunity to test this theory. It is the only collection of countries with homogeneous characteristics in many respects, with the exception that some of the countries do not have taxes. This is similar to an ideal hypothetical situation where some of the US companies pay taxes while others do not. Such a situation will give us a clean-cut answer to whether taxes do affect the level of firms' leverage. If firms in the tax Arab countries use more debt than those in the non-tax Arab countries, then taxes do affect the choice of capital structure and we will have found rare and clear evidence that support the tax model of capital structure. Since the tax laws in the Arab world are similar to those described in the tax models of capital

structure, then one would expect to find supporting evidence for this theory in the Arab world. This leads us to the first testable hypothesis of this dissertation.

H1: Firms in Arab countries with a corporate tax regime are expected to have higher leverage than those in countries with no corporate taxes.

Knowing that the firms in the sample operate in a different environment from the environment of the theory, it is safe to assume that the hypothesized positive differential in the use of debts between the two groups of countries may be due to other factors that the theory failed to consider. To test the robustness of the tax model in different environments, we will follow in the footsteps of Graham (1996) when he tested the relationship between the firm's level of leverage and its marginal tax rate. The test states that if the tax model of capital structure theory is valid, the level of leverage should be positively correlated with the firm's MTR because MTR measures the size of the tax break the firm will get when it pays interest.

Considering tax Arab countries only, the level of leverage should increase when the firm's MTR increases. MTR is used here because it gives the net tax advantage of debt, as will be shown in the methodology in chapter V. The theoretical expectation is to find supporting evidence regardless of the environment in which the sample firms operate. However, it is the claim of this dissertation that due to the special environment in which the sample firms operate, theory may not behave as expected. However, if it does behave as expected then it is robust and portable across different environments. The Arab tax environment is different from the one considered in the theory. Following are some arguments to support this claim. First, Arab tax laws do not have loss carry backs. This is one of the components of MTR; hence, the Arab tax countries' MTR is different from the MTR in Western economies. Second, the data shows that Arab firms report low

profitability, if not loss. Accordingly, MTR is usually very small if at all it exists. Nevertheless, MTR is expected to be significant and positive when MTR is positive because firms will always try to capitalize on any savings opportunity. Finally, Antoniou, et al. (2002) argue that if tax rates are very high, then a good portion of the profits will be consumed by taxes, which leads firms to require external financing. Therefore, debt is expected to have a negative relationship with MTR. Since taxes are low or absent due to low or no profits, then MTR is –again expected to have a positive correlation with debt in Arab economies. This leads us to the second testable hypothesis of this dissertation:

H2: In Arab countries operating in a corporate tax regime, leverage is expected to be positively related to the marginal tax rate.

Testing the tax models of capital structure will not be complete without considering the DeAngelo and Masulis (1980) non-debt tax shield. In brief, NDTS is considered either as a substitute for DTS (see DeAngelo and Masulis 1980, Graham 1996 and Hovakimian, et al. 2001) or as a proxy for collateral (Bradley, et al. 1984, and Bathala, et al. 1994). If the tax model of capital structure is valid and robust in different environments, as the theory expects, Arab firms that operate in a tax regime will have a positive (sign of collateral argument) or negative (a substitution effect) NDTS coefficient. On the other hand, in non-tax Arab countries, NDTS will be positive (sign of collateral argument) or not significant since no taxes exist.

As mentioned in the analysis above, since most Arab firms do not report profits, one would expect low or no NDTS effect. Also, since Arab countries tax laws do not have loss carry backs, NDTS is expected to be smaller than that for a comparable firm in Western economies. These two facts show that NDTS has smaller effect on the firm's

level of debt than expected by theory. Moreover, since there are not enough profits for the firm to benefit greatly from debt interest, NDTS is not expected to be a substitute for DTS. At best it is expected to be a sign of collateral for lending banks. For non-tax Arab countries, NDTS cannot be considered a substitute for debt because debt has no tax considerations in these countries. Also, since NDTS does not offer any tax break in these countries, it is not expected to be of significance. However, the collateral argument lends NDTS some significance in non-tax Arab countries. This leads to the third hypothesis of this dissertation:

H3: In Arab countries, non-debt tax shields are expected to be positively related to leverage.

Another factor affecting capital structure is taxes on individuals. Personal taxes were neglected by MM (1963); hence they found that the gain from leverage is the entire DTS. Miller (1977) contends that the gain from leverage at the corporate tax level is fully exhausted at the personal tax level. DeAngelo and Masulis (1980) find a path in between. Nonetheless, from the discussion of this topic in chapter two, we find that higher personal tax rates lower the gain from leverage. Accordingly, tax models of capital structure theory expect leverage to be inversely related to personal taxes.

Due to the absence of taxes, non-tax Arab countries will not be considered in testing the personal tax model of capital structure. Tax Arab countries either do not tax dividends and capital gains or tax them at a lower level than interest income. Interest income is taxed at the investor's tax bracket. This tax preference to dividend income over interest income at the personal level should lower the level of leverage. The ability to test this prediction depends on the observability of cross-sectional differences in the personal tax advantage of the equity income relative to the debt income of the marginal

investor. Givoly, et al. (1992) state that the tax rates of the marginal investor in the firm's securities are not observable; hence, a proxy for the personal tax advantage of equity income relative to debt income exists in the form of the firm's dividend yield. Accordingly, leverage is expected to be negatively correlated with dividend yield. However, due to the Arab institutional factors, the above argument is not valid in the Arab world. Previous sections have shown that dividends carry other effects, some of these effects are:

- 1- La Porta, et al. (2000) show that in weak law countries (e.g. the Arab world), firms commit to paying higher dividends to attract investors to buy future stock issues. Consequently, since the target is future equity not debt financing, debt is expected to have an inverse relationship with dividend yield.
- 2- Since dividends are a commitment to equity holders, debt holders (banks) will view the firm unfavorably for future loans.
- 3- Equity is preferred over debt in the Arab culture; hence, more dividends lead to higher stock prices which in turn induce firms to capitalize on these prices by using equity financing, not debt financing.
- 4- The data show that Arab firms generate low profits; consequently, paying dividends consumes the better part of the firm's earnings. In fact Table 3.6 shows that some Arab firms' internal financing is negative, which means that, on average, these firms use some of the proceeds from external financing sources to pay dividends. Table 3.6 shows equity financing to be an Arab firm's first choice; therefore, higher dividends means higher equity not debt financing.

The fourth argument shows that Arab firms follow a reverse pecking order. For this reason, Arab firms raise equity, not debt, to finance excess dividends. If POH were

followed, then the ultimate capital structure would be the one that trades off the personal tax disadvantage of debt with the amount of harmful information the firm would dissipate by using external funding.

These effects are valid in both tax and non-tax Arab countries. Consequently, dividends, as they were used in Givoly, et al. (1992), will not serve our purposes here. An interaction between MTR and dividend payout ratio will isolate the effect of personal taxes on capital structure. Since MTR is zero for non-tax Arab countries, this interaction term is zero for these countries. Furthermore, the interaction will capture the effect of personal taxes in tax Arab countries only. Since investors prefer more wealth to less, we expect them to prefer dividend income (which is always taxed at a lower rate than interest income) to interest income unless they are compensated for this tax differential. However, this compensation makes debt financing more expensive to firms, and unless the corporate tax break overcomes this cost, firms will prefer equity financing to debt financing. Accordingly, debt is expected to have a negative relationship with this interaction term. Hence, we can develop the fourth hypothesis of this dissertation:

H4: In accordance with the personal tax model of capital structure, in tax Arab countries, firms with high dividend yields will use less leverage than firms with low dividend yields. Or, leverage is expected to have an inverse relationship with personal taxes in tax Arab countries.

There are other reasons for the use of debt beside the tax advantage. As mentioned earlier, the benefits of avoiding dilution of ownership (Leland and Pyle 1977), information asymmetry (Myers and Majluf 1984) and mitigating managerial agency conflict (Jensen and Meckling 1976) are some of the sufficient reasons for using debt. These benefits can be traded off with the costs of debt (e.g. financial distress) to

arrive at the optimal level of leverage. The following subsection develops the hypotheses to test the non-tax models of capital structure.

4.4.2.2 Agency Hypotheses:

As discussed in the literature review, agency is a two-legged conflict; a manager/shareholder leg and a shareholder/debt holder leg. Jensen and Meckling (1976) demonstrate that conflicts between shareholders and managers arise because managers hold less than 100% of the residual claim. Consequently, managers do not capture the entire gain from their profit enhancement activities, nor do they bear 100% of the costs of self-indulging activities. Hence, managers have the incentive to invest less effort in managing the firm's resources and may be able to transfer firm resources to their own personal benefit, e.g., by consuming more perquisites. Increasing the fraction of the firm's equity owned by the manager can mitigate such behavior. Leverage is another agency mitigating mechanism. Therefore, these two mechanisms are substitutes for one another (i.e. they are inversely related). Additionally, Bathala, et al. (1994) concluded that increased managerial ownership aligns interests of managers with the interests outside shareholders and reduces the role of debt as an agency mitigating mechanism. Friend and Lang (1988) demonstrated that since managers decrease their diversification when they invest in the firm they manage, they are hesitant to take on more debt. Thus leverage is expected to be negatively related to the manager's ownership in the firm.

As mentioned in Chapter III, managerial agency conflict in the Arab world is minimal; 95% of Arab firms are family owned and managed. Furthermore, the firms that are owned by the government or private institutions are managed by the families that own the majority of the remaining shares, (Swabini 2001). These facts minimize the

Manager/shareholder agency costs, which means they will offset a trivial amount of the benefits of debt. This calls for an elevated use of debt level. To avoid loosening their grip on the firm, the managers (i.e. the majority owners in the firm) want to avoid diluting their ownership by issuing equity. Thus, they will issue new debt instead. Additionally, government ownership in the firm is a sign of security to lenders. Antoniou, et al. (2002) suggest that if the government is an owner in firms, these firms are expected to have a higher level of debt because of the assurance effect the government has on the lenders and because of the lower probability of agency conflicts. This leads us to believe that:

H5: Due to the high concentration of ownership, agency conflict in Arab firms is minimal and the managers' control is substantial. Consequently, family and government ownership are positive determinants of capital structure.

Myers (1977) shows that highly leveraged firms are more likely to pass up profitable investment opportunities; therefore, firms with higher future growth should use less debt and more equity finance to mitigate this agency problem. He uses the market-to-debt ratio of equity as a proxy for growth. One can conclude that theory suggests an inverse relationship between leverage and growth. Rajan (1992) shows that the use of bank debt reduces agency costs, which will lower the significance of growth (i.e. market-to-book ratio) in determining the use of leverage. Rajan and Zingales (1995) show that the presence of large shareholders on the board reduces agency costs and if these large shareholders are banks, they may force the firm to increase its debt by borrowing from the owning bank. Antoniou, et al. (2002) suggest that in bank-based economies, the long term relationship between the firm and the lending bank, combined with the strong cooperation between the two in determining the firm's need for funds

And how to satisfy it, mitigates the agency conflict of debt and increases the borrowing capacity of the firm.

It has been established that the providers of debt capital in the Arab world are usually banks that have either strong ties with the owning family and a long-term relationship with the firm or are major partners in the firm. Banks also serve as members of the board and as advising committees to the firms that borrow from them. Banks grant loans to companies after these companies show the profitability of their capital budgets through professional feasibility studies. Finally, the family that owns the firm sometimes owns the lending bank. This minimizes the shareholder/debt holder agency costs. Consequently, agency conflicts are negligible and there is no need for the market of corporate control to exist for the purpose of taming such conflict, well, such markets do not exist in the Arab world. Hence, growth is not expected to cause agency conflicts.

Since Arab markets consider only the book values of the firm's assets when pricing its shares, then the market-to-book ratio is expected to be of no significance. However, the fact that Arab bond markets are limited weakens this argument. Also, the fact that the market-to-book ratio is low exaggerates the debt-to-market ratios. This in turn leads us to believe that the market-to-book ratio will not be significant in the debt-to-market ratio regressions. Nevertheless, because banks are informed lenders to the firm, any growth is expected to be well founded. Such growth means that the firm has good future prospects and is worthy to receive a loan. Expecting a positive relationship between leverage and growth, leads to the following testable hypothesis:

H6: In both tax and non-tax Arab countries, the level of debt is expected to be positively related with growth.

4.4.2.3 Country of Origin Hypothesis:

The above hypotheses lead to one of the most significant hypothesis of this dissertation. Thus far, we have established that institutional factors and country traditions are expected to affect the use of debt. Table 3.6. shows that 16% of the Arab countries firm financing is in the form of debt, compared to 25% in developed countries and 22% in developing countries. These differences are due to differences in institutional factors pertaining to each of these three categories. Therefore, the region of origin is expected to have a significant role in determining the level of debt a firm may use after controlling for all other determinants.

Singh and Hamid (1992) and Singh (1995) touched on the subject but never tested it. They claim that due to certain country-specific factors, it is expected that each country have a role in determining the level of debt. Booth, et al. (2001) test the null hypothesis that everything is institutional and that we can explain capital structure differences by knowing the nationality of a company. They found that up to 43% of the variation in the firm's debt is explained by the country of origin. The expectations of the above hypotheses are that country factors play an important role in financing decisions. Hence, these factors are expected to change the significance of the theory suggested determinants of capital structure. These country factors are also expected to introduce new determinants of capital structure, determinants that theory did not tackle. Since it is not the purpose of this dissertation to identify such determinants, they will be summed up in one factor - a country dummy variable. Identifying such determinants is left for future research.

H7: The country of origin is a significant determinant of capital structure in the Arab world.

4.4.2.4 Information Asymmetry Hypothesis:

Myers and Majluf (1984) demonstrate that if management has favorable inside information, and it acts in the best interest of the existing shareholders, then management will refuse to issue shares even if it means passing up positive NPV projects, because the loss in existing stock price (due to the issuance of new stock) might outweigh the project's NPV. On the other hand, passing up positive NPV projects is contrary to wealth maximization. To get out of this trap, issuing debt is in order if internal resources are not sufficient to take on the positive NPV investment projects because they both (external debt and internal funds) are not information-revealing sources of funds and involve no undervaluation due to any information asymmetry. Accordingly, investments are to be financed in that order. This conclusion is called the pecking order hypothesis (POH) of Myers and Majluf. Myers (1984) compares POH with STO and finds that neither is able to strongly explain capital structure policies, and a mix of both may lead to the optimal capital structure decisions.

Singh and Hamid (1992) and Singh (1995) show that developing countries follow a reverse pecking order in their financing patterns. They explain this finding by the institutional factors of these countries. Arab countries have similar characteristics to those of developing countries and are also expected to follow a reverse pecking order. Following are some of the reasons that support this claim:

- 1- The trend of continuous increase of stock prices in Arab stock markets throughout the nineties yielded high capital gains to investors and lowered the cost of equity finance to firms.
- 2- Arab governments sponsor stock markets and encourage investing in these markets in many ways. Arab governments use these markets to trade stocks they

own and utilize them to privatize their companies as part of their International Monetary Fund (IMF) and World Bank for Reconstruction and Development (WBRD) policies to reconstruct their respective economies. Moreover, Arab governments give tax incentives to equity trading and have solid securities and security markets laws to encourage foreign investors.

- 3- Capital gains and dividend income are both tax free at the personal level while interest income is taxed at the personal tax bracket level of the investors.
 - 4- As mentioned earlier, debt is not attractive in the Arab culture due to religious beliefs and cultural doctrines such as the mandate to help others, family and institutional ownership and the exchange of favors combined with the tendency to use informal borrowing to hide the volume of work for taxes and secrecy in conducting business.
 - 5- The weakness of the bond primary market and the absence of a debt secondary market combined with the restrictive bank loan provisions.
 - 6- It is mandatory to service debt by the obligation to meet timely payment compared to the relatively more lenient dividend policies and obligations.
- Moreover, the data shows that Arab firms report losses or highly volatile and relatively low earnings, which is not a healthy prerequisite for the use of debt, which requires stable stream of cash inflows.

These reasons made equity financing more attractive than debt financing. Finally the fact that Arab firms do not generate enough profits to retain and use to finance growth, combined with the fact that they need funds to pay dividends to build the reputation to be able to market future equity issues (the Laporta, et al. (2000) argument) makes it hard for these firms to use retained earnings to finance growth. This leads to the

last hypothesis of this dissertation.

H8: Due to country traditions and institutional factors, Arab firms follow a reverse pecking order in their financing patterns.

Finding evidence to support these hypotheses means that capital structure theory is neither robust nor portable across different environments. This concludes the development of the hypotheses. The next chapter contains a detailed explanation of the data and methodology used in testing these hypotheses.

Table 4.1

Summary of the Measures of Capital Structure and their Interpretations.

Variable	Interpretation
LTDMV, LTDBV	Long-term debt divided by the market and book value of equity respectively
STDMV, STDBV	Short-term debt divided by the market and book value of equity respectively
TDMV, TDBV	Total debt divided by the market book value of equity respectively

Table 4.2

Summary of the Determinants of Capital Structure and their Interpretations.

Explanatory Variable	Interpretation	Indication
MTR	Marginal tax rate	Effect of corporate taxes
NDTS	Non debt tax shield	Substitute to tax shield
DIVNI	Payout ratio	Character
MTRDIV	Interaction between the marginal tax rate and the payout ratio	Effect of personal taxes
MB	Market-to-book ratio	Growth, financial distress
GOV	Government ownership	Ownership structure
FAM	Family ownership	Ownership structure/Agency
TANTA	Tangible assets divided by total assets	Collateral
INTANTA	Intangible assets divided by total assets	Collateral, cost of financial distress, reputation
LNS	Natural log of sales	Size
SDOE	Standard deviation of earnings	Volatility, business risk
EBITTA	Earnings before interest and taxes divided by total assets	Profitability

Table 4.3

A Summary of the Effects of the Arab Country Traditions and Institutional Factors on the
Suggested Determinants of the Various Ratios of Debt

Explanatory Variable	All Arab Countries	Tax Countries	Non-tax Countries
MTR	+	+	0
NDTS	+/-	+/-	0
DIVNI	-	-	-
MB	+	+	+
GOV	+	+	+
FAM	+	+	+
TANTA	+	+	+
INTANTA	+	+	+
LNS	+	+	+
SDOE	0/-	0/-	0/-
EBITTA	-	-	-

CHAPTER V

DATA AND METHODOLOGY

5.1 Introduction

The empirical literature so far has failed to produce a detailed test of the effects of institutional factors on both the level of leverage and its determinants. It also failed to test the determinants of capital structure in economies that do not have a tax system in place. As a result, some testable hypotheses for an empirical analysis of these issues were developed in Chapter IV. These testable hypotheses are:

H1: *Arab countries with a corporate tax regime are expected to have higher leverage than countries with no corporate taxes.*

H2: *In Arab countries operating in a corporate tax regime, leverage is expected to be positively related to the marginal tax rate.*

H3: *In Arab countries, non-debt tax shields are expected to be positively related to leverage.*

H4: *In accordance with the personal tax model of capital structure, in tax Arab countries, firms with high dividend yields will use less leverage than firms with low dividend yields. Or, leverage is expected to have an inverse relationship to personal taxes in tax Arab countries.*

H5: *Due to the high concentration of ownership, agency conflict in Arab firms is minimal and the managers' control is substantial. Consequently, family and*

government ownership are positive determinants of capital structure.

H6: In both tax and non-tax Arab countries, the level of debt is expected to be positively related to growth.

H7: The country of origin is a significant determinant of capital structure in the Arab world.

H8: Due to country traditions and institutional factors, Arab firms follow a reverse pecking order in their financing patterns.

These hypotheses are tested using two different methodologies. The first methodology examines the hypotheses through cross-sectional analysis to find the ability of the suggested explanatory variables to verify or negate these hypotheses. The second methodology uses descriptive statistics and summaries to test the eighth hypothesis. The reason for not using the traditional testing techniques in hypothesis 8 is due to short time series data that is not likely to produce any reliable results. Shyam Sunder and Myers (1999) state that when the test is based on 3-5 years, the coefficients do not exhibit significant even when they are significant. Consequently, the eighth hypothesis will be tested using descriptive statistics.

The variables used in this dissertation are divided into two main sets. The first set is six dependent variables to test the robustness of the results and to probe the different determinants for the different kinds of debt. The second set is the group of independent variables that were selected according to theory and other empirical research in an effort to isolate the effect of institutional factors on the level of leverage used by the firm.

This has been a broad overview of the data and methodology to be used to perform the empirical analysis in this dissertation. The following two sections look at the data and the methodology in more detail.

5.2 Data

Collecting the data was one of the most challenging and time-consuming parts of this dissertation. There exists no set of ready data (as those of Compustat and CRSP) in the Arab world. No form of data bank is available and the Compustat Global Vantage had from 0 to 5 companies in each Arab country slot; moreover these companies were mostly empty of any usable data. The data is unique in many respects. First, it is the first database in the Arab world to include the data needed to test capital structure and other financial issues. Second, it is the first data set from economies that do not have a tax system in place. Third, though from less developed countries, it is reliable because of the reliability of its sources and because of the enforcement by the respective governments of international accounting standards for reporting and for tax purposes wherever tax apply. Finally, analyzing each financial statement individually, each observation was recorded, calculated, and filtered with great care and according to the required standards of data recording and filtering.

5.2.1 The Sample

The sample includes cross-section time series data on the various measures of leverage and the suggested determinants of capital structure for the Arab countries included in these tests. The criteria for inclusion in the sample is that the country must be an Arab country (a member of the Arab league, to insure homogeneity in country traditions and institutional factors), have a stock market, and be included in more than one data source to be able to verify the available data and to lengthen the time series as much as possible. For example, as we will see shortly, some data sources cover different periods of time (Shuaa' Capital covers 1996-1999 and Alshabaca covers 1998 – 2001).

The criteria for including a company in the data set are that it have the needed financial statements to extract the required observations, that it be non-financial, domestic (because foreign companies have special tax arrangements and have different sources of financing that will have a vast effect on their capital structure decisions) and listed in its country's stock market. This will bias our data towards the largest companies. However, this bias is more beneficial than harmful, because large companies are the ones that are expected to have reliable financial statements.

The data were extracted from financial statements found at Arab markets websites; some were requested from companies themselves, and sometimes they were obtained through personal contacts, especially in Palestine and Jordan. However, most of the financial statements were acquired from private and state-sponsored sources like Shuaa' Capital, a private financial institution in UAE (a securities firm -- brokerage and investment banking) and Alshabaca (an information-based institution that was established by the Union of Arab Stock Exchanges to provide information and services to the financial market community within the Arab world), the Arab Monetary Fund, and the International Finance corporation and other published works.

Since these statements did not follow a consistent format, ratios and other pieces of information had to be calculated and extracted through a time consuming and repetitive process, one at the time, and with great care.

The data covers the period 1996-2001 for the listed non-financial companies in the stock markets of Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia and UAE. A total of 12 countries, 461 companies and 1115 company years (1 to 5 years per firm) worth of data were collected. Table 5.1 gives a description of the sample. Information for companies that did not have complete

records was acquired from different sources. In other words, some data were collected from more than one source. Whenever there was a match on the other pieces of data from the various sources, the new (missing) pieces of data were accepted. Summary statistics of the variables used in the models are presented in Table 5.2. Table 5.3 shows the pairwise correlation matrix for all the variables. The correlation matrix does not suggest any serious concerns for multicollinearity problems. This is further confirmed in the results Tables of Chapter VI; the Variance Inflation Factor (VIF) is always less than five.

5.2.2 Accounting Standards and Data Reliability

Currently all Arab countries have societies that certify accountants. These societies are members of both the International Federation of Accountants (IFAC) and the Arab Society of Certified Accountants (ASCA) (ASCA electronic report 2002). The accounting profession in the Arab world has two main characteristics. First, it is improving continuously due to governmental support and the evolution of stock markets. The ASCA has been developing the accounting profession continuously since 1984 through establishing the society's certifying institute; translating, explaining, and publishing the international accounting standards; and through periodical consortiums and journal publications on the accounting profession and how to improve it in the Arab world. The ASCA's credibility stems from its works and its support from the Arab public, and educational and private institutions. Additionally, the ASCA is a member of the following international societies and committees: International Federations of Accountants (IFAC), International Accountants Standards Committee (IASC), International Audit Practices Committee (IAPC), and the UN Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR). Also,

the ASCA is represented on the Board of the UN Economic and Social Council.

The second characteristic of the accounting profession in the Arab world is its compatibility with the economic and legal developments in the Arab world. The number of certified accountants who use the international and local standards is continually increasing. The countries' governments are producing new legislation and amending existing laws according to developments in the accounting standards especially in the areas of securities, companies, stock markets, and tax laws. These laws require businesses to keep accounting books and records, release periodic financial statements and have these statements audited by licensed auditors and according to the international and local accounting standards (Price Waterhouse 1990, and the ASCA 2002).

The fact that the accounting profession in the Arab world follows the international accounting standards and that businesses are legally required to use accounting standards for reporting and auditing give the data the needed reliability to form the basis for this dissertation's empirical tests.

5.2.3 Data problems

The fact that the data is a cross-section time series prompted testing for both heteroscedasticity and autocorrelation. The Breusch-Pagan/Godfrey test confirmed heteroscedasticity, which is blamed on the cross-sectional nature of the data. Most of the explanatory variables were significant when regressing the variance of the error term on these variables. The data was tested for autocorrelation by using the Durbin-Watson test. The results show that the disturbances are autocorrelated. Since these two problems cause the loss of the efficiency property of OLS and invalidates statistical tests, OLS (though unbiased) is ruled out as an estimation technique.

The dependent variable –the level of debt- suffers from the limited dependent variable problem; since it can take only certain values, it is truncated. Truncated outcomes are those where observations are not sampled at the lower range of values (left truncation), upper range of values (right truncation), or both. In other words, the truncated outcome results when respondents at the lower or upper range of values are excluded from the sample. The dependent variable is defined as the book value of debt (total, long or short term) divided by the value (book or market) of equity. This definition limits the values that the dependent variable can take to be between zero and 1 and in extreme cases this value can be a little larger than 1. These limitations occur because the level of debt can never be negative (unless the firm is 100% equity financed and invests some of its profits in long-term loans to others, which conflicts with the profit maximization theory of the firm's objective) and because a firm's use of debt is limited to a certain percentage of its equity since the last is used as a collateral on the debt or as a measure for debt capacity. Greene (1997) shows that, by construction, the error term of the truncated model has a zero mean but it is heteroscedastic. Thus, using OLS will cause the loss of both efficiency and unbiasedness. Truncated dependent variables can be analyzed with truncated regression. One goal of the truncated regression model (Maximum likelihood) is to estimate the relation between a predictor, i.e. the determinants of capital structure, and the truncated outcome, i.e. total book-debt-ratio, in the population where the dependent variable can take only certain values. Truncated regression will produce slopes and standard errors that are less biased and more efficient than those obtained from OLS regression. In other words, it increases the level of significance of the estimated means.

Data was collected from 12 countries that use similar accounting and recording standards. However, these countries have minor differences in the layout of the financial

statements. These differences may also exist within a given country. Some of the financial statements group variables in one entry; an example would be aggregating all financial expenses in one category. Such aggregation causes gaps in the data. Despite the fact that in general, aggregating companies were dropped from the data set, in very narrow cases, some were still included because of the scarcity of data in some countries. As mentioned earlier, multiple sources were used to collect the data and what was missing in one source was found in another so that the number of missing observations was minimal. Considering the fact that missing observations in the dependent variable may cause a loss of unbiasedness and efficiency, all the companies that had missing dependent variables were dropped from the sample. Missing observations in the independent variables were noted by a dot. Again, since the number of cases is minimal, no averages were filled and the regressions were left to have lower degrees of freedom rather than tampering with the data in any way. The missing observations minimally lower the efficiency of the estimates and decrease their level of significance. However, since these missing observations are not numerous, no major loss of efficiency is expected and the significance should not be affected considerably, i.e. it is not expected to cause a significant factor to become insignificant. Moreover a range of significance levels will be given in the results chapter; these levels range from 1 to 10%.

As is the case in most data, some outliers were encountered. Outliers were detected by ordering data points in an ascending/descending manner, visually and by using the SAS MEANS and UNIVARIATE procedures. Most of the variables are normalized by factors like equity value or total assets. Usually, these ratios do not exceed unity; however, due to data problems, in very limited cases, they do. To avoid this problem the upper and lower 1% of the data were dropped.

The fact that the data is a cross-section time series creates random effects. The sample firms have 1-6 time series observations for each variable; this causes the random effects problem. Consequently, OLS will not be sufficient to capture these random effects.

Finally, despite all these limitations, accounting data are often the only basis that outside investors have to make judgments about comparative corporate performance. Though at a fairly high level of development, accounting standards in Arab countries are expected to continue to improve over time due to the opening of their markets for foreign investors as part of the IMF and WBRD-imposed economic restructurings.

5.3 Methodology

The methodology is designed to test the hypotheses using techniques that take the above stated data problems into account. The following is a discussion of variable calculations, data testing methods, models, and estimation techniques.

5.3.1 Variable calculations

As stated earlier the dependent variables use the book value of the firm's debt because most debts are in the form of long-term bank loans and a secondary bond market does not exist. The debt book values are both short and long term and are divided by both the market and book values of equity. As shown in Table 4.2, the majority of the explanatory variables are simple financial ratios. However, a few of them require additional explanation. Depending on the availability of data, two methods are used to calculate the NDTs. The first is adopted from Graham (1996) and is given in equation 5.1:

$$NDTS = \frac{NOL + DEP + ITC}{TA} \quad (5.1)$$

where

NDTS = non-debt tax shield,

NOL = net operating losses,

DEP = depreciation,

ITC = investment tax credit, and

TA = total assets.

Investment tax credit is calculated as in equation 4.2:

$$ITC = CAPEXP * (1 - STR) \quad (5.2)$$

where

ITC = investment tax credit,

CAP EXP = capital expenditure, and

STR = statutory tax rate.

The second method is adopted from Titman and Wessels (1988):

$$NDTS = EBIT - INTEXP - \frac{TAX}{STR} \quad (5.3)$$

where

EBIT = earnings before interest and taxes,

INT EXP = interest expense, and

TAX = paid taxes.

The marginal tax rate is calculated as in Graham (1996) and Antoniou, et al. (2002). It is equal to the taxes paid on an additional dollar of income after accounting for non-interest tax deductions like investment tax credit, depreciation, and losses. MTR

equals the actual taxes paid divided by EBIT.

5.3.2 Data Tests

Using the Breusch-Pagan/Godfrey test for heteroscedasticity, the data was found to be heteroscedastic. The Durbin-Watson test for autocorrelation showed that the disturbances are autocorrelated. The SAS Variance Inflation Factor was used to test for multicollinearity; none of the determinants exceeded 5, which means that no severe multicollinearity is found. Country dummy variables have VIF that are greater than five which is an indication of the similarities among Arab countries. Other data problems were deduced from the nature of the variables being tested. SAS PROC MEANS and PROC UNIVARIATE confirmed these problems.

5.3.3 Estimation Techniques

To deal with these problems and to retain all the desired regression properties, four estimation techniques were used. The first estimation technique uses OLS implemented through SAS PROC REG. The second uses maximum likelihood implemented through SAS PROC MIXED with fixed and random effects, and heteroscedasticity treatment. The third TOBIT truncated data model implemented through PROC LIFEREG. The fourth uses maximum likelihood with heteroscedastic TOBIT and random effects implemented through SAS PROC NLMIXED. The heteroscedastic TOBIT results are presented and analyzed because TOBIT is the one model that copes with the problems inherent in the data sample. The OLS results are presented and compared to those of the TOBIT model. The results are found to be robust regardless of the estimation technique; the directions and levels of significant are comparable across

the estimation methods.

The results are compared with the predicted signs in Table 4.3 to test the effects of country traditions and institutional factors on both the aggregate level of leverage and on its determinants. The results are also compared to those for Western economies to test the applicability of the theory of capital structure in the Arab world, an environment that is different from that in which the theory was developed.

5.3.4 Methodology to Test the Hypotheses

On the basis of the static tradeoff model in deciding the firm's capital structure, linear regressions that include the theory and empirical determinants of capital structure are the appropriate methodology. Cross-section time series models are used; the dependent variable is the debt ratio and the theory and empirically suggested determinants of capital structure are the explanatory variables. Accordingly, the empirical model is expressed as:

$$\frac{D_{i,t}}{V_{i,t}} = \beta_0 + \sum_{i=1}^n \beta_i X_{i,j,t} + \varepsilon_{i,t} \quad (5.4)$$

Six equations, one for each of the six dependent variables, are proposed. The suggested determinants of capital structure are the regressors in these equations. Collateral, size, business risk, and profitability are the control variables. The remaining regressors test the effect of taxes, agency costs, informational asymmetry, and the country of origin, which capture the independent influence of the institutional factors and country traditions. The regressors' magnitudes, directions and levels of significance are compared with those in the empirical tests in Western economies. This regression equation is estimated by using the estimation techniques mentioned earlier.

5.3.4.1 Empirical Models to Test the Hypotheses

The first hypothesis suggests that firms operating in tax Arab countries will utilize more debt than those in non-tax Arab countries. Using DTAX -a dummy variable that has a value of one if the company is in a tax country and zero otherwise- captures the effect of taxes on corporate capital structure. The specification of the regression equation is given in equation 5.5.

$$\begin{aligned} \frac{D}{E} = & \beta_0 + \beta_1 DTAX + \beta_2 MTR + \beta_3 NDTs + \beta_4 MB + \beta_5 DIVNI + \\ & \beta_6 MTRDIV + \beta_7 FAM + \beta_8 GOV + \beta_9 TANTA + \beta_{10} INTANTA + \\ & \beta_{11} LNS + \beta_{12} SDOE + \beta_{13} EBITTA + \varepsilon \end{aligned} \quad (5.5)$$

D/E represents the six debt ratios presented in Table 4.1; the independent variables and the expected signs of their coefficients are presented in Tables 4.2 and 4.3. The model does not control for the country of origin effect to avoid the trap of perfect multicollinearity that occurs when the country dummy variables are added to the tax dummy variable.

The second hypothesis tests the effect of the marginal tax rate on the level of leverage in Arab countries. This regression controls for the effect of the country of origin on the level of debt. The empirical equation to test this hypothesis is given in equation 5.6.

$$\begin{aligned} \frac{D}{E} = & \beta_0 + \beta_1 MTR + \beta_2 NDTs + \beta_3 MTRDIV + \beta_4 DIVNI + \beta_5 MB + \\ & \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \beta_{10} EGYPT + \\ & \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \beta_{14} DOMAN + \\ & \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \beta_{18} DUAE + \\ & \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \beta_{23} EBITTA + \varepsilon \end{aligned} \quad (5.6)$$

Equation 5.6 is similar to equation 5.5; however, the tax dummy variable is

Omitted and the country dummy variables are added. To avoid the perfect multicollinearity trap, Tunisia is the excluded country dummy variable.

The third hypothesis suggests that the NDTs is positive in the Arab countries with no or low significance. The NDTs variable in equation 5.6 captures the effect of NDTs on the firm's level of leverage. To separate the effect of NDTs in tax countries from that in non-tax countries a DNTAX variable is introduced. DNTAX is non-tax dummy variable that has a value of one if the country is a non-tax Arab country and zero otherwise. Similarly, DTAX is a dummy variable equal to 1 if the Arab country is a tax country and 0 otherwise. NDTs*DTAX interaction term captures the effect of NDTs in tax Arab countries while the NDTs*DNTAX captures the effect of NDTs in non-tax Arab countries. The regression model to test this difference appears in equation 5.7. To avoid the perfect multicollinearity trap, Tunisia is the excluded country dummy variable.

$$\begin{aligned} \frac{D}{E} = & \beta_0 + \beta_1 NDTs * DTAX + \beta_2 NDTs * DNTAX + \beta_3 MTR + \beta_4 DIVNI + \\ & \beta_5 MB + \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \\ & \beta_{10} EGYPT + \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \\ & \beta_{14} DOMAN + \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \\ & \beta_{18} DUAE + \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \\ & \beta_{23} EBITTA + \varepsilon \end{aligned} \quad (5.7)$$

The interaction between the marginal tax rate and dividend payout ratio is used to capture the effect of personal taxes on capital structure in the countries that levy taxes. This methodology will enable us to isolate the other effects of dividends on capital structure, especially in non-tax Arab countries. The effects of dividends can be seen in any of the above models. However, we use equation 5.6 to discuss the fourth hypothesis by relating personal tax effects (proxied by dividend yield) to leverage.

Figure 5.1 illustrates the difference between the effects of dividends in both tax and non-tax Arab countries and the effects of personal taxes on capital structure. The last column shows the effect of personal taxes on leverage. The effect is negative in tax Arab countries because the personal taxes on interest income are always higher than that on dividend income. On the other hand, it has no effect in non-tax Arab countries because there are no personal taxes. We test the personal tax effect by interacting dividend yield with MTR. The coefficient of this interaction should be negative.

Hypothesis 5 points out that concentration of ownership calls for increased use of debt. The proxies for this concentration are family and government ownership. This Hypothesis will be tested while controlling for the variables of the other hypotheses. The regression model in equation 5.6 will serve this purpose.

Hypothesis 6 tests the effect of the agency conflict between debt holders and shareholders on the firm's leverage. Growth is the proxy for this conflict. Again, equation 5.6 will be utilized to test this hypothesis.

Hypothesis 7 claims that controlling for all the variables that theory and empirical works suggest that they would have an effect on capital structure is not enough. There are other factors that are specific to these countries that play a role in determining the firm's level of leverage. It is not the purpose of this dissertation to identify these factors; hence, they are summed in one factor, a country dummy variable. Equation 5.6 is used to test the significance of these dummy variables when controlling for other variables. Equation 5.8 presents the model to test the significance and explanatory power of these factors by themselves.

$$\begin{aligned} \frac{D}{E} = & \beta_0 + \beta_1 DBAHRAIN + \beta_2 DJORDAN + \beta_3 EGYPT + \beta_4 DKUWAIT + \\ & \beta_5 DLEBANON + \beta_6 DMOROCCO + \beta_7 DOMAN + \beta_8 DPALESTINE + \\ & \beta_9 DQATAR + \beta_{10} DSAUDI + \beta_{11} DUAE + \varepsilon \end{aligned} \quad (5.8)$$

Hypothesis 8 suggests that Arab firms follow an exact reverse pecking order. Country traditions and institutional factors are assumed to be the motive for such financing behavior as explained in chapters three and four. The methodology to test this hypothesis uses simple summary statistics of financing patterns as shown in Table 3.6. Again for the reasons mentioned earlier (the availability of a short data set of 3-6 years and Shyam Sunder and Myers (1999) statement that when 3 - 5 year time series data are used, the coefficients are not significant) regressions to test the POH will not be used and will be left for further research.

Table 5.1

Country-Company Data Summary

Country	Company-years in sample	Companies in sample	Total listed companies	Financial companies
Jordan	401	141	161	78
Bahrain	56	19	41	21
Tunis	13	9	44	35
Saudi	176	62	75	14
Oman	69	52	131	44
Kuwait	133	65	86	32
Lebanon	12	5	13	7
Egypt	158	69	1071	372
Morocco	3	1	55	14
Palestine	12	6	23	10
Qatar	19	9	22	12
UAE	63	23	35	17
Total	115	461	1757	656

Table 5.2

Summary Statistics for Consolidated Arab Countries Data

Variable	N	B	STDV	MIN	MAX
Independent Variables					
GOV	564	0.16	0.22	0.00	0.75
FAM	570	0.44	0.21	0.00	0.66
TANTA	1094	0.41	0.26	0.00	0.96
INTANTA	1109	0.04	0.14	0.00	1.01
NDTS	1059	0.04	0.09	0.00	0.92
LNS	1073	16.70	2.17	6.90	22.75
SDOE	624	0.44	0.43	0.00	1.98
EBITTA	1053	0.10	0.14	0.00	1.76
MTR	1105	0.07	0.20	0.00	1.67
MB	1087	1.40	1.42	0.00	11.67
DIVNI	1065	0.28	0.42	0.00	2.82
MTRDIV	1011	0.02	0.05	0.00	0.56
Dbahrain	1115	0.05	0.22	0.00	1.00
Degypt	1115	0.14	0.35	0.00	1.00
Djordan	1115	0.36	0.48	0.00	1.00
Dkuwait	1115	0.12	0.33	0.00	1.00
Dlebanon	1115	0.01	0.10	0.00	1.00
Dmorocco	1115	0.00	0.05	0.00	1.00
Doman	1115	0.06	0.24	0.00	1.00
Dpalestine	1115	0.01	0.10	0.00	1.00
Dqatar	1115	0.02	0.13	0.00	1.00
Dsaudi	1115	0.16	0.36	0.00	1.00
Dtunisia	1115	0.01	0.11	0.00	1.00
DUAE	1115	0.06	0.23	0.00	1.00
Dtax	1115	0.47	0.50	0.00	1.00
Dependent Variables					
TDBV	1078	0.32	0.56	0.00	2.98
TDMV	1059	0.30	0.53	0.00	2.81
LTDBV	1081	0.23	0.45	0.00	2.64
LTDMV	1067	0.22	0.43	0.00	2.79
STDBV	1103	0.12	0.34	0.00	2.82
STDMV	1085	0.11	0.34	0.00	2.78

Table 5.3

Correlation Matrix for Variables used in Models

	GOV	FAM	TANTA	INTANTA	NDTS	LNS	SDOE	EBITTA	MTR	MB	DIVNI	MTRDIV
GOV	1.00											
FAM	-0.74	1.00										
TANTA	-0.07	0.03	1.00									
INTANTA	0.14	-0.15	-0.22	1.00								
NDTS	-0.12	0.10	0.09	-0.09	1.00							
LNS	0.05	-0.01	-0.12	0.07	-0.06	1.00						
SDOE	-0.05	0.00	0.03	0.02	-0.06	-0.17	1.00					
EBITTA	-0.07	0.05	-0.08	-0.07	0.38	0.13	-0.19	1.00				
MTR	0.00	0.06	0.09	-0.03	0.19	0.18	0.00	0.01	1.00			
MB	0.03	-0.04	-0.05	-0.02	0.04	0.18	-0.09	0.18	0.06	1.00		
DIVNI	-0.04	0.00	-0.16	-0.06	0.00	0.24	-0.15	0.10	0.00	0.17	1.00	
MTRDIV	-0.01	-0.09	-0.10	-0.09	0.08	0.15	-0.12	0.07	0.10	0.17	0.48	1.00
TDBV	-0.05	0.17	0.11	0.06	0.12	0.24	-0.01	-0.03	0.53	0.08	-0.09	-0.08
TDMV	0.01	0.12	0.12	0.06	0.02	0.15	-0.03	-0.11	0.36	-0.06	-0.13	-0.12
LTDBV	-0.03	0.11	0.17	0.06	0.07	0.23	0.01	-0.04	0.36	0.08	-0.12	-0.08
LTDMV	-0.01	0.08	0.18	0.07	-0.02	0.11	0.00	-0.11	0.21	-0.07	-0.17	-0.11
STDBV	-0.03	0.13	-0.03	0.00	0.09	0.11	-0.02	-0.01	0.41	0.09	0.01	0.00
STDMV	-0.01	0.13	-0.02	0.03	0.07	0.11	0.00	-0.06	0.34	-0.05	-0.01	-0.03
Dbahrain	0.04	-0.11	-0.01	-0.03	-0.12	0.12	0.11	-0.05	-0.08	0.07	0.02	-0.09
Degypt	0.11	-0.12	0.10	0.04	-0.10	0.08	-0.03	-0.05	-0.02	-0.03	-0.15	-0.13
Djordan	-0.04	0.02	-0.12	0.15	-0.09	0.03	0.03	0.11	-0.02	0.02	0.04	-0.13
Dkuwait	-0.04	0.07	0.12	-0.12	0.08	-0.27	0.07	-0.09	-0.04	-0.10	-0.08	-0.04
Dlebanon	-0.07	0.08	0.15	-0.03	0.01	-0.11	0.02	-0.03	-0.02	-0.06	-0.04	-0.02
Dmorocco	-0.05	0.06	0.07	-0.02	0.02	-0.02	-0.01	0.00	-0.01	-0.02	0.05	0.08
Doman	0.06	-0.05	0.12	-0.08	0.09	-0.17	0.09	-0.06	0.05	-0.03	0.02	0.13
Dpalestine	-0.03	0.04	0.06	-0.03	0.03	-0.10	0.02	-0.02	0.00	-0.05	-0.07	-0.04

Table 5.3 (Continued)

	GOV	FAM	TANTA	INTANTA	NDTS	LNS	SDOE	EBITTA	MTR	MB	DIVNI	MTRDIV
Dqatar	0.01	0.01	0.01	-0.04	0.07	0.01	0.05	-0.04	0.05	0.01	0.00	0.06
Dsaudi	-0.05	0.05	-0.09	0.02	0.19	0.19	-0.14	0.06	0.16	0.08	0.12	0.25
Dtunisia	-0.05	0.07	-0.11	-0.03	0.00	0.05	-0.06	0.01	-0.04	0.05	0.06	0.19
DUAE	0.02	0.00	-0.11	-0.05	-0.11	0.01	-0.12	0.05	-0.08	-0.01	0.03	-0.03

Table 5.3 (Continued)

	TDBV	TDMV	LTDBV	LTDMV	STDBV	STDMV	Dbahrain	Degypt	Djordan	Dkuwait	Dlebanon	Dmorocco
TDBV	1.00											
TDMV	0.68	1.00										
LTDBV	0.84	0.57	1.00									
LTDMV	0.61	0.80	0.69	1.00								
STDBV	0.56	0.44	0.20	0.18	1.00							
STDMV	0.46	0.57	0.17	0.21	0.71	1.00						
Dbahrain	-0.01	-0.06	0.02	-0.04	-0.06	-0.07	1.00					
Degypt	-0.05	-0.04	-0.03	-0.01	-0.10	-0.08	-0.09	1.00				
Djordan	0.02	0.03	0.02	0.05	0.01	-0.02	-0.17	-0.31	1.00			
Dkuwait	-0.09	-0.06	-0.06	-0.04	-0.09	-0.09	-0.08	-0.15	-0.28	1.00		
Dlebanon	-0.03	0.02	-0.02	0.03	-0.03	-0.02	-0.02	-0.04	-0.08	-0.04	1.00	
Dmorocco	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.04	-0.02	-0.01	1.00
Doman	-0.03	0.02	-0.02	0.02	0.04	0.05	-0.06	-0.10	-0.19	-0.09	-0.03	-0.01
Dpalestine	-0.03	-0.03	-0.02	-0.02	-0.04	-0.03	-0.02	-0.04	-0.08	-0.04	-0.01	-0.01
Dqatar	-0.01	0.04	0.00	0.04	0.00	0.00	-0.03	-0.05	-0.10	-0.05	-0.01	-0.01
Dsaudi	0.19	0.12	0.10	0.02	0.20	0.23	-0.10	-0.18	-0.33	-0.16	-0.05	-0.02
Dtunisia	0.02	0.07	0.00	0.04	0.12	0.06	-0.02	-0.04	-0.08	-0.04	-0.01	-0.01
DUAE	-0.07	-0.10	-0.04	-0.09	-0.07	-0.07	-0.06	-0.10	-0.18	-0.09	-0.03	-0.01

Table 5.3 (Continued)

	Doman	Dpalestine	Dqatar	Dsaudi	Dtunisia	DUAE
Doman	1.00					
Dpalestine	-0.03	1.00				
Dqatar	-0.03	-0.01	1.00			
Dsaudi	-0.11	-0.05	-0.06	1.00		
Dtunisia	-0.03	-0.01	-0.01	-0.05	1.00	
DUAE	-0.06	-0.03	-0.03	-0.11	-0.03	1.00

Figure 5.1
An Illustration of the Role of Personal Taxes in Determining Firm Capital Structure

		Corporate Taxes	Personal Taxes on Dividends	Personal Taxes on Interest	Effect	Net effect on Leverage
Arab Tax Countries	Yes		Yes*	+***	+ -	-
			No**	+	+ -	-
Non-Tax Arab Countries	No		No	0	0	0
			No	0	0	0

* Lebanon and Jordan

** Egypt, Morocco, Oman, Palestine, Qatar and Tunisia

*** The positive and higher personal taxes on interest income makes debt a less desired form of investment for individual investors which in turn have a negative effect on the firm's level of leverage.

CHAPTER VI

EMPIRICAL RESULTS

6.1 Introduction

Capital structure theory was developed in Western economies that have a unique environment (i.e. country traditions and institutional factors). The focus of this dissertation is to test capital structure theory in the business environment of the Arab world. The hypotheses developed in Chapter IV are tested using the data and methodology in Chapter V. The results are presented in two sections. The first presents the results for the hypotheses in four subsections: tax models, agency models, country of origin model, and information asymmetry (POH) model, respectively. The second section presents the results for the control variables: collateral, volatility, size and profitability. The implications of the theory and empirical evidence are mentioned briefly in this chapter, because they have been presented and analyzed extensively in previous chapters. The findings are compared with those in developed and developing countries to arrive at a conclusion on whether capital structure theory holds in the Arab environment.

6.2 Hypothesis test results

The results for the tests of the hypotheses are discussed in the following subsections. The first presents and analyzes the results for the tests of the tax models of capital structure theory (hypotheses one to four). The second subsection presents the

results for agency models (hypotheses five and six). The third presents the results for the undefined country-specific factors role in determining the firm's capital structure (hypothesis seven). Finally, the fourth subsection presents the results for testing the role of information asymmetry and the Pecking Order Hypothesis in the Arab world (hypothesis eight).

6.2.1 Results for the Tax Hypotheses:

Tax theory of capital structure is presented in four different models; each examines an aspect of this theory. The first model tests the general effect of taxes on leverage (hypothesis 1). The second deals with the role of the marginal tax rate as a proxy for tax subsidy on interest paid (hypothesis 2). The third focuses on the role of non-debt tax shields, whether they are a substitute for debt tax shields or a proxy for greater debt capacity (hypothesis 3). The fourth model examines the negative effect of personal taxes on debt financing (hypothesis 4).

6.2.1.1 The Results for the First Hypothesis Test:

The tax models of capital structure theory claim that due to the tax subsidy, debt should correlate positively with tax rate. However, there has been no means to test whether taxes have a direct role in determining the level of leverage. Givoly, et al. (1992) used the event of the 1986 TRA to test the effect of taxes on leverage and found evidence for the tax model of capital structure theory. Two scenarios can provide a stronger and more direct test of the effect of taxes on leverage. One is to test the change of the level of leverage surrounding the enactment and enforcement of a tax system in a country that did not have a tax system. An example would be the case of the country of Oman, which had

no corporate or personal taxes until 1994. An increase in the general level of firms' leverage would lend support to the theory. Another scenario involves testing the difference in leverage between firms operating in countries that have a tax system in place and those in countries that do not have a tax system. This is, of course, after controlling for all the other foreseeable factors that affect the firm's level of leverage. This dissertation provides the first opportunity, to do a direct test of the tax hypothesis. This test is possible because some of the sample countries have a tax system and others do not.

The first hypothesis test investigates whether the benefits of taxes encourage firms to use more leverage. A dummy variable is included in equation 5.5 that has a value of 1 for tax countries and zero otherwise. The results in Table 6.1 show that, when controlling for the other factors that may affect leverage, the tax dummy variable is positive and significant. This means that tax Arab countries use more debt than non-tax Arab countries. This result conforms to the predictions of the hypothesis and lends solid support to the tax theory, as we know it.

6.2.1.2 The Results for the Second Hypothesis Test:

Due to the tax deductibility of interest, firms with a higher marginal tax rate are expected to use more debt. Therefore, a positive relationship is expected between the firm's effective tax rate and its level of leverage. This relationship is demonstrated in Arab countries that have a tax system and is of no consequence in non-tax Arab countries. However, Arab specificities such as no loss carry forward, firms reporting very low profits, low MTR, and high NDTs, reduce the observable effect of MTR on the level of leverage. As a result, the MTR coefficient is expected to be of low magnitude,

positive, and significant.

Consistent with the hypothesis, MTR is found to be significantly positive in Table 6.1. Table 6.2 shows similar results even when controlling for the country of origin. This means that the lowest MTR does significantly give firms the incentive to use debt.

Titman and Wessels (1988) in the US and Antoniou, et al. (2002) in Europe did not find any significant effect of corporate tax on financial decisions. Givoly, et al. (1992) found the effective tax rate to be positive and significant. Graham (1996) found that firms with higher MTR issue more debt than those with small MTR. Booth, et al. (2001) use the statutory tax rate instead of MTR and found it to have a positive relationship with the firm's level of leverage in developing countries. The conclusion here is that the MTR model is universal; debt has a positive relationship with MTR when MTR is greater than zero, regardless of the country of origin.

6.2.1.3 The Results for the Third Hypothesis Test:

NDTS is positive and significant for the pooled Arab country data. This result is robust because the positive significance is persistent whether the model uses a tax dummy variable or country dummies. The positive relationship between debt and NDTS may be due to the fact that NDTS is a proxy for collateral, as noted in several Western based studies. The substitute relationship between DTS and NDTS is weak in the Arab world. The fact that reported EBIT is low in tax Arab countries and because some Arab countries do not have a tax system, NDTS is not expected to provide a tangible tax break that may substitute for the tax break from paying debt interest. This last argument suggests that there may be a substitute relationship in tax Arab countries if EBIT is high and that NDTS is always a sign of collateral in non-tax Arab countries. Table 6.3 reports

the results for NDTs in tax Arab countries through the interaction between the tax dummy and the NDTs and the results in non-tax Arab countries through the interaction between the non-tax country dummy and NDTs. For tax Arab countries, the relationship is negative and insignificant. This lends weak support to the substitutability effect of NDTs. On the other hand, the results for non-tax Arab countries show a positive and significant relationship, lending support to the collateral aspect of NDTs. In sum, the substitutability relationship is supported if a tax system exists and the MTR is high, and the collateral implication is supported if there are no taxes or the MTR is low.

DeAngelo and Masulis (1980) show that NDTs is a substitute for debt tax shield. Titman & Wessels (1988), Givoly, et al. (1992), Graham (1996), and Hovakimian, et al. (2001) found support for the substitutability argument in the US. Bradley, et al. (1984), and Bathala, et al. (1994) found for the collateral implication of NDTs. The results in the Arab world were consistent with both arguments; therefore, the tax model of capital structure theory is universal and robust regardless of the firm's country of origin.

6.2.1.4 The Results for the Fourth Hypothesis:

Two tests of the effect of personal taxes on the firm's level of leverage were encountered in the literature review of chapter two. The first test in Graham (1996) who proxied for personal taxes by taking the ratio of $(1 - \text{the personal tax rate on interest income})$ to $(1 - \text{the personal tax rate on equity income})$. He found that the relative taxation of debt and equity at the personal level does not seem to affect corporate debt policy. Since debt income is taxed at the investor's tax bracket in the Arab world, it is hard to calculate this ratio here. At this point, we have no means of verifying whether these findings are applicable in the Arab world. The second test in Givoly, et al. (1992) used

the dividend yield as a proxy for this effect. We believe that this variable is troublesome because it proxies for other institutional effects as well as personal taxes. For example, it was argued in chapter four that dividend yield is an indicator of the fact that Arab firms follow a reverse POH. Firms need to raise external capital to finance growth when dividend payout is high. Consequently, due to the reverse POH, Arab firms will most likely raise equity, not debt. The negative relationship between equity and debt financing explains the negative relationship between dividends and debt. Furthermore, La Porta, et al. (2000) argue that dividends are paid to attract future external equity financing, not debt financing, implying a negative relationship between debt and dividends. This negative relationship is further supported because of the negative relationship between debt and external equity financing. Finally, as far as the lending banks are concerned, paying dividends is a sign of commitment to equity holders, not to these lending banks. Hence, banks will try to include more protective covenants in their lending contracts. Such covenants will make debt less appealing to firms, which enforces the negative relationship between debt and dividend payout. On the other hand, debt holders consider paying dividends as an added risk since they mitigate the firm's ability to pay the required timely fixed interest. Debt holders will require a higher return as a compensation for bearing such risk. This in turn makes debt more expensive and less appealing to the firm, thus enhancing the negative relationship between the use of debt and dividend payout.

To avoid these implications of dividend payout, an interaction term is introduced to the regressions to isolate the effect of personal taxes on the use of debt. This interaction term is the product of dividend yield and the marginal tax rate (refer to the previous chapter). Table 6.1 shows the results for personal taxes while controlling for tax

countries and other variables. Tables 6.2 and 6.3 show the results when controlling for country of origin as well as other variables. The results are robust in all of these tables; whether significant or not, personal taxes are always negative, meaning that due to the tax preference of dividend income over interest income in the Arab world, investors prefer equity over debt unless compensated for the higher interest tax burden. This makes debt more expensive to the firm than equity (at the personal tax level). This is also in accordance with Farrar and Selwyn (1967), Brennan (1970), Miller (1977), and DeAngelo and Masulis (1980) in that personal tax consumes at least a portion of the gain from leverage that accrued at the corporate level. This finding also lends further support to the portability of the tax model of capital structure theory across countries.

The dividend yield variable itself gives mixed results. It is negative and significant for the total and long-term debt ratios while positive and significant for the short-term debt ratios. The results for the total and long-term debt ratio provide indirect support for the dividend clientele theory (Givoly, et al. 1992). The results also lend support to the La Porta, et al. (2000) argument that paying dividends in weak law countries is a sign of commitment to the shareholders, not to the debt holders. Moreover, it is consistent with the preference in Arab culture to equity returns. The negative relation can also be explained by the fact that banks (the primary source of debt in the Arab world) prefer firms that pay low dividends. Finally, the weaker protection to debt holders makes them require more stringent debt covenants, one of which is a control over paying dividends. The results, on the other hand, contradict the POH argument that high payout leads to lower retained earnings and higher need for external finance. Since debt is the first choice of external finance (according to POH) then there is a positive relationship between dividends and leverage. This is especially untrue in the Arab world because

firms there follow a reverse POH as will be shown in the results of the eighth hypothesis of this dissertation.

The results for short-term debt ratios are positive and significant. This can be explained by the fact that dividend-paying firms need immediate cash, especially when their profits are limited as is the case in most Arab firms. The best and fastest source for short-term cash is short-term bank loans. This is further supported by the fact that most Arab firms' debt is in the form of short-term bank loans (refer to Table 3.3).

6.2.2 Results for the Agency Conflict Hypotheses Tests:

The discussion in chapters three and four showed that agency costs in the Arab world are minimal. The following two subsections present results for the fifth and the sixth hypotheses. The fifth hypothesis tests the effect of the agency conflict between management and shareholders on the firm's level of leverage. The sixth hypothesis tests the effects of the agency conflict between debt holders and shareholders on capital structure.

6.2.2.1 Results for the Fifth Hypothesis Test:

The fifth hypothesis implies that due to the concentration of ownership in Arab firms, agency conflict is minimal. This is due to the fact that the majority owners in Arab firms are families and/or the government. The fact that the majority of the firm's shares are owned by the family who manages the firm mitigates the shareholder/manager agency conflict. According to Jensen and Meckling (1976), firms with high shareholder/manager agency conflict have the incentive to use debt as an agency-mitigating agent. Consequently, debt is positively correlated with agency conflict. Since agency conflict in

the Arab world is low, we expect firms to use less debt, *ceteris paribus*. In other words, we should expect a negative relationship between family ownership and debt.

Furthermore, since managerial ownership is an agency-mitigating mechanism that can be used to substitute for the use of debt, ownership and debt are expected to be negatively related. Bathala, et al. (1994) found that the use of debt and managerial stock ownership are inversely related to institutional ownership in the firm. This implies that government ownership is negatively related to debt. Because of the greater monitoring on the part of the government, less debt is needed as an agency mitigating mechanism. Finally, Friend and Lang (1988) argue that since higher managerial ownership means less diversification for the manager (human capital and personal wealth are invested in the firm), managers are more risk averse and try to use less debt because it is riskier than equity.

However, due to Arab world specific factors, these models are not expected to fare very well in Arab firms. Since owning and controlling the company is part of the owning family's honor, the family is expected to try to keep that honor. Issuing equity to finance growth means diluting ownership and losing control over the firm. Thus, family owned firms have the incentive not to use equity as a source of finance; such firms are expected to use more debt. On the other hand, as far as debt holders are concerned, government ownership provides assurance that the firm will not fail. This will add to the firm's debt capacity. The results in Table 6.1 show that coefficient of family ownership as a factor explaining leverage is positive and significant while government ownership is positive but not significant. The insignificance of the government ownership coefficient can be explained by the fact that governments are privatizing their companies and the government's assurances either no longer exist or are expected to cease to exist at some point in the future. These facts have more effect in Arab countries because most debt is in

the form of bank loans; banks are more informed than bondholders. Bond markets are a more fertile ground for emotions and emotional reactions than banks because they include smaller and less informed or uninformed investors.

These results lead to the conclusion that the manager/shareholder agency model of capital structure has little explanatory value due to Arab specific factors.

6.2.2.2 The Results for the Sixth Hypothesis Test:

The sixth hypothesis states that there is a positive relationship between debt and growth. As mentioned earlier, this is due to the low debt holder/shareholder agency conflict and to the fact that growth is a proxy for good future prospects of the firm. The results in Table 6.1 show a positive and significant relationship between debt-to-book value of equity ratios and growth and a negative and significant relationship between debt-to-market value of equity ratios and growth. These are the strongest results thus far, because the results are robust. The results exhibit the clearest and most direct effects of country factors on capital structure models. Tables 6.2 and 6.3 show similar results when controlling for country of origin and other factors.

The positive and significant coefficients of the market-to-book ratio in the debt-to-book value of equity equations are due to the fact that most debt in the Arab world is in the form of bank loans. Banks have strong ties with borrowing firms because

- 1- They have long-term relationships
- 2- They are major partners
- 3- They serve as members of the firms' boards
- 4- Bank officials are on their advising committees
- 5- They grant loans to these firms after they have shown the profitability of their

capital budgets through professional feasibility studies, and

6- They are partially owned by these firms.

Therefore, one expects debt agency costs to be negligible. Furthermore, there is no need for the market of corporate control to exist for the purpose of taming such conflict.

Consequently, growth is not expected to cause any agency conflicts. On the contrary, growth may portend promising future for the firm, encouraging banks to provide them with loans. The results show just that. Also, higher market-to-book-ratios arise from higher expected future cash flows, implying higher debt capacity. Finally, firms with high market values relative to their book values have higher borrowing capacities and hence have higher debt levels relative to their book values (Titman and Wessels 1988)

The negative relationship between the debt-to-market value of equity and market-to-book ratio is also robust. This result is due to Arab factors, not the prediction in the theory that market-to-book ratio is a proxy for agency cost-of-debt. First, the increase in stock prices in the late nineties made the market value of equity higher than its book value (stocks are overvalued), which provided firms with the incentive to issue equity rather than debt. Second, the marginal borrowing power on a dollar of market value is less than that on a dollar of book value (Scott 1977). Third, high stock returns are associated with improved growth opportunities and thus, lower optimal leverage ratios (Hovakimian 2001).

Unlike the tax model of capital structure, the results above show that when including institutional factors, the agency model of capital structure fails. Thus, the agency framework is not portable across countries, and a revision of its models is warranted.

6.2.3 Results for the Seventh Hypothesis Test:

Rajan and Zingales (1995), Booth, et al. (2001), and Antoniou, et al. (2002) among a handful of studies that try to tackle some of the institutional factors that create differences in capital structure for similar firms in different countries. Rajan and Zingales (1995) considered factors like taxes, bankruptcy laws, banking systems, capital markets, and ownership and control. They concluded that despite these institutional differences, firm leverage is more similar across G-7 countries than previously thought. Furthermore, they mention that the differences among these countries are not explained by the institutional differences stated earlier. A deeper examination of the data from these countries suggests that the theoretical underpinnings of the observed correlations are still largely unresolved. To do so, deeper understanding of the institutional differences, more data, and more accurate proxies are necessary. Antoniou, et al. (2002) state that their results are generally consistent with the results reported in the literature. The instances of differences in the results can be attributed to differences in corporate governance, tax system, role of capital markets, and investor protection in these countries. Booth, et al. (2001) state that their results generally support conventional capital structure models. However, the regression coefficients differ across countries both in size and sign. There are several possible reasons, some statistical (different number of per-country observations), and some financial (different institutional factors); taxation, legal structures, and bankruptcy laws were among the principal causes.

There are three methods to test the effect of these institutional factors; the first is to test the null hypothesis that everything is institutional and that we can explain capital structure differences by knowing the nationality of a company. The second is to test the null hypothesis that the differences are due to both company-specific factors and country

of origin. In this model the significance of the country of origin should decline. The third method includes country-specific factors and company-specific factors along with the country of origin. In this model, controlling for country and company specific factors should render the country of origin factor insignificant. If the differences between countries persist after controlling for all the company, industry, and country factors, then the Miller (1977) neutral mutations theory applies. The proxies for the country factors are not available for this dissertation because we either do not know the proxy for the factor or the data is not available. For example, the effect of the banking system can be proxied by the number of banks, the number of branches, the bank ownership in the firm or all of them. Since there is no theoretical model to help us determine what proxy to use, it is a mere empirical task to find the appropriate proxies and models to test these effects. This topic will be left for future research.

This seventh hypothesis is tested by using an all-country dummy model and then a model that includes both country dummies and the other factors considered in this dissertation. Table 6.4 gives the results of the regression model using country dummies as the sole independent variables. Tunisia is excluded to avoid the perfect multicollinearity trap and because Tunisia has the highest debt level of all Arab countries. The rationale behind this choice is to compare the debt levels of Arab countries with those in Western economies that have an even higher debt level than that of Tunisia. For example, if a certain Arab country has a significantly lower debt level than that of Tunisia, then that country, necessarily, has a lower debt level than those in Western economies. The coefficients should be interpreted as the significance of debt ratio differences relative to Tunisia, or Western countries for that matter. Significant or not, the Arab countries' debt ratios are lower than that of Tunisia. Saudi Arabia is the only country that has a positive

coefficient in three of the six debt ratios. This is perhaps due to the advanced interest banking system and the relative weakness of the taboo against interest in Saudi Arabia. These coefficients are, however, not significant and very small, meaning that they are still lower than those in Western countries. A formal debt comparison with Western countries is left for further research.

The Table 6.4 coefficient estimates (TOBIT) agree with those of table 6.4a (OLS) in sign and level of significance. Both the total debt ratio and the short-term debt ratios' (book and market value of equity) models are significant at the 1% level, and the long-term debt ratio models are significant at the 5 and 10% levels (book and market value of equity, respectively). For the total debt ratios, 4% of the variability in debt ratios is explained by the nationality of the company. For the debt ratios, the explanatory power is 2%. For the short-term debt ratios, it is 6 and 7% for the book and market values of equity respectively. According to Booth, et al. (2001), there are three explanations for these results:

- 1- The different debt ratios reflect differences in industrial structure and other company-specific factors, such as business risk. This explanation is not valid. Once these factors are included in the models, the significance of the country dummies (separately or collectively) does not decline; rather, it increases in some cases. See Tables 6.2 and 6.3.
- 2- There are systematic differences in the effect of factors such as those discussed in chapter three. The coefficients on the independent variables are different because of the country effects attributable to missing variables. These differences are not profound because of the similarities between the Arab countries' factors. Such differences will be more profound once these countries are compared with a

Western country. Empirical evidence supports this claim; a regression was run to compare US companies with the Arab companies in the sample, and the results (not presented here) showed larger magnitudes and higher levels of significance than those reported in Tables 6.4 and 6.4a.

- 3- The results could be spurious either because of inadequate data (this reasoning is not applicable here due to the reliability of the data set) or because of Miller's (1977) neutral mutation theory. The purpose of this dissertation is to prove that country factors are at work and they are as shown in the arguments and results of this research.

The results for the second approach in testing the effects of the country of origin on capital structure are reported in Tables 6.2 and 6.3. Testing country dummies while controlling for the other determinants shows that the significance of the country dummies increased. An F test on the country dummies in these models shows that they are significant at the 1% level for all debt ratios. The R^2 increases from 17-27% (for all debt ratios, see Table 6.1a) without the country dummies to 20-40% (for all debt ratios, see Tables 6.2a and 6.3a) with the country dummies. The regression coefficients are comparable in all regressions. This is true for both the country dummies and for the firm specific factors.

In sum, there are country specific factors that affect the firm's level of leverage. These factors are not known to us and are significant. The F values, t values, and the R squares lend support to this hypothesis. The country dummies that were used to proxy for these factors should come out insignificant if we include exact proxies for these factors. The general conclusion here is that capital structure theory that was developed in Western economies is only partially effective in other environments such as the Arab world. The

theory needs to be revised to include such factors.

6.2.4 Results for the Eighth Hypothesis Test:

The eighth hypothesis states that due to regional and country-specific factors, Arab country firms follow a reverse POH. The intention of this hypothesis is to test the informational asymmetry model of capital structure theory.

Summary statistics are used to test this hypothesis due to the short time series, as discussed earlier. The POH suggests that firms' financing behavior depends on the asymmetry of information between the firm's insiders and the market. The choice of financing source is determined according to this informational asymmetry. To avoid any decline in the stock price, management refuses to issue new shares unless the marginal benefits from the use of the funds is at least equal to the marginal costs (decline in stock price) due to the issuance of the new shares. To avoid the decline in stock prices altogether, issuing debt is in order if internal resources are not sufficient. This conclusion is the Pecking Order Hypothesis.

The results in Table 6.5 show that Arab firms follow a reverse POH. Of the firm's funds, 15% come from retained earnings, 16% from debt and 70% from the issuance of new equity. This is the opposite of the POH, which is followed closely by Western countries. For example, 86% of the US firms' funds come from retained earnings while only 1% comes from new equity and the remaining 13% from debt. The results show that Arab firms behave exactly in an opposite manner to the one implied by the POH. As discussed earlier, the reasons for such behavior stem from factors specific to the Arab world. Examples are the continuous increase of stock prices in Arab stock markets throughout the nineties, the sponsorship of Arab governments for their respective

markets, the preferred tax treatment of equity income over interest income, the prohibition of interest, the weakness or absence of a bond market, and the fact that Arab firms generate low profits that may not be enough to meet the timely obligations of debt.

These reasons make equity financing more attractive than debt financing. Finally the fact that Arab firms do not generate enough profits to retain and use to finance growth, combined with the fact that they need funds to pay dividends to build the reputation to be able to market future equity issues (the La Porta, et al. 2000 argument) makes it Difficult for these firms to use retained earnings to finance growth. As a result, the optimal financing order for these firms is the exact reverse of the POH.

6.3 Control Variables Results

In this section, the results for the control variables are presented. No formal hypotheses are made in regards to these variables. However, expectations of the effects of the Arab factors on their magnitudes, directions, and levels of significance were developed in chapter four. The following subsections document the results for each of these variables. Their magnitudes, signs, and levels of significance are discussed in light of the Arab factors. Moreover, in an attempt to investigate the role of these factors in testing capital structure theory, a comparison of the results with both prior expectations and the results of similar tests in developed and developing countries is presented.

As pointed out earlier, some Arab countries' institutional factors are similar to those in Western economies. These similarities are due to many factors, some of which are:

- 1- In their efforts to build their economies, Arab governments, companies, and academicians all try to follow the footsteps of the West.

- 2- Many Arab countries were colonized by the West and have legal and economic systems that have carried over from their colonial past.
- 3- The terms of membership in both the World Bank and the International Monetary Fund mandate homogeneity with Western economies. Moreover these two international institutions required economic restructuring (becoming Western-like) when Arab countries needed their help.
- 4- Homogeneity is spontaneously created when countries want to join the GATT and WTO. Arab countries have been most active in these efforts since the late 1980's.
- 5- Arab countries have been amending their laws and economic systems to meet the requirements of international investors who are usually from Western economies.

However, there still exist some country traditions and institutional factors that are different from those in Western economies. The presentation in chapter three included Arab culture, absence of bond markets, different tax treatment of various types of income, lower efficiency of capital markets, and ownership structure. These differences are expected to have minor effects on the control variables and should not impinge on the robustness of capital structure theory in this capacity.

The control variables are used in the tests of all the hypotheses other than the eighth one (due to the different methodology employed there). Tables 6.1, 6.2, 6.3, and 6.4 present the estimates for these variables. The results for all four control variables are robust regardless of the other variables in the models. For instance, collateral is positive and significant in all estimations; the only change is a slightly smaller or larger magnitude or slightly higher or lower level of significance. These minor variations should not harm the main finding. These variables are summarized and isolated here to abridge the presentation. The tests are two tailed unless otherwise stated. One-tailed tests are used

when both the level of significance and the direction of the estimated value are being tested. Following are the results for each of the control variables.

6.3.1 Collateral

The ratio of tangible assets to total assets is positive and significant at the 1% level for both long term and total debt ratios. This is consistent with the theory in that the availability of collateral increases the debt capacity of the firm. This is especially true in Arab economies since they are considered bank based. In these economies, collateral is more significant since it is a requirement when acquiring bank loans. Harris and Raviv (1990a) and Stulz (1990) demonstrate that leverage is positively correlated with liquidation and aggregate value of the firm. This finding is supported by empirical evidence in the studies shown in Table 2.4. Rajan and Zingales (1995) argue that tangible assets are easy to collateralize, and thus they reduce the agency cost of debt. They also state that firms with a close relationship to creditors (i.e. banks) need to provide less collateral because relationship substitutes for the need for collateral. This may only be true for short-term small-sized loans, and may be the reason collateral is not significant in the short-term debt equations. Antoniou, et al. (2002) argue that firms with high tangible assets face difficulties in shifting their investments to riskier projects as their debt is secured against these assets. Therefore, tangible assets mitigate the agency cost of debt financing, thereby raising the optimal level of debt. In that respect, tangible assets can be considered as insurance to the creditors because in case of bankruptcy and liquidation some value exists to be awarded to these creditors in the form of compensation. This is especially true in the Arab world where liquidation is one of the immediate results of bankruptcy. Furthermore, banking laws in the Arab world limit the amount of

uncollateralized loans made by banks. Similarly, banks traditionally require sufficient collateral, causing a positive relationship between the fixed assets and leverage. Tangible assets are both negative and insignificant in short-term debt-ratio equations because larger firms are more likely to possess an abundance of tangible assets. These firms either do not need short-term funds or can acquire them from the banks with which they have a long relationship without the need for collateral. Also, short-term funds are usually smaller in amount than long term funds and are trivial compared to the size of the firm's tangible assets.

Intangible assets are positive and significant. Though this contradicts the conventional wisdom, it conforms to the traditions in the Arab world. The reason is that intangible assets (as shown in Arab company balance sheets and explained in their footnotes) usually represent reputation, copyrights, patents or some form of goodwill. These are signs of monopolistic features that indicate the higher future earnings that are desired by banks. Additionally, the same finding for short-term debt relationship with intangible assets applies to tangible assets.

The general finding here is that collateral is positive and of high significance; this is explained by the bank-based borrowing that is common in the Arab world. Additionally, short-term debt is more common in smaller firms, which is consistent with the finding of Titman and Wessels (1988).

6.3.2 Size:

The proxy for the size variable is the natural log of sales. Its coefficient is positive and significant at the 1% level for all debt ratios, with higher magnitude for long-term debt and total debt than for short-term debt ratios. This implies that firms use less short-

term debt than long-term debt. Ragan and Zingales (1995) state that size can be considered a proxy for the inverse probability of default and should not be significant in countries where the costs of financial distress are low. Knowing that in Arab countries it is easy to liquidate a distressed company and that the possibility of a stay on liquidation is very low, it is expected that size will show a high significance. This is exactly the case in the results, where size shows the highest level of significance of all the variables estimates and for all the debt ratios. In a similar argument, Antoniou, et al. (2002) state that larger firms are less exposed to bankruptcy risk. Hence, the positive relationship between debt and size implies that the cost of financial distress is one of the main determinants of the use of leverage. This is true in the Arab world since banks compete in both owning and lending to large firms. One can deduce here that short-term debt is more common among smaller firms. This is further confirmed in the short-term debt equation, which shows a smaller coefficient. Moreover, as argued by Warner (1977), market value of a firm is inversely related to the ratio of direct cost of bankruptcy to firm value. This implies that large firms might not envisage considerable difficulties in raising external loans. Assuming that size is an inverse proxy for bankruptcy probability, these arguments may help explain the positive association between firm size and leverage. This argument is more relevant in the Arab world since the bankruptcy code is not conducive to reorganizing firms, and firms entering bankruptcy are usually liquidated in a costly and lengthy liquidation procedure.

In the Arab world, as in other places of the world, sales are a transparent sign of reputation and capacity. This makes firms with higher sales a preferred target for banks that are looking for capacity to repay loans.

Finally, the positive relationship between debt and size implies that the

borrowing capacity of the firm is significantly limited by its bankruptcy risk and that the optimal leverage ratio of the firms with lower bankruptcy risk is high.

6.3.3 Volatility

The proxy for volatility is the standard deviation of earnings. The coefficient is negative and significant. The level of significance is low due to fact that 70% of the per-firm data was available for three years only. Also, Titman and Wessels (1988) argue that the standard deviation of the change in operating income cannot be directly affected by the firm's debt level. Moreover, they argue that the potential for spurious correlation arises if the impact of leverage and taxes is not completely purged from the volatility estimates. They found the relationship to be negative but never significant. For similar reasons, Antoniou, et al. (2002) found volatility to exhibit mixed, but always insignificant, signs. They suggest that the relation is spurious. However, since advanced and risk-calculating banks are the source of debt in Arab countries, it is logical to reach the same conclusion here.

Bradley, et al. (1984) found volatility to be significant and negatively related to firm leverage ratios. The explanation is that volatility is a proxy for the cost of financial distress. Hence, higher costs of financial distress lead to lower borrowing capacity. Along these lines, the expectations were that volatility would exhibit a negative association with debt in the Arab world. This is especially true in the Arab world because Arab banks, the major source of debt for Arab firms, are advanced and take volatility into account when they study the credit-worthiness of the borrowing firm. Another line of reasoning suggests that volatility may exhibit low significance because banks have close relations with their customers, i.e. the borrowing firms. Bathala, et al. (1994) found an inverse

relationship between debt and earnings volatility. These results are consistent with the findings of Bradley, et al. (1984) among others.

Firms with high earnings volatility are more likely to miss debt service payments over time; this increases the probability of bankruptcy. Higher costs of debt compared to its benefits decrease the optimal amount of debt used by the firm. The main restriction on debt financing is the availability of cash to service it in a timely manner. Any fluctuation in the availability of cash simply means that creditors will drive the firm into bankruptcy (unless of course the indenture specifies otherwise, or there is a close long-term relationship between the firm and its creditors as in most bank-based economies). Business risk usually causes unwanted fluctuations in the level of cash the firm needs to hold. Volatility of earnings is a measure of such risk; since debt requires a steady level of cash flows, it only makes sense that firms with volatile earnings (i.e. high business risk) should use less debt. However, the above results and the results of some studies found a weak relationship between debt and earnings volatility. The above discussion suggests earnings volatility is not a sufficient measure of business risk and other variables need to be included. Further investigation of this topic is warranted.

6.3.4 Profitability

Earnings before interest and taxes normalized by total assets is the proxy for profitability. The results show that the relationship between the level of debt and profitability is significantly negative for all debt ratios. Other studies found similar results and blamed them on consistency with the POH. Further investigation of this issue is needed. It is expected that a regression of equity on profitability would produce stronger results than that for debt on profitability in the Arab world. This stronger relationship is

due to the fact that Arab firms follow a reverse POH. The conclusion here is that profitability means less reliance on external financing in general. This is based on the view that higher profitability increases internal resources and hence reduces the need for external financing. The results also imply a rejection of the free cash flow theory of Jensen (1986) that implies a positive relation. This in turn implies that the free cash flow agency conflict predictions cannot outweigh the predictions of POH based on the implications of information asymmetry. It also contradicts the finding of Hovakimian, et al. (2001) in which they suggest that debt is positively related to profits since the latter is positively related to higher assets that imply a higher capacity for debt.

Titman and Wessels (1988) found debt to have a negative and significant relationship with profitability. They explain this relationship to be partially due to the transaction costs that accompany the issuance of debt. This explanation does not apply in the Arab world since most of the debt is in the form of bank loans. Rajan and Zingales (1995) explain this inverse relationship by the fact that profitability may proxy for the quality of investment opportunities. This fact was used to explain the different levels of significance in their sample countries. Assuming that their argument is valid, one would expect a positive relationship between debt and profitability, especially in bank-based economies. This argument will be adopted here to explain the low level of significance. Antoniou, et al. (2002) explain the negative relationship in weak law countries to be due to the relatively weaker protection of investors and creditors, implying difficulty in raising external capital and forcing firms to rely on internal equity. This is also true in Arab countries. However, the fact that firms in weak law countries revert to other tactics to overcome the difficulty of raising external funds contradicts this argument. One of these tactics, introduced by La Porta, et al. (2000), is the increased payment of

Dividends. Antoniuo, et al. (2002) explain the low level of significance by the fact that firms' close relation with banks and concentrated ownership mitigate asymmetric information problems. This reduces their dependence on internal financing. The fact that Arab firms are closely held and the fact that most debt is in the form of bank loans gives more credibility to this explanation.

In summary, the results fare very well in the Arab world where financial markets are less than perfect and informational asymmetry is high. Higher profits cause firms to pay higher dividends and build the reputation of being fair to the shareholders, which helps in marketing future stock issues. Additionally, as argued earlier and as was seen in the results of hypothesis eight, these results help explain the fact that Arab firms follow a reverse pecking order. Thus, higher profits mean higher ability to pay dividends and higher ability to raise more equity and a lower need for debt financing. Ultimately, higher profitability relieves the firm from raising external funds altogether.

6.3.5 Concluding Remarks on the Control Variables:

The results above show that Arab firms' reaction to the control variables is similar to that in Western economies. This may be due to reasons specific to the Arab world. There are also minor differences between the results in the Arab world and those in Western economies. For example, intangible assets in the Arab world are significant and positive because they are a sign of reputation. On the other hand, intangible assets are negative in Western economies because they are a sign of lack of collateral. These findings show that the robustness of the theory is limited. This limitation is due to problems in the choice of proxy, as is the case in volatility, or due to the fact that the sign and significance are due to reasons other than the ones asserted by theory. For example,

the negative relationship between debt and profitability is weaker than originally thought because in the Arab world, firms tend to use more equity than debt when profits are low.

Table 6.1

Estimated Coefficients for the First Hypothesis

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using maximum likelihood and a censored Tobit model. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 DTAX + \beta_2 MTR + \beta_3 NDTs + \beta_4 MB + \beta_5 DIVNI + \beta_6 MTRDIV + \beta_7 FAM + \beta_8 GOV +$$

$$\beta_9 TANTA + \beta_{10} INTANTA + \beta_{11} LNS + \beta_{12} SDOE + \beta_{13} EBITTA + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTDMV	STDMV
Intercept	-2.234*** (-6.16)	-2.435*** (-5.45)	-1.055*** (-2.78)	-1.461*** (-2.55)	-1.624*** (-2.02)	-1.830*** (-2.81)
Dtax	0.035 (0.18)	0.142* (1.60)	-0.003 (-0.04)	0.277*** (2.92)	0.335*** (3.01)	0.061 (0.45)
MTR	0.818*** (3.86)	0.407** (1.70)	0.823*** (7.61)	1.318*** (4.41)	0.728*** (1.97)	1.054*** (3.27)
NDTS	1.782*** (3.99)	1.281*** (2.29)	0.541** (1.67)	0.251 (0.39)	0.314 (0.38)	1.372*** (2.99)
MB	0.038** (1.96)	0.040** (1.96)	-0.012 (-0.56)	-0.062*** (-1.99)	-0.046** (-1.80)	-0.068*** (-2.01)
DIVNI	-0.160** (-1.69)	-0.276*** (-2.73)	0.107* (1.58)	-0.184* (-1.64)	-0.403*** (-2.96)	0.272*** (2.00)
MTRDIV	-0.450 (-0.99)	-0.092 (-0.12)	-0.663 (-1.32)	-0.623 (-1.03)	0.250 (0.28)	-1.695*** (-1.99)
FAM	0.363** (1.88)	0.411** (1.86)	0.232* (1.65)	0.233 (1.12)	0.248 (1.15)	0.337 (1.36)
GOV	0.013 (0.05)	0.195 (0.99)	-0.017 (-0.02)	0.028 (0.06)	0.032 (0.08)	0.137 (0.40)
TANTA	0.353*** (2.09)	0.451*** (2.11)	0.007 (0.05)	0.503*** (2.65)	0.601*** (3.01)	0.035 (0.19)
INTANTA	1.852*** (3.44)	1.294*** (2.97)	0.763*** (2.27)	2.196*** (4.52)	2.311*** (5.15)	0.177*** (2.26)
LNS	0.129*** (6.72)	0.131*** (6.12)	0.048*** (1.98)	0.092*** (3.43)	0.094*** (3.22)	0.087*** (2.08)
SDOE	-0.102 (-1.29)	-0.132* (-1.49)	-0.112** (-1.78)	-0.231*** (-1.97)	-0.268*** (-2.13)	-0.159** (-1.83)
EBITTA	-1.911*** (-4.14)	-1.986*** (-2.99)	-0.231 (-0.68)	-1.529*** (-2.38)	-1.786*** (-2.11)	-0.765* (-1.59)

The sample size is from 624-1108. The significance levels of the TOBIT model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.1a

Estimated Coefficients for the First Hypothesis

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using OLS. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 DTAX + \beta_2 MTR + \beta_3 NDTs + \beta_4 MB + \beta_5 DIVNI + \beta_6 MTRDIV + \beta_7 FAM + \beta_8 GOV + \beta_9 TANTA + \beta_{10} INTANTA + \beta_{11} LNS + \beta_{12} SDOE + \beta_{13} EBITTA + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTMV	STDMV	VIF
Intercept	-1.439*** (-5.94)	-1.123*** (-5.06)	-0.228*** (-2.42)	-0.732*** (-2.30)	-0.348 (-1.28)	-0.522*** (-2.8)	0
Dtax	0.018 (0.28)	0.060 (1.00)	-0.030 (-1.18)	0.234*** (2.72)	0.214*** (2.91)	-0.001 (-0.02)	1.113
MTR	0.710*** (3.72)	0.284* (1.62)	0.488*** (6.58)	1.049*** (4.19)	0.510*** (2.38)	0.437*** (2.98)	1.243
NDTS	1.311*** (3.69)	0.566** (1.74)	0.202* (1.47)	0.052 (0.11)	-0.168 (-0.42)	0.759*** (2.78)	1.338
MB	0.044*** (2.78)	0.043*** (2.93)	0.006 (1.02)	-0.061*** (-2.9)	-0.039*** (-2.17)	-0.031*** (-2.56)	1.105
DIVNI	-0.121* (-1.60)	-0.175*** (-2.54)	0.034 (1.15)	-0.161** (-1.64)	-0.265*** (-3.14)	0.096** (1.67)	1.666
MTRDIV	-0.731 (-1.39)	-0.444 (-0.92)	-0.203 (-0.99)	-0.998* (-1.45)	-0.229 (-0.39)	-0.807*** (-1.99)	1.617
FAM	0.588*** (3.65)	0.411*** (2.78)	0.179*** (2.86)	0.558*** (2.64)	0.266* (1.47)	0.324*** (2.62)	2.343
GOV	0.318*** (1.99)	0.209 (1.43)	0.107** (1.73)	0.331* (1.58)	0.079 (0.44)	0.237** (1.93)	2.363
TANTA	0.149** (1.58)	0.153** (1.77)	0.003 (0.07)	0.279*** (2.26)	0.304*** (2.87)	-0.008 (-0.12)	1.113
INTANTA	1.159*** (3.14)	0.977*** (2.88)	0.193 (1.35)	2.011*** (4.14)	2.018*** (4.87)	-0.008 (-0.03)	1.147
LNS	0.080*** (5.96)	0.064*** (5.21)	0.010** (1.91)	0.047*** (2.7)	0.028** (1.89)	0.029*** (2.85)	1.445
SDOE	-0.020 (-0.34)	-0.023 (-0.42)	-0.008 (-0.33)	-0.126* (-1.63)	-0.102* (-1.53)	-0.026 (-0.58)	1.179
EBITTA	-1.280*** (-3.81)	-0.878*** (-2.85)	-0.125 (-0.96)	-0.959*** (-2.17)	-0.695** (-1.85)	-0.657* (-2.62)	1.494
F	12.23***	7.53***	7.81***	7.3***	6.46***	4.13	
QSQUARE	0.37	0.27	0.27	0.26	0.24	0.17	

The sample size is from 624-1108. The significance levels of the OLS model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.2

Estimated Coefficients for the Second, Fourth, Fifth, Sixth and Seventh Hypotheses

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using maximum likelihood and a censored Tobit model. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 MTR + \beta_2 NDTs + \beta_3 MTRDIV + \beta_4 DIVNI + \beta_5 MB + \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \beta_{10} EGYPT + \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \beta_{14} DOMAN + \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \beta_{18} DUAE + \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \beta_{23} EBITTA + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTDMV	STDMV
Intercept	-1.735*** (-3.02)	-1.914*** (-2.66)	-0.858*** (-1.96)	-0.388 (-0.66)	-0.871* (-1.62)	-1.171*** (-1.96)
MTR	0.637*** (3.46)	0.325 (1.22)	0.530*** (5.98)	1.061*** (4.12)	0.548** (1.88)	0.779*** (2.73)
NDTS	1.070*** (1.99)	0.883** (1.68)	-0.520 (-1.12)	-0.845 (-1.02)	-0.428 (-0.46)	0.422 (0.48)
MTRDIV	-1.486*** (-2.04)	-0.695 (-1.07)	-1.875*** (-2.88)	-2.243*** (-3.15)	-0.563 (-0.45)	-3.312*** (-3.33)
DIVNI	-0.141* (-1.47)	-0.252*** (-2.98)	0.104* (1.52)	-0.123 (-1.13)	-0.366*** (-3.00)	0.302*** (1.99)
MB	0.050*** (3.46)	0.047*** (2.02)	0.0111 (0.97)	-0.049** (-1.92)	-0.039* (-1.47)	-0.05*** (-1.97)
GOV	-0.007 (-0.07)	0.163 (0.56)	-0.035 (-0.18)	0.023 (0.09)	0.026 (0.09)	0.086 (0.27)
FAM	0.249 (1.35)	0.331* (1.48)	0.073 (0.35)	0.119 (0.34)	0.210 (0.75)	0.103 (0.38)
Dbahrain	-0.595*** (-2.85)	-0.572*** (-2.05)	-0.268* (-1.46)	-1.108*** (-4.12)	-0.780*** (-3.46)	-0.735*** (-2.96)
Degypt	-0.592*** (-2.93)	-0.633*** (-3.41)	-0.210 (-1.28)	-0.798*** (-3.36)	-0.585** (-1.85)	-0.468** (-1.79)
Djordan	-0.426** (-1.80)	-0.363 (-1.42)	0.057 (0.37)	-0.488* (-1.57)	-0.178 (-0.48)	-0.279 (-0.98)
Dkuwait	-0.393** (-1.74)	-0.414** (-1.79)	-0.005 (-0.08)	-0.827*** (-3.91)	-0.559** (-1.88)	-0.492** (-1.82)
Dlebanon	-0.251 (-0.58)	-0.360 (-0.88)	0.111 (0.39)	-0.424 (-1.02)	-0.409 (-1.03)	-0.156 (-0.22)
Dmorocco	-0.310 (-0.85)	-0.504 (-1.02)	0.202 (0.59)	-0.648 (-1.32)	-0.663 (-1.35)	-0.097 (-0.05)
Doman	-0.389* (-1.64)	-0.349 (-1.28)	-0.087 (-0.33)	-0.558** (-1.74)	-0.186 (-0.44)	-0.561** (-1.85)

Table 6.2 (Continued)

Dpalestine	-3.170 (-0.01)	-3.260 (-0.01)	-1.634 (-0.01)	-4.543 (-0.01)	-4.318 (-0.01)	-2.947 (-0.01)
Dqatar	-0.574** (-1.66)	-0.538* (-1.68)	0.083 (0.34)	-1.063*** (-1.97)	-0.700* (-1.63)	-0.267 (-0.51)
Dsaudi	-0.265 (-1.28)	-0.451*** (-1.98)	0.213 (1.27)	-0.626*** (-1.98)	-0.534*** (-1.96)	-0.134 (-0.41)
DUAЕ	-0.579*** (-2.82)	-0.649*** (-2.76)	-0.190 (-1.21)	-1.185*** (-4.61)	-0.941*** (-3.01)	-0.572*** (-2.05)
TANTA	0.362*** (3.03)	0.479*** (2.84)	-0.022 (-0.08)	0.451*** (2.05)	0.569*** (2.01)	0.003 (0.02)
INTANTA	1.727*** (2.91)	1.295*** (3.17)	0.427* (1.56)	1.790*** (3.77)	2.087*** (4.51)	-0.349 (-0.52)
LNS	0.128*** (5.74)	0.132*** (4.88)	0.044*** (2.06)	0.084*** (2.23)	0.088*** (2.20)	0.081*** (2.18)
SDOE	-0.061 (-0.55)	-0.128* (-1.45)	-0.050 (-0.76)	-0.181** (-1.78)	-0.260*** (-1.99)	-0.059 (-0.44)
EBITTA	-1.639*** (-3.60)	-1.735*** (-2.77)	0.129 (0.22)	-0.893* (-1.45)	-1.208** (-1.75)	-0.503 (-1.05)

The sample size is from 624-1108. The significance levels of the TOBIT model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.2a

Estimated Coefficients for the Second, Fourth, Fifth, Sixth and Seventh Hypotheses

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using OLS. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 MTR + \beta_2 NDTs + \beta_3 MTRDIV + \beta_4 DIVNI + \beta_5 MB + \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \beta_{10} EGYPT + \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \beta_{14} DOMAN + \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \beta_{18} DUAE + \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \beta_{23} EBITTA + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTDMMV	STDMV	VIF
Intercept	-0.935*** (-2.92)	-0.710*** (-2.40)	-0.133 (-1.12)	0.280 (0.68)	0.262 (0.73)	-0.081 (-0.33)	0
MTR	0.647*** (3.22)	0.267* (1.44)	0.397*** (5.29)	0.924*** (3.56)	0.434*** (1.92)	0.384*** (2.52)	1.399
NDTS	0.948*** (2.38)	0.377 (1.03)	-0.111 (-0.75)	-0.545 (-1.06)	-0.457 (-1.02)	0.476* (1.58)	1.704
MTRDIV	-1.498*** (-2.55)	-0.931** (-1.72)	-0.615*** (-2.81)	-2.277*** (-3.01)	-0.859 (-1.30)	-1.475*** (-3.31)	2.041
DIVNI	-0.107 (-1.36)	-0.175*** (-2.41)	0.044* (1.51)	-0.107 (-1.05)	-0.247*** (-2.79)	0.130*** (2.18)	1.853
MB	0.050*** (3.07)	0.047*** (3.11)	0.010** (1.67)	-0.054*** (-2.59)	-0.036** (-1.95)	-0.029*** (-2.31)	1.168
GOV	0.280** (1.76)	0.174 (1.18)	0.104** (1.75)	0.301* (1.46)	0.066 (0.37)	0.222** (1.83)	2.394
FAM	0.491*** (3.00)	0.342*** (2.26)	0.136*** (2.22)	0.463*** (2.19)	0.237 (1.29)	0.253*** (2.03)	2.463
Dbahrain	-0.517*** (-2.77)	-0.447*** (-2.59)	-0.104* (-1.50)	-0.975*** (-4.04)	-0.613*** (-2.91)	-0.369*** (-2.60)	8.991
Degypt	-0.526*** (-2.79)	-0.537*** (-3.08)	-0.048 (-0.69)	-0.735*** (-3.02)	-0.503*** (-2.37)	-0.217* (-1.51)	6.807
Djordan	-0.489*** (-2.48)	-0.419*** (-2.30)	-0.060 (-0.83)	-0.550*** (-2.16)	-0.274 (-1.24)	-0.293*** (-1.96)	3.582
Dkuwait	-0.456*** (-2.54)	-0.391*** (-2.36)	-0.066 (-0.99)	-0.85878 (-3.70)	-0.529*** (-2.62)	-0.363*** (-2.66)	10.025
Dlebanon	-0.375 (-1.31)	-0.369 (-1.40)	0.003 (0.03)	-0.590* (-1.60)	-0.453 (-1.41)	-0.204 (-0.94)	1.676
Dmorocco	-0.423 (-1.33)	-0.362 (-1.23)	-0.043 (-0.37)	-0.771** (-1.88)	-0.509 (-1.42)	-0.294 (-1.22)	1.386
Doman	-0.432*** (-2.11)	-0.349** (-1.84)	-0.082 (-1.08)	-0.576*** (-2.17)	-0.234 (-1.02)	-0.373*** (-2.39)	3.619
Dpalestine	-0.419* (-1.33)	-0.374 (-1.23)	-0.041 (-0.37)	-0.943*** (-3.70)	-0.652*** (-2.62)	-0.309 (-1.22)	1.682

Table 6.2a (Continued)

	(-1.47)	(-1.42)	(-0.39)	(-2.55)	(-2.02)	(-1.42)	
Dqatar	-0.551***	-0.484***	-0.083	-0.968***	-0.647***	-0.344**	1.868
	(-2.11)	(-2.00)	(-0.86)	(-2.86)	(-2.20)	(-1.73)	
Dsaudi	-0.306**	-0.358***	0.067	-0.643***	-0.462***	-0.161	11.108
	(-1.78)	(-2.26)	(1.05)	(-2.90)	(-2.39)	(-1.24)	
DUAE	-0.460***	-0.416***	-0.089	-0.975***	-0.621***	-0.330***	7.231
	(-2.49)	(-2.44)	(-1.29)	(-4.09)	(-2.99)	(-2.36)	
TANTA	0.190**	0.204***	-0.006	0.289***	0.322***	-0.010	1.233
	(1.93)	(2.23)	(-0.17)	(2.26)	(2.90)	(-0.13)	
INTANTA	1.087***	1.039***	0.054	1.698***	1.904***	-0.253	1.206
	(2.88)	(2.98)	(0.39)	(3.48)	(4.48)	(-0.88)	
LNS	0.077***	0.065***	0.008*	0.038***	0.023	0.022**	1.839
	(5.18)	(4.69)	(1.44)	(1.96)	(1.42)	(1.94)	
SDOE	0.014	-0.009	0.016	-0.086	-0.090	0.011	1.274
	(0.24)	(-0.16)	(0.72)	(-1.09)	(-1.32)	(0.24)	
EBITTA	-1.215***	-0.823***	-0.062	-0.617	-0.438	-0.622***	1.712
	(-3.40)	(-2.50)	(-0.47)	(-1.34)	(-1.09)	(-2.29)	
F	7.6***	4.7***	6.3***	5.3***	4.16***	3.37***	
RSQUARE	0.4	0.29	0.36	0.26	0.2	0.23	

The sample size is from 624-1108. The significance levels of the OLS model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.3

Estimated Coefficients for the Third Hypothesis in Both Tax Arab Countries and Non-Tax Arab Countries

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using maximum likelihood and a censored Tobit model. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 NDTS * DTAX + \beta_2 NDTS * NDTAX + \beta_3 MTR + \beta_4 DIVNI + \beta_5 MB + \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \beta_{10} EGYPT + \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \beta_{14} DOMAN + \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \beta_{18} DUAE + \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \beta_{23} EBITTA + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTDMMV	STDMV
Intercept	-1.639*** (-2.99)	-1.809*** (-2.36)	-0.843*** (-1.99)	-0.339 (-0.93)	-0.739 (-1.29)	-1.165*** (-1.96)
NDTSTAX	-0.824 (-0.78)	-1.058 (-0.72)	-0.903 (-0.84)	-1.857 (-1.03)	-2.873 (-1.41)	0.287 (0.13)
NDTSNONTAX	1.224*** (2.69)	1.027*** (1.97)	-0.485 (-1.25)	-0.744 (-1.28)	-0.192 (-0.29)	0.429 (1.20)
MTR	0.594*** (3.67)	0.283 (1.27)	0.522*** (6.01)	1.035*** (3.68)	0.496* (1.62)	0.776*** (2.96)
MTRDIV	-1.577*** (-2.01)	-0.801 (-1.08)	-1.888*** (-3.01)	-2.291*** (-3.11)	-0.687 (-0.77)	-3.318*** (-3.67)
DIVNI	-0.143* (-1.58)	-0.254*** (-2.02)	0.105* (1.58)	-0.124 (-1.17)	-0.368*** (-2.96)	0.301*** (2.01)
MB	0.051*** (3.17)	0.047*** (2.05)	0.011 (1.16)	-0.048*** (-1.97)	-0.038* (-1.50)	-0.051*** (-1.99)
GOV	-0.006 (-0.07)	0.164 (1.14)	-0.036 (-0.31)	0.022 (0.05)	0.026 (0.06)	0.085 (0.22)
FAM	0.252 (1.31)	0.333* (1.52)	0.071 (0.45)	0.121 (0.43)	0.213 (0.38)	0.102 (0.48)
Dbahrain	-0.681*** (-2.21)	-0.661*** (-2.37)	-0.285* (-1.49)	-1.156*** (-3.06)	-0.893*** (-3.24)	-0.741*** (-2.02)
Degypt	-0.678*** (-3.03)	-0.722*** (-3.36)	-0.226 (-1.26)	-0.845*** (-2.96)	-0.698*** (-1.98)	-0.474** (-1.66)
Djordan	-0.383* (-1.61)	-0.326 (-1.32)	0.066 (0.33)	-0.465* (-1.53)	-0.134 (-0.33)	-0.275 (-1.29)
Dkuwait	-0.482*** (-1.99)	-0.506*** (-1.98)	-0.021 (-0.10)	-0.876*** (-4.19)	-0.679*** (-2.02)	-0.455** (-1.77)
Dlebanon	-0.182 (-0.66)	-0.287 (-0.94)	0.122 (0.56)	-0.388 (-1.01)	-0.318 (-0.99)	-0.152 (-0.45)
Dmorocco	-0.253	-0.477	0.216	-0.619	-0.634	-0.092

Table 6.3 (Continued)

	(-0.99)	(-1.29)	(0.85)	(-1.32)	(-1.25)	(-0.18)
Doman	-0.382*	-0.342	-0.088	-0.555**	-0.181	-0.561**
	(-1.49)	(-1.22)	(-0.48)	(-1.70)	(-0.85)	(-1.80)
Dpalestine	-3.156	-3.228	-1.633	-4.521	-4.250	-2.946
	(-0.09)	(-0.09)	(-0.09)	(-0.09)	(-0.09)	(-0.09)
Dqatar	-0.566**	-0.532*	0.086	-1.059***	-0.693**	-0.266
	(-1.66)	(-1.46)	(0.28)	(-1.99)	(-1.77)	(-0.99)
Dsaudi	-0.362*	-0.549***	0.194	-0.680***	-0.662***	-0.141
	(-1.63)	(-1.98)	(1.29)	(-3.16)	(-2.02)	(-0.89)
DUAE	-0.672***	-0.743***	-0.208	-1.235***	-1.060***	-0.579***
	(-3.32)	(-3.27)	(-1.29)	(-4.64)	(-4.55)	(-2.09)
TANTA	0.339***	0.454***	-0.026	0.438***	0.540***	(0.016**
	(3.47)	(3.58)	(-0.37)	(4.22)	(4.52)	(1.67)
INTANTA	1.736***	1.303***	0.429*	1.803***	2.098***	-0.347
	(3.03)	(3.19)	(1.49)	(3.96)	(3.99)	(-0.59)
LNS	0.127***	0.130***	0.043***	0.083***	0.087***	0.080***
	(5.65)	(5.05)	(2.22)	(2.03)	(2.13)	(2.07)
SDOE	-0.059	-0.124	-0.049	-0.180**	-0.254***	-0.059
	(-0.46)	(-1.40)	(-0.44)	(-1.78)	(-2.03)	(-0.46)
EBITTA	-1.540***	-1.611***	0.139	-0.847	-1.088*	-0.496
	(-3.01)	(-2.26)	(0.30)	(-1.42)	(-1.48)	(-1.03)

The sample size is from 624-1108. The significance levels of the TOBIT model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.3a

Estimated Coefficients for the Third Hypothesis in Both Tax Arab Countries and Non-Tax Arab Countries

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using OLS. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 NDTS * DTAX + \beta_2 NDTS * NDTAX + \beta_3 MTR + \beta_4 DIVNI + \beta_5 MB + \beta_6 GOV + \beta_7 FAM + \beta_8 DBAHRAIN + \beta_9 DJORDAN + \beta_{10} EGYPT + \beta_{11} DKUWAIT + \beta_{12} DLEBANON + \beta_{13} DMOROCCO + \beta_{14} DOMAN + \beta_{15} DPALESTINE + \beta_{16} DQATAR + \beta_{17} DSAUDI + \beta_{18} DUAE + \beta_{19} TANTA + \beta_{20} INTANTA + \beta_{21} LNS + \beta_{22} SDOE + \beta_{23} EBITTA + \varepsilon$$

	TDBV	LTDBV	STDBV	TDMV	LTD MV	STD MV	VIF
Intercept	-0.889*** (-2.75)	-0.672*** (-2.25)	-0.141 (-1.17)	0.305 (0.73)	0.315 (0.86)	-0.105 (-0.43)	0
NDTSTAX	0.035 (0.03)	-0.385 (-0.4)	0.064 (0.16)	-1.058 (-0.78)	-1.520 (-1.28)	0.981 (1.22)	2.576
NDTSNONTAX	1.037*** (2.54)	0.451 (1.19)	-0.128 (-0.84)	-0.494 (-0.93)	-0.352 (-0.77)	0.426 (1.37)	1.654
MTR	0.625*** (3.09)	0.249 (1.33)	0.401*** (5.30)	0.912*** (3.48)	0.409** (1.79)	0.396*** (2.57)	1.417
MTRDIV	-1.552*** (-2.63)	-0.976** (-1.79)	-0.604*** (-2.74)	-2.308*** (-3.03)	-0.923 (-1.39)	-1.445*** (-3.22)	2.061
DIVNI	-0.108 (-1.37)	-0.176*** (-2.42)	0.044* (1.52)	-0.107 (-1.06)	-0.248*** (-2.80)	0.131*** (2.19)	1.853
MB	0.049*** (3.06)	0.046*** (3.10)	0.010** (1.67)	-0.054*** (-2.59)	-0.0359*** (-1.96)	-0.028*** (-2.30)	1.167
GOV	0.281** (1.76)	0.174 (1.18)	0.104** (1.75)	0.301* (1.46)	0.067 (0.37)	0.221** (1.83)	2.393
FAM	0.491*** (3.00)	0.342*** (2.26)	0.135*** (2.21)	0.463*** (2.19)	0.238 (1.29)	0.252*** (2.03)	2.462
Dbahrain	-0.561*** (-2.91)	-0.484*** (-2.72)	-0.096 (-1.34)	-1.000*** (-4.01)	-0.664*** (-3.06)	-0.345*** (-2.36)	9.558
Degypt	-0.572*** (-2.93)	-0.575*** (-3.19)	-0.040 (-0.55)	-0.761*** (-3.02)	-0.556*** (-2.53)	-0.191 (-1.29)	7.253
Djordan	-0.471*** (-2.38)	-0.404*** (-2.21)	-0.064 (-0.87)	-0.540*** (-2.11)	-0.254 (-1.14)	-0.303*** (-2.01)	3.614
Dkuwait	-0.502*** (-2.70)	-0.429*** (-2.49)	-0.057 (-0.83)	-0.884*** (-3.67)	-0.583*** (-2.78)	-0.338*** (-2.39)	10.777
Dlebanon	-0.346 (-1.20)	-0.344 (-1.3)	-0.002 (-0.02)	-0.574* (-1.54)	-0.419 (-1.30)	-0.220 (-1.01)	1.696
Dmorocco	-0.399 (-1.25)	-0.341 (-1.16)	-0.048 (-0.4)	-0.757** (-1.84)	-0.480 (-1.34)	-0.307 (-1.27)	1.394

Table 6.3a (Continued)

Doman	-0.431*** (-2.1)	-0.348** (-1.84)	-0.083 (-1.08)	-0.575*** (-2.16)	-0.233 (-1.01)	-0.374*** (-2.40)	3.618
Dpalestine	-0.347 (-1.17)	-0.313 (-1.14)	-0.055 (-0.5)	-0.902*** (-2.35)	-0.567 (-1.70)	-0.350* (-1.55)	1.806
Dqatar	-0.548*** (-2.10)	-0.481*** (-1.99)	-0.084 (-0.86)	-0.966*** (-2.85)	-0.644*** (-2.19)	-0.346** (-1.74)	1.868
Dsaudi	-0.358*** (-1.98)	-0.402*** (-2.41)	0.077 (1.14)	-0.673*** (-2.88)	-0.523*** (-2.57)	-0.132 (-0.97)	12.264
DUAE	-0.510*** (-2.65)	-0.458*** (-2.58)	-0.079 (-1.11)	-1.003*** (-4.04)	-0.680*** (-3.14)	-0.302*** (-2.07)	7.845
TANTA	0.183** (1.85)	0.198*** (2.17)	-0.005 (-0.14)	0.285*** (2.23)	0.314*** (2.82)	-0.006 (-0.09)	1.239
INTANTA	1.099*** (2.91)	1.049*** (3.00)	0.052 (0.37)	1.704*** (3.48)	1.918*** (4.51)	-0.260 (-0.91)	1.207
LNS	0.077*** (5.15)	0.064*** (4.66)	0.008* (1.46)	0.037** (1.94)	0.023 (1.39)	0.022** (1.95)	1.841
SDOE	0.016 (0.27)	-0.008 (-0.14)	0.016 (0.71)	-0.085 (-1.08)	-0.089 (-1.29)	0.010 (0.22)	1.275
EBITTA	-1.109*** (-2.96)	-0.735*** (-2.12)	-0.082 (-0.59)	-0.557 (-1.15)	-0.315 (-0.75)	-0.680*** (-2.39)	1.884
F	7.32***	4.53***	5.15***	5.07***	1.02***	3.24***	
RSQUARE	0.40	0.30	0.36	0.32	0.27	0.23	

The sample size is from 624-1108. The significance levels of the OLS model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.4

Estimated Coefficients for the Seventh Hypothesis in Both Tax Arab Countries and Non-Tax Arab Countries

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using maximum likelihood and a censored Tobit model. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 DBAHRAIN + \beta_2 DJORDAN + \beta_3 EGYPT + \beta_4 DKUWAIT + \beta_5 DLEBANON + \beta_6 DMOROCCO + \beta_7 DOMAN + \beta_8 DPALESTINE + \beta_9 DQATAR + \beta_{10} DSAUDI + \beta_{11} DUAE + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTDMV	STDMV
Intercept	0.332* (1.55)	0.106 (0.99)	0.268* (1.46)	0.578*** (3.96)	0.280* (1.63)	0.065 (0.86)
Dbahrain	-0.196 (-1.08)	-0.041 (-0.84)	-0.829*** (-5.44)	-0.584*** (-2.01)	-0.358** (-1.83)	-0.627*** (-2.50)
Degypt	-0.229 (-1.32)	-0.076 (-1.01)	-0.955*** (-2.20)	-0.471*** (-1.99)	-0.237 (-1.27)	-0.724*** (-2.22)
Djordan	-0.097 (-1.06)	0.004 (0.04)	-0.488*** (-4.51)	-0.355** (-1.77)	-0.156 (-0.99)	-0.303** (-1.69)
Dkuwait	-0.279 (-1.38)	-0.205 (-1.10)	-0.624*** (-4.88)	-0.502*** (-2.18)	-0.357*** (-1.96)	-0.424*** (-2.47)
Dlebanon	-0.189 (-1.00)	-0.113 (-0.81)	-0.682*** (-1.97)	-0.210 (-0.87)	-0.067 (-0.68)	-0.428* (-1.63)
Dmorocco	-0.289 (-0.97)	-0.507 (-1.28)	-0.446 (-1.28)	-0.519 (-1.40)	-0.646* (-1.46)	-0.238 (-0.95)
Doman	-0.230 (-1.07)	-0.123 (-0.91)	-0.403*** (-1.96)	-0.384*** (-1.97)	-0.203 (-1.38)	-0.191 (-1.24)
Dpalestine	-0.466* (-1.58)	-0.214 (-1.01)	-0.641*** (-1.98)	-0.722*** (-2.14)	-0.404* (-1.56)	-0.429* (-1.60)
Dqatar	-0.193 (-0.95)	-0.015 (-0.09)	-0.411** (-1.73)	-0.241 (-1.31)	-0.065 (-0.77)	-0.186 (-0.84)
Dsaudi	0.207 (1.32)	0.122 (0.83)	-0.108 (-0.77)	-0.158 (-0.99)	-0.152 (-0.98)	0.111 (0.94)
DUAE	-0.454*** (-1.96)	-0.383** (-1.86)	-0.693*** (-4.66)	-0.802*** (-2.72)	-0.688*** (-2.00)	-0.479*** (-2.45)

The sample size is from 1115. The significance levels of the TOBIT model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and *Significant at the 0.10 level.

Table 6.4a

Estimated Coefficients for the Seventh Hypothesis in Both Tax Arab Countries and Non-Tax Arab Countries

The dependent variables are the total, long-term and short-term debt to equity ratios divided by both book and market values of equity. The explanatory variables are as in Table 4.2. The regression is estimated using OLS. The estimated model is:

$$\frac{D}{E} = \beta_0 + \beta_1 DBAHRAIN + \beta_2 DJORDAN + \beta_3 EGYPT + \beta_4 DKUWAIT + \beta_5 DLEBANON + \beta_6 DMOROCCO + \beta_7 DOMAN + \beta_8 DPALESTINE + \beta_9 DQATAR + \beta_{10} DSAUDI + \beta_{11} DUAE + \varepsilon$$

Ind. Variables	TDBV	LTDBV	STDBV	TDMV	LTMV	STDMV	VIF
Intercept	0.447*** (2.88)	0.227** (1.80)	0.492*** (5.21)	0.505*** (3.26)	0.255*** (1.99)	0.249*** (2.61)	0
Dbahrain	-0.142 (-0.84)	0.049 (0.36)	-0.465*** (-4.48)	-0.333*** (-1.96)	-0.102 (-0.73)	-0.231*** (-2.20)	5.613
Degypt	-0.246* (-1.53)	-0.073 (-0.56)	-0.453*** (-4.62)	-0.252* (-1.57)	-0.041 (-0.31)	-0.204*** (-2.05)	12.471
Djordan	-0.122 (-0.78)	0.010 (0.08)	-0.392*** (-4.09)	-0.185 (-1.18)	-0.003 (-0.03)	-0.150* (-1.55)	23.242
Dkuwait	-0.270** (-1.67)	-0.084 (-0.64)	-0.459*** (-4.66)	-0.297** (-1.84)	-0.081 (-0.61)	-0.215*** (-2.16)	11.476
Dlebanon	-0.264 (-1.23)	-0.073 (-0.42)	-0.464*** (-3.55)	-0.105 (-0.49)	0.090 (0.51)	-0.196* (-1.48)	2.068
Dmorocco	-0.404 (-1.2)	-0.189 (-0.69)	-0.487*** (-2.39)	-0.446 (-1.33)	-0.201 (-0.73)	-0.244 (-1.18)	1.269
Doman	-0.191 (-1.14)	-0.041 (-0.30)	-0.318*** (-3.13)	-0.173 (-1.04)	0.006 (0.05)	-0.076 (-0.74)	6.651
Dpalestine	-0.293 (-1.36)	-0.074 (-0.42)	-0.491*** (-3.75)	-0.369** (-1.72)	-0.120 (-0.68)	-0.248** (-1.88)	2.068
Dqatar	-0.157 (-0.81)	0.005 (0.03)	-0.382*** (-3.22)	-0.043 (-0.22)	0.085 (0.53)	-0.128 (-1.07)	2.679
Dsaudi	0.057 (0.36)	0.056 (0.43)	-0.233*** (-2.39)	-0.069 (-0.44)	-0.032 (-0.24)	0.013 (0.13)	13.737
DUAE	-0.274* (-1.63)	-0.071 (-0.52)	-0.475*** (-4.63)	-0.422*** (-2.52)	-0.190 (-1.37)	-0.232*** (-2.23)	6.255
F	4.16***	1.44*	7.41***	3.41***	1.56**	6.03***	
RSQUARE	0.04	0.02	0.07	0.04	0.02	0.06	

The sample size is from 1115. The significance levels of the OLS model estimated coefficients are for the two-tailed test based on *a priori* predictions. T values are given in parentheses. ***Significant at the 0.01 level, **Significant at the 0.05 level, and

*Significant at the 0.10 level.

CHAPTER VII

CONCLUSIONS

7.1 Benefits and Uniqueness

This dissertation set out to explore the determinants of capital structure in the Arab business environment. The purpose of this exploration is to test the models of capital structure in an environment different from where they were developed, i.e. Western economies. The tests include the tax, agency, country of origin, and information asymmetry models of capital structure theory. The general finding is that capital structure theory is not as robust as was previously thought.

This dissertation is unique in that:

- 1- It is the first work to test capital structure theory in countries that do not have tax regimes in place.
- 2- It is the first work that empirically tests CS theory in Arab countries. It is also one of the few studies to tackle these issues outside the US, much less in developing countries.
- 3- It utilizes a unique database assembled by the author from several data sources.
- 4- It is one of the few to use TOBIT “maximum likelihood estimation.” Despite the fact that similar tests suffer from the limited dependent variable, empirical studies usually fail to accommodate this problem.
- 5- It opened the way for many new research ideas to answer the puzzling question of

how firms choose their capital structures.

7.2 Summary of the Major Results

The findings of this dissertation are:

- 1- Tax models of capital structure are supported by empirical evidence from economies that are different from Western economies. More specifically:
 - a- Firms operating in countries that have a tax system in place utilize more debt than those operating in countries that do not have a tax system.
 - b- The marginal tax rate is positive and significant. To benefit from debt tax shields, firms with higher MTR utilize more debt than those with lower MTR.
 - c- Non-debt tax shield is a positive and significant determinant of capital structure for firms operating in countries that do not have a tax system. This is inconsistent with the tax hypothesis but may be due to NDTs proxying for collateral. However, for firms operating in countries that have a tax system and firms with high MTR, NDTs is negative but not significant. This implies that NDTs may be a substitute for DTS in tax countries as expected.
 - d- Personal taxes have a significant negative effect on the firm's level of leverage, implying that firms do take personal taxes into account when they make capital structure decisions. This is especially true in economies where the tax differential between interest income and dividend and capital gains income is substantial.
- 2- Agency models of capital structure are not supported by evidence from the Arab

world. This implies that the agency theory is not as relevant in the Arab world as it is in Western economies. Specifically,

- a- The manager/shareholder agency conflict is not significant in the Arab world because the family that owns the majority of the firm's stock is also the managing team of that company. Furthermore, there is a positive relationship between the firm's level of leverage and the level of managerial ownership. This contradicts the finding of the studies in Western economies. This positive relationship is explained by the owning family's desire to keep control of the firm. This is accomplished by using debt rather than equity to avoid diluting ownership.
 - b- Government ownership is not significant. This implies that that the argument of government assurance to debt holders does not hold. This is either because the government monitoring is weak (due to administrative weaknesses in these governments) or because the lenders know that these governments are privatizing their firms. In both cases the value of government backing and assurance is insignificant.
 - c- The shareholder/debt holder agency conflict is not significant in the Arab world. The main reason for this lack of conflict is that banks (the majority debt holders) are also shareholders of the firm. The market-to-book ratio is positive and significant because, due to Arab world specific factors, it is a proxy for good future prospects.
- 3- Information asymmetry theory is not supported by evidence from Arab economies. Due to factors that were analyzed extensively, Arab firms follow a reverse POH. No formal test was conducted and these results are tentative; such

a test is contingent on the availability of longer time series data.

- 4- The country of origin is a significant determinant of capital structure. This lends the strongest support to the assumed weakness of capital structure theory.

Furthermore, due to Arab-specific factors (other than the ones that are included in the models above), Arab firms use significantly less leverage than comparable Western firms. The country dummies that represent the country-specific factors are expected to lose significance once the models control for these factors.

With regard to the control variables this dissertation documents several findings:

- 1- Dividend payout is negative and significant. Among the many implications of dividends, they are a sign of commitment to shareholders, not to debt holders. Consistent with the weak law country argument, this is especially true in the Arab world and supports the fact that dividends play an important role in the capital structure decision and that dividend clienteles exist.
- 2- Collateral is significantly positive. Collateral is especially important in the Arab world because most debt is in the form of bank loans. Intangible assets are also positive and significant. Due to Arab factors, intangible assets are not a sign of lack of collateral; they are rather a sign of reputation and promising future prospects.
- 3- Size is positive and significant. The perception that size is a sign of strength and a proxy for decreased bankruptcy risk applies to Arab economies too.
- 4- Volatility is negative but not always significance. This is due to the short time series that is used to calculate firms' volatilities. The negative sign is due to the fact that debt is mostly in the form of bank loans and the fact that banks choose the more stable firms.

- 5- Profitability is negative and significant. This is due to the fact that profitable firms use less external financing. However, it is expected that equity financing may have a stronger negative relationship with profitability since it is the second highest source of Arab firms' financing.

Control variable estimates in the Arab world agree with those in Western economies, but for different reasons in some cases. Table 7.1 presents a summary of the findings of this dissertation and a comparison with the findings in Western economies.

7.3 Implications for Future research

This dissertation triggered many topics for future research, referred to in the various chapters. The following is a summary of the more important issues that warrant future research:

- 1- The country dummies tested the collective effects of the institutional factors on the level of leverage. To understand capital structure decisions, we need to test the implications of these factors individually.
- 2- The POH test is weak. A test similar to Shyam Sunder and Myers (1999) is more appropriate. More data is needed to conduct a comprehensive test of the POH in the Arab world.
- 3- Tax theories can be further tested through the use of event studies. For example, Oman passed its tax law in 1994; investigating the change in the level of leverage around that year should lend some insight to the tax model of capital structure. Also the change in magnitude, sign, and level of significance of NDTS and payout ratio would shed light on the effect of taxes on capital structure.

- 4- Further investigation of the total tax benefit/burden of corporate and personal taxes at the various corporate and personal tax brackets will be of great benefit to arrive at the optimal level of leverage for each combination of these tax brackets.
- 5- More data is needed to test the models of capital structure that were not tested in this dissertation. The product/input model and the market for corporate control are the two that were not tested in this dissertation.
- 6- Business risk (volatility) and short-term growth (annual capital expenditure) roles need to be given more attention. For example, we need to consider other measures of business risk.
- 7- Other institutional factors and country traditions that were not tested in the Western economies need to be identified, proxied for, and tested to find an answer to Myers (1984) puzzle.

Finally, this dissertation is a genuine attempt to expand the theory of capital structure and to research new methods and approaches to equip it with the needed rigor to cope with new and dynamic environments. The findings are unique and helpful for future research.

Table 7.1

Comparison of the Estimated Coefficients for the Determinants of Corporate Borrowing
for Arab and for Unanimous Findings in Western Economies

Arab Countries			Western Countries	
Variable	Direction	Significance	Direction	Significance
Corporate Taxes	+	Yes	+	Yes
NDTS	+	Yes	+/-	Yes
Growth	+	Yes	-	Yes
DIVNI	-	Yes	-	Yes
Collateral	+	Yes	+	Yes
Size	+	Yes	+	Yes
Volatility	-	Yes	-	Yes
Profitability	-	Yes	-	Yes
Dividends	-	Yes	-	Yes
Personal Taxes	-	Yes	-	Yes

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