THE EFFECTS OF ECONOMIC CONDITIONS AND FINANCIAL MARKET DEVELOPMENT ON THE CAPITAL STRUCTURE OF FIRMS

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EMRE BAŞARAN

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Doç.Dr. Mesut Murat ARSLAN
Manager of Institute

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy.

Doç.Dr. Ayhan KAPUSUZOĞLU
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Doctor of Philosophy.

Prof.Dr. Nildağ Başak CEYLAN
Supervisor

Examining Committee Members

Prof. Dr. Mehmet Baha KARAN	(HU, Management)	
Prof.Dr. Nildağ Başak CEYLAN	(YBU, Banking and Finance)	
Prof.Dr. Dilek DEMİRBAŞ	(İU, Economics)	
Doç.Dr. Ayhan KAPUSUZOĞLU	(YBU, Banking and Finance)	
Yrd.Doç.Dr. Erhan ÇANKAL	(YBU, Banking and Finance)	

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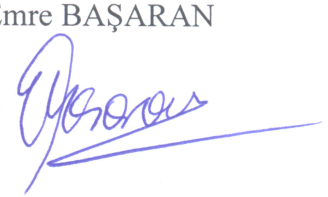
Name, Last name: Emre BAŞARAN

Signature : 

ABSTRACT

THE EFFECTS OF ECONOMIC CONDITIONS AND FINANCIAL MARKET DEVELOPMENT ON THE CAPITAL STRUCTURE OF FIRMS

Başaran, Emre

Ph.D., Department of Banking and Finance

Supervisor: Prof. Dr. Nildağ Başak Ceylan

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This thesis aims to provide a cross-country comparison of the factors that affect the capital structure decisions of firms. The significance of firm-specific variables, the country-specific variables, and the industry of the firms is investigated by constructing a panel data set from a sample of firms operating in 14 countries. In order to analyze the significance of the country-specific factors which are time-invariant, Hausman-Taylor method of analysis has been implemented together with the fixed-effects model.

The analyses of the whole sample, regions, and the countries demonstrate that the firm-specific variables are the right proxies for the parameters set forth in the theoretical framework. The research results suggests that the financing decisions of firms are highly influenced by the features of the banking system and the size of the stock market. In this study, it is demonstrated that well-functioning legal system facilitates borrowing. It is also proved empirically that the increasing transparency of firms leads to more equity financing and less debt usage. The analysis of pooled data with the aggregate tax rate implies that the firms use more debt in order to benefit from tax advantages as trade-off theory predicts.

It is suggested that more accurate data and analysis is needed for developing countries. The conflicts between the different theories of capital structure can be resolved with the analysis of samples from countries bearing distinct features.

Keywords: Capital structure, leverage, financial distress

ÖZET

EKONOMİK KOŞULLAR İLE MALİ PİYASALARIN GELİŞMİŞLİĞİNİN FİRMALARIN SERMAYE YAPISI KARARLARINA ETKİLERİ

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Tez firmaların sermaye yapısı kararlarını etkileyen faktörlerin uluslararası karşılaştırmasını yapmayı amaçlamaktadır. 14 ülkede faaliyet gösteren firma örnekleminden panel veri seti oluşturularak firmaya özgü değişkenler, ülkeye özgü değişkenler ve firmanın bulunduğu endüstrinin anlamlılığı incelenmiştir. Zaman içerisinde sabit ülkeye özgü değişkenlerin anlamlılığını analiz etmek amacıyla sabit etkiler modeliyle birlikte Hausman-Taylor analiz metodu uygulanmıştır.

Bütün örneklemin, bölgelerin ve ülkelerin analizi firmaya özgü değişkenlerin teorik çerçevede ortaya konan parametreler açısından uygun vekil değişkenler olduğunu göstermiştir. Çalışma sonuçları firmaların finansman kararlarının bankacılık sisteminin yapısı ve hisse senedi piyasasının büyüklüğünden etkilendiğini önermektedir. Bu çalışmada iyi işleyen bir hukuk sisteminin borçlanmayı kolaylaştırıldığı ortaya konmuştur. Ayrıca firmaların şeffaflığının artmasıyla özsermayenin artıp borçlanmanın azalacağı ampirik olarak ispatlanmıştır. Birleştirilmiş verinin genel vergi oranı kullanılarak analizi, dengeleme teorisinin önermesi doğrultusunda firmaların vergi avantajından daha fazla yararlanmak için daha fazla borç kullanabildiği sonucunu göstermiştir.

Çalışma sonucunda gelişmekte olan ülkeler için daha fazla tutarlı veriye ve analize ihtiyaç olduğu belirtilmiştir. Farklı sermaye yapısı teorilerinin arasındaki karşıtlık farklı nitelikteki ülkelerden oluşturulan örneklemlerin analizi ile çözülebilecektir.

Anahtar Kelimeler: Sermaye yapısı, kaldıraç, finansal zorluk

To My Wife

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CHAPTER 1

INTRODUCTION

In literature, there is a huge number of studies that focus on firm-specific determinants of capital structure decisions of firms. Since Miller-Modigliani's seminal work published in 1958, different theories have been developed in order to explain the factors that influence the debt usage of firms. In order to test the propositions of these theories empirically, the researchers construct variables that proxy for determinants of capital structure set forth by different theories. The previous research mostly focused on firm specific determinants of capital structure decisions of firms in developed countries which have sufficient amount of data. However, the low explanatory power of developed empirical models suggests that there are unobserved firm and country-specific parameters which may affect the capital structure decisions of firms. Some researchers have analyzed the effects of several country-specific parameters in the last decade with the help of data gathered in the developing countries. As the markets grow in developing countries, more firm and country specific data become available for the researchers. However, the lack of accurate time-series data in developing countries and endogeneity problem inherent in the models remains a challenge against the researchers who aim to develop a comprehensive model.

In this study, it is aimed to test the significance of both firm and country-specific determinants of capital structure decisions of firms in different countries. In order to obtain efficient estimates, data of firms from diverse industries in 14 countries is analyzed. Moreover, for the purpose of overcoming the endogeneity problem and testing more country-specific variables, Hausman-Taylor methodology is applied and compared with the fixed-effects methodology which has been widely used in the previous literature.

There are two main objectives in this research. First objective is to make cross-country comparison of the effects of variables that have sufficient amount of within-variation. The second objective is to measure the effects of variables that are time-invariant. The country-specific time-invariant variables are tested by pooling the data and applying Hausman-Taylor methodology.

In this research it is not aimed to develop a comprehensive model which includes every parameter affecting the capital structure. The endogeneity and high collinearity among the country-specific variables does not allow including every parameter in the model. Since the objective is to make international comparison of the effects of certain variables, the variables are grouped and the analysis is performed with different groups of variables separately.

The dissertation is presented in the following manner:

In Chapter 2, the capital structure theory is briefly summarized. After the well-known MM Propositions are explained, general information about the main theories developed through the studies of various researchers is given. The trade-off, agency costs, pecking order, and market timing theories and the two approaches derived from corporate control and product market strategies are explained briefly with empirical evidence supporting the theoretical framework.

In Chapter 3, general information is given about the firm-specific determinants of capital structure. The theoretical background in constructing firm-specific variables such as tax, tangibility, size, growth opportunities, profitability, volatility and industry are given in this chapter. The predictions of previous empirical studies about the effects of these firm-specific variables are explained in Chapter 3. This chapter denotes the reasons underlying the selection of firm-specific variables in this research.

In Chapter 4, the previous research focusing on cross-country comparison of capital structure models is explained in detail. In this chapter the country-specific variables that may influence debt ratios of firms are explained. The empirical evidence about the effects of these variables is presented in this chapter. Despite being out of the scope of this research, the empirical work which investigates the speed of adjustment towards target optimal capital structure is discussed briefly.

In Chapter 5, information about the sample and method of analysis is given. The information about the variables used in the model, and the sources of data for those variables are explained in this chapter. This chapter presents the rules followed in constituting the sample. The econometric model and the method of analysis are also described in Chapter 5. The detailed explanation of the methodology is presented in the Appendix B.

The results of the analysis are presented and interpreted in Chapter 6. The output of the software package (STATA 12.0) is compiled in tables and discussed in detail.

CHAPTER 2

THEORETICAL FRAMEWORK

The modern theory of capital structure has been founded on the seminal paper of Modigliani and Miller (1958). Modigliani and Miller (1958) developed the so-called MM model which demonstrates under what conditions the capital structure is irrelevant. Though the assumptions of MM model seem unrealistic for some researchers, MM model identifies a benchmark for the researchers who investigate the determinants of the capital structure. The first theoretical studies following Modigliani and Miller (1958) incorporated the tax considerations which lead to the trade-off theory. Another theory that has been developed by the studies of several researchers is the pecking order theory which takes asymmetric information and transaction costs into consideration. Other than these two main theories, there are capital structure models which can be classified into four groups regarding the determinants considered (Harris and Raviv, 1991). One group of models considers the conflicts of interests among various stakeholders with claims to the firm's resources. This group of research which was initiated by Jensen and Meckling (1976) considers mainly the agency costs, i.e. costs due to conflicts of interest. Second group of research depends on the assumption that the capital structure is designed to mitigate the inefficiencies in the firm's investment decisions that are caused by the asymmetry of information. Ross (1977), Leland and Pyle (1977), Myers and Majluf (1984), and Myers (1984) are primary work in this group. The third group of models according to Harris and Raviv (1991) are based on the product/input market interactions. This class of work addresses the relationship between a firm's capital structure and the characteristics of its product or inputs as well as its competition strategy in the market. The last group involves the studies that focus on the relationship between the corporate control and the capital structure. Following the

increasing takeover activities in the 1980's, this group of research depends on the fact that common stock carries voting rights while debt does not.

In this chapter, the capital structure theory is briefly summarized. After the well-known MM Propositions are explained, general information about the main theories developed through the studies of various researchers is given.

2.1.The Modigliani-Miller Model: Capital Structure Irrelevance

2.1.1.Propositions and Their Interpretations

The modern theory of capital structure began when Modigliani and Miller (1958, 1963) published their seminal papers on the cost of capital, corporate valuation, and capital structure. Though Rubinstein (2006) cites Williams (1938) as the first to define the capital structure irrelevance proposition, Modigliani and Miller (1958) provided the first formal analysis of capital structure irrelevance.

In developing their propositions, they assumed either explicitly or implicitly the following:

a. Capital markets are frictionless.
b. Individuals can borrow and lend at the risk free rate.
c. There are no costs to bankruptcy or to business disruption.
d. Firms issue only two types of claims: risk-free debt and risky equity.
e. All firms are assumed to be in the same operating risk class.
f. Corporate taxes are the only form of government levy. (i.e., there are no wealth taxes or personal taxes.)
g. All cash flow streams are perpetuities.
h. There is no asymmetry of information between corporate insiders and outsiders.
i. Managers always maximize shareholders' wealth. (i.e., no agency costs)
j. Operating cash flows are completely unaffected by changes in capital structure.

Using these assumptions seeming unrealistic for many researchers, they derived the following equation:

$$V_L = V_U + \tau_C B \quad (1)$$

where V_L and V_U refer to the value of the levered and unlevered firm respectively, and the term $\tau_c B$ is the tax shield provided by the debt. This is one of the most important derivations made in the theory of corporate finance in the last 50 years which is known as *Modigliani-Miller Proposition I*. With Proposition I Modigliani and Miller assert that without market imperfections including corporate taxes the value of the firm is completely independent of the type of financing. In other words, the market value of the firm is independent of its capital structure in perfect and complete capital markets, and is calculated by capitalizing its expected return at the rate ρ appropriate to its risk class. (Copeland, Weston, and Shastri, 2005)

Modigliani and Miller (1958) assumed arbitrage-free equilibrium in their proof, which was criticized by other researchers later on. They asserted that if Proposition I did not hold, then investors could exploit arbitrage opportunities and increase their wealth without any cost through short-selling overpriced stock and buying equivalent underpriced stock having identical income streams (Cheremushkin, 2011). Durand (1959) finds the MM's equilibrating mechanism in an imperfect market unrealistic. Durand (1959) argues that since investors and corporations are subject to restrictions in their operations, they should adjust their capital structure in order to gain profit from market fluctuations. In their reply to Durand's counterargument Modigliani and Miller (1959) argue that the capital structure irrelevance proposition describes the general tendency of the real world capital market. They assert that there is abundant evidence about the difficulty of outguessing the market consistently. Therefore, they claim the corporation managers should not give major consideration to the possible windfall gains (or losses) in determining their capital structures.

Proposition II concerns the rate of return on common stock of the companies which has debt in their capital structure. In their second proposition, Modigliani and Miller

(1958) derive the expected rate of return or yield, i, on the stock of any company j belonging to the kth class as a linear function of leverage as follows:

$$i_j = \rho_k + (\rho_k - r)\frac{D}{E} \quad (2)$$

Based on Equation 2, MM Proposition II shows that the cost of equity depends on the required rate of return of firm assets (ρ_k or Weighted Average Cost of Capital), firm's cost of debt (r), and firm's debt-equity ratio (D/E). Thus, MM Proposition II without tax consideration indicates that the cost of equity is a positive linear function of the firm's capital structure.

On the basis of first two propositions with respect to cost of capital and financial structure Modigliani and Miller (1958) derived Proposition III which defines the optimal investment policy by the firm. According to Proposition III if a firm in risk class k is acting in the best interest of the stockholders at the time of the decision, it will exploit an investment opportunity if and only if the rate of return on the investment is larger than WACC. That is, the cut-off point for investment in the firm will in all cases be WACC and will be completely unaffected by the type of security used to finance the investment. This proposition was relatively controversial for some researchers. Kumar (1974) presents the restrictions for MM Proposition III to hold. Greenberg et al. (1978) demonstrate the interaction of the firm's operating environment and the risk-return preferences of the financial market in the determination of the firm's value-maximizing behavior. Peterson, and Benesh (1983) indicate empirically that there is a relation between financing and investment decisions, and conclude that market imperfections are of sufficient magnitude to lead to jointly-determined investment and financing decisions.

2.1.2.Tax Advantages and Bankruptcy Costs

The effect of tax benefits on a firm's market value seems controversial to financial economists. Tax deductibility of interest expense on debt causes a flow of tax savings,

which increases a firm's value (Cheremushkin, 2011). In the first version of the cost of equity formula for a levered firm Modigliani and Miller (1958) implicitly assume tax savings are discounted at cost of unlevered equity. Modigliani and Miller (1963) amend this version by assuming that the tax savings are discounted at the cost of debt and the cost of levered equity formula is modified as follows:

$$i_j = \rho_k + (\rho_k - r)(1 - \tau_c)\frac{D}{E} \quad (3)$$

where τ_c is the effective corporate income tax rate. Modigliani and Miller (1963) still keep the assumption of risk-free debt, and assume that the tax savings are revenues without risk. Equation 3 still implies a positive linear relationship between the cost of equity and leverage, but includes the tax advantages of debt financing.

In the Modigliani and Miller (1963) version, the assumptions about the riskiness of the tax savings constitute the key issue since the changes in the tax code, and financing policies, loss of non-debt tax shields, and firm-specific policies regulated by tax law provisions (e.g., loss carry-backs and carry-forwards) make the tax savings risky. Therefore, Modigliani (1988) expresses a more general formula with a discount rate for tax savings varying from the risk-free cost of capital to the cost of unlevered equity or even higher.

After Modigliani and Miller (1963), the major contribution to the tax related research was made by Miller (1977). The author incorporated the personal taxes into the theory in addition to corporate taxes. In his formulation, he demonstrated the way corporate and personal tax rates may work that vanishes the advantage of debt due to tax deductibility. As a matter of fact, tax-adjusted propositions of Modigliani and Miller (1963) eliminate the financing policy irrelevance. The value of the firm is not independent of financial leverage anymore regarding the tax-deductibility of interest payments. The tax advantages of debt financing rationalize the argument that managers should increase debt to produce as many tax benefits as possible. However, Miller (1977) claims that in equilibrium the value of a firm is still independent of its capital structure even when the interest payments are tax deductible. He asserts equilibrium market prices and returns

reflect the influence of personal and corporate taxes, and changing its debt-to-equity ratio has no impact on the firm's performance.

DeAngelo and Masulis (1980) contribute further by incorporating tax shields other than interest payments on debt such as depreciation, or investment tax credits in order to identify an optimal level of debt. They show that the probability of ending up with zero or negative earnings will increase when debt is utilized more, which causes the interest tax shield to decrease in expected value.

2.1.3.Empirical Evidence

Unfortunately, a direct empirical validation of MM model is not feasible due to the fact that the assumptions of the model are difficult to satisfy completely in real life. However, some studies attempt to provide indirect empirical validations by observing the distribution of leverage ratios across the economy. In these studies, the main hypothesis is that the leverage should be randomly distributed in an economy if the leverage decision had no impact. Modigliani and Miller (1958) explored the oil and electric utility industry, and presented that the relation of the weighted cost of capital with leverage was weak. However, Patterson (1983) shows for utility firms that there is a positive relationship between the value of the firm, and its use of debt only for low levels of leverage. For higher levels of leverage, the relationship between value and debt ratio is concave.

Some researchers tested the MM Propositions by controlling for factors that influence the propositions. Weston (1963), Boness and Frankfurter (1977), and Haugen and Kumar (1974) demonstrate that leverage decision is irrelevant when growth opportunities do not exist. Chittenden et al. (1996), and Chowdhury and Miles (1989) conclude empirically that there is a significant relation between profitability and leverage. This relation brings about questions about the separability of investment and financing decision since profit is an issue related to investment (Swanson, Srinidhi, and Seetharaman, 2003).

2.2.Trade-off Theory

2.2.1.Theoretical Framework

After Modigliani and Miller (1963) incorporated the tax advantages of debt into their model, a new discussion about where to stop borrowing had been initiated. Modigliani and Miller (1963) affirmed that despite the tax advantages of debt, the existing data did not indicate significant increase of debt usage in the high tax years. The authors explained this phenomenon with the need for preserving flexibility. They imply that the firms should maintain a substantial *reserve of untapped borrowing power*. This explanation ignited another discussion in the literature. Robichek and Myers (1966) argue that debt is disadvantageous when the present borrowing requires additional debt financing in future contingencies, and the cost of future financing is uncertain. The authors claim that this disadvantage is reinforced when bankruptcy is a possibility, and the cost of capital is higher than that of an unlevered firm in case of a bankruptcy. Therefore, they conclude that the firm acting in the best interest of its shareholders should utilize leverage at an optimum level where the present value of the tax rebate associated with a marginal increase in leverage is equal to the present value of the marginal cost of the disadvantages of leverage due to bankruptcy. Similarly, Hirshleifer (1966) note that the bankruptcy penalties should be considered as well as the tax advantages of debt in determining the optimal level of leverage. He utilized state preference approach in order to demonstrate that when the idealized conditions (e.g. no corporate taxes, no bankruptcy costs etc.) do not hold, there will in general be an optimal ratio of debt-to-equity. Kraus and Litzenberger (1973) introduce the tax advantage of debt and bankruptcy costs into the state preference framework as well. The authors demonstrate that the market value of a levered firm equals to market value of the unlevered firm plus the corporate tax rate times the market value of the debt minus complement of the corporate tax rate times the present value of the bankruptcy costs. Further work such as Baron (1975), Scott (1977), and Schneller (1980) help develop the trade-off theory which argues that firms should utilize debt up to a point

where the benefit of the tax deductibility of interest payment is offset against potential bankruptcy costs.

In fact, it is relatively straightforward to show how bankruptcy risk can affect firm value. Since the present value of the firm is equal to the expected cash flow divided by the weighted average cost of capital, the value of the firm is maximized at the lowest weighted average cost of capital. Utilizing more debt in the capital structure increases the bankruptcy risk, and the cost of debt as well. Accordingly, the weighted average cost of capital increases, and the firm value decreases. Though the influence of the bankruptcy on the firm value is not difficult to perceive, it is not that simple to model the bankruptcy costs theoretically since they are only measurable indirectly or as the result of future probabilistic events. Schneller (1980) refers to three aspects of bankruptcy costs: increased interest costs, loss of future tax deductibility, and the occurrence of bankruptcy costs. Altman (1984) classifies the bankruptcy costs in two categories. He calls the legal, accounting, filing and other administrative costs due to bankruptcy as direct costs. According to Altman (1984) the indirect costs are related to the lost profits due to the potential of bankruptcy. The lost opportunities, abnormal loss of sales, and cost of loss in managerial energy are some of the indirect costs that Altman (1984) refers to, and attempts to measure quantitatively.

While defining the costs of bankruptcy is simple, the incorporation of bankruptcy into the capital structure paradigm renders theoretical complexity. Leland (1994) and Leland and Toft (1996) modeled the value of the firm by assuming that the present value of the bankruptcy costs and the present value of the lost interest tax shields are affected by the firm's capital structure choice. In their model they identify an optimal capital structure which is determined by a trade-off between the value created by the present value of the interest tax shield, and the lost value due to the present value of the bankruptcy costs and the present value of the lost interest tax shields in case of bankruptcy. Bradley, Jarrell and Kim (1984) develop a single period model, and demonstrate that the firm's optimal leverage decision involves setting B, the end-of-period payment promised to bondholders,

such that the market value of the firm is maximized. Mathematically, the following equation should be equal to zero in order to maximize the value of the firm.

$$\frac{\partial V}{\partial B} = \left(\frac{1-\tau_{pb}}{1+r_f}\right)\left\{\begin{array}{c}[1-F(B)]\left[1-\frac{(1-\tau_c)(1-\tau_{ps})}{(1-\tau_{pb})}\right]- \\ \frac{(1-\tau_{ps})\tau_c}{(1-\tau_{pb})}\left[F\left(B+\frac{\emptyset}{\tau_c}\right)-F(B)\right]-kBF(B)\end{array}\right\} \quad (4)$$

Where τ_c is the constant marginal tax rate on corporate income, τ_{pb} is the progressive tax rate on investor bond income, τ_{ps} is the tax rate on investor equity income, k is the fraction of end-of-period value that is lost if the firm defaults on debt, ϕ is the total after-tax value of nondebt tax shields if fully used, r_f is the risk-free rate, and $F(\cdot)$ is the cumulative probability density function. The main predictions from the model are found by redifferentiating the first-order condition with respect to each of the parameters of interest (Frank and Goyal, 2008). The implications derived from the model are as follows:

1. An increase in the costs of financial distress (k) reduces the optimal debt level.
2. An increase in nondebt tax shields (ϕ) reduces the optimal debt level.
3. An increase in the personal tax rate on equity (τ_{ps}) increases the optimal debt level.
4. At the optimal capital structure, an increase in the marginal bondholder tax rate (τ_{pb}) decreases the optimal level of debt.

The first implication of Bradley, Jarrell and Kim (1984) model has several interpretations. First, large firms should have more debt because they are more diversified and have lower default risk (Miglo, 2011). Second, tangible assets suffer a smaller loss of value when firms go into distress. Therefore, leverage should be positively correlated with asset tangibility, and negatively correlated with R&D intensiveness. Third, high-growth firms tend to lose more of their value than low-growth firms when they go into financial distress. Thus, trade-off theory predicts a negative relationship between debt financing and growth.

Some researchers add dynamic aspects to single period trade-off models. In a dynamic model the expectations in the future periods and the transaction costs are taken into consideration. The rationale for incorporating dynamics into the trade-off theory is

that the correct financing decision of a firm depends on the financing margin that the firm anticipates in the next period. A highly profitable firm has more than one choice about utilization of the profit. It can distribute the excess fund to its shareholders in the current period or it can retain the funds in order to finance the available investment opportunities in the next periods. The dynamic models attempt to analyze the determinants of this kind of decisions by considering the expectations about future tax levels and returns of investment opportunities as well as the transaction costs. The first dynamic models are by Kane et al. (1984) and Brennan and Schwartz (1984). Both studies analyzed continuous time models with uncertainty, taxes, and bankruptcy costs, and assumed no transaction costs. In their model firms react to adverse shocks immediately by recapitalizing without any transaction costs, therefore maintain high levels of debt in order to exploit the interest tax shield. Fischer, Heinkel and Zechner (1989) introduced transaction costs into the analysis of dynamic capital structures. The authors claim that in a dynamic setting, debt ratio observations are not adequate measures of the firm's capital structure policy. They suggest that the debt ratio range is a more relevant measure of a firm's dynamic debt policy. Because of transaction costs, the firm allows its capital structure to drift between an upper and lower limit. When its leverage gets close to those limits, the rebalancing takes place. When the firm earns profits, it pays down debt. If the lower leverage limit is reached, the firm recapitalizes. If the firm loses money so that debt increases, it will again allow the drift until the boundary is reached.

2.2.2.Empirical Evidence

Since the most prominent contribution of the trade-off theory is the incorporation of the bankruptcy costs into the model, several researchers seek evidence for the significance of the bankruptcy costs. Warner (1977) examine 11 railroad companies' bankruptcies, and measure only direct costs such as lawyers' and accountants' fees, and the value of managerial time spent in administering the bankruptcy. He finds that the direct costs were trivial averaging 1 percent of firm value over the seven years before the bankruptcy and

rising to 5.3 percent in the year of the bankruptcy. Furthermore, the direct costs seem to decline with size of the firm. Ang, Chua and McConnell (1982) examine the direct administrative costs of bankruptcy for a randomly-selected sample of corporations which declared bankruptcy in the Western District of Oklahoma during the period 1963 through 1978. Each of the businesses was dissolved and the liquidating value of its assets was distributed among the administrative costs of bankruptcy, payment of taxes due, and payments to creditors. The authors find the mean ratio of administrative costs of bankruptcy to the liquidating value of the business to be 7.5 percent and the median value to be 1.7 percent. Their data demonstrate that the dollar amount of the administrative costs is a concave function of the liquidating value of the firm. Scherr (1983) estimates the direct costs to be between 3.0 and 4.3 percent of assets. Altman (1984) finds that direct bankruptcy costs are 6 percent of market value in the years preceding the bankruptcy and in the year of the bankruptcy as well. The majority of the studies' direct cost percentages are higher than Warner (1977) and are definitely nontrivial.

Altman (1984) defines indirect bankruptcy costs namely as the lost profits that a firm can be expected to suffer due to significant bankruptcy potential. According to his definition lost sales, lost profits, the higher cost of credit, or possibly the inability of the enterprise to obtain credit due to the high possibility of bankruptcy are included in the indirect costs of bankruptcy. The author regresses the bankrupt firm's sales on the appropriate industry sales figure for the 10-year period prior to the forecasted year. That is, for the third year prior to failure, sales of the firm are regressed on industry sales for the period t-13 to t-4. Industry sales are then inserted for the period t-3 and firm sales are estimated. Applying the average profit margin on sales over that 10-year period to the expected sales figure, Altman (1984) arrives at expected profits. Expected profits are then compared with actual profits to determine that year's indirect costs. With a sample of 19 firms the regression results have shown that bankruptcy costs are not trivial. In many cases they exceed 20% of the value of the firm measured just prior to bankruptcy. On average, bankruptcy costs ranged from 11% to 17% of firm value up to three years prior to bankruptcy. Altman (1984) also calculates the expected present value of bankruptcy costs, and compares them with expected present value of the tax benefits from leverage. The

present value of expected bankruptcy costs for many of the bankrupt firms is found to exceed the present value of tax benefits. Therefore, the author concluded firms were overleveraged and that a potentially important ingredient in the discussion of optimum capital structure is the bankruptcy cost. Asquith, Gertner, and Scharfstein (1994), Gilson (1997), and Hotchkiss (1995) examine financially distressed firms and find indirect evidence that financial distress is costly. Both Ofek (1993) and Opler and Titman (1994) study larger samples of firms that experience some financial distress. Ofek (1993) shows that highly-leveraged firms are more likely than their less-leveraged counterparts to respond operationally and reduce the cost of financial distress. However, Opler and Titman (1994) demonstrates that highly leveraged firms lose substantial market share to their more conservatively financed competitors in industry downturns. Especially, firms in the top leverage decile in industries that experience output contractions experience sales decline by 26 percent more than do firms in the bottom leverage decile. A similar decline occurs in the market value of equity. These findings are consistent with the view that the indirect costs of financial distress are significant and positive. Andrade and Kaplan (1998) studies thirty-one highly leveraged transactions (HLTs) that become financially distressed. They estimate financial distress costs to be 10 to 20 percent of firm value. From an ex ante perspective that trades off expected costs of financial distress against the tax benefits of debt, the costs of financial distress seem low for their sample of firms. The authors explain this finding with low *expected cost of financial distress* since only less than one third of firms in their sample undergo financial distress.

Dynamic modelling of trade-off theory dictates the existence of a target debt ratio. In literature, continuous adjustment of capital structure towards the target ratio has been called *mean reversion.* Fama and French (2002) empirically showed that the leverage is mean reverting. The results of Kayhan and Titman (2007) support the view that firms behave as though they have target debt ratios, but their cash flows, investment needs, and stock price realizations lead to significant deviations from these targets. Their results indicate that the capital structures of firms move back towards their targets but at a slow rate. Leary and Roberts (2005) empirically examine whether firms engage in a dynamic rebalancing of their capital structures despite the costs of adjustment. They demonstrate

that the presence of adjustment costs has significant influence on corporate financial policy. However, they find that firms actively rebalance their leverage to stay within an optimal range. Their evidence suggests that the effect of shocks on leverage observed in previous studies is more likely due to adjustment costs than indifference toward capital structure. Though the empirical evidence usually confirms mean reversion, conducting research on mean reversion remains challenging. The fact that the target debt-to-equity ratio is unobservable renders the research questionable. As an example, Chang and Dasgupta (2009) show that even random financing can lead to mean reversion in simulated data. Their findings suggest that a number of existing tests of target behavior have no power to reject alternatives.

2.3.Agency Costs Theory

2.3.1.Theoretical Framework

Some of the empirical studies related to the trade-off theory revealed that marginal tax benefit of debt is greater than the marginal expected bankruptcy cost because the direct bankruptcy costs are trivial and the level of debt is below optimal. Debt conservatism is difficult to explain within trade-off theory by considering only the debt tax shield and bankruptcy costs. Moreover, the same cross-sectional regularities in financial leverage that exist today can also be observed in data prior to the introduction of corporate taxes in United States. Some researchers attempted to explain these observations by incorporating the agency costs into the trade-off theory.

Jensen and Meckling (1976) argue that the probability distribution of cash flows provided by the firm is not independent of its ownership structure and introduce the agency costs to explain the optimal leverage. The authors identify two types of conflict: conflicts between the equity shareholders and managers, and conflicts between the equity shareholders and debt holders. Conflicts between the shareholders and the managers arise

because managers do not capture the entire gain from the profit maximization efforts. Instead, they may be able to utilize the firm resources for their own benefit such as corporate jets, luxurious offices, etc. This conflict can be mitigated by increasing the fraction of the equity held by the manager. Utilizing more debt and less equity will cause an increase in the manager's share of the equity without changing the manager's investment in the firm. Moreover, debt financing reduces the amount of free cash available for a manager to pay out for his/her own interest. Conflicts between the debtholders and equityholders arise because the debt contract promotes equityholders to invest in risky projects. If the investment yields returns well above the face value of the debt, equityholders captures most of the gain. On the other hand, if the investment fails debtholders bear the loss because of the limited liability of the equityholders. When the debtholders anticipate the behavior of equityholders, equityholders receive less for the debt than they otherwise would. Thus, the cost of the incentive to invest in value-decreasing projects created by debt is borne by the equityholders who issue the debt (Harris and Raviv, 1991). This effect, which is called asset substitution effect, is an agency cost of debt financing. Jensen and Meckling suggest that there is an optimum combination of outside debt and equity which minimizes the agency costs of both debt and equity as depicted in Figure 2.1.

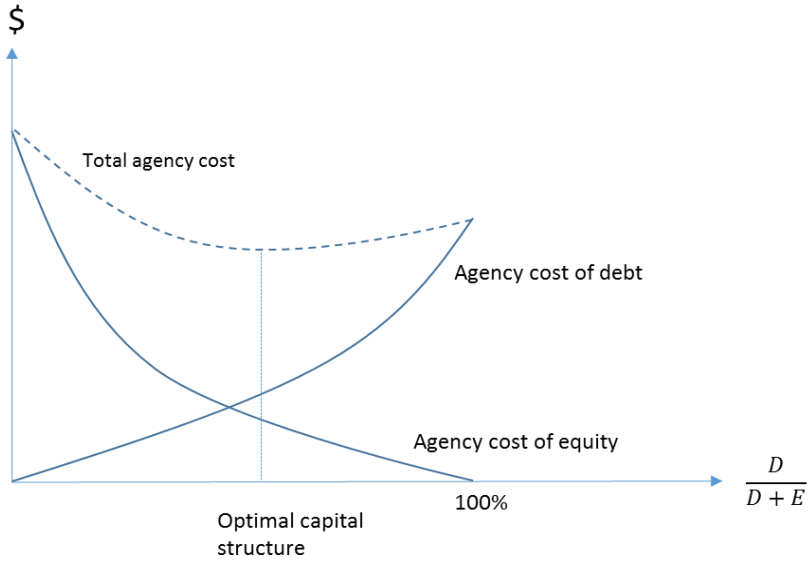

Figure 2.1 Optimal capital structure

Jensen (1986) expresses the role of debt in motivating organizational efficiency. He argues that debt reduces the agency cost of free cash flow by reducing the free cash available for spending at the discretion of managers. Jensen (1986) claims that debt has control function over organizations especially with large cash flows and low growth prospects since the pressure to invest in uneconomic projects in this type of organizations is most serious. The author also underlines the advantage of issuing debt in exchange for stocks over dividend payouts. He argues that by issuing debt in exchange for stock, managers promise to pay out future cash flows in a way that cannot be accomplished by simple dividend increase. By this way, they give shareholder recipients of the debt the right to take the firm into bankruptcy court in case that they cannot keep their promise to make the interest and principal payments. Issuing debt to buy back stock also helps managers overcome the organizational resistance to retrenchment which the payout of free cash flow requires. Jensen (1986) claims that the threat caused by failure to make debt service payments serves as a motivating force to make organizations more efficient. The author also emphasizes that increasing leverage also increases the agency cost of debt, and the bankruptcy costs. Therefore, he concludes the optimal debt-equity ratio is the point where the marginal cost of debt offset the marginal benefits.

Harris and Raviv (1990) develop both static and dynamic models in order to stress the role of debt in allowing investors to generate information useful for monitoring management and implementing efficient operating decisions. In the static model, they consider a once-and-for-all choice of debt level. In the dynamic model, they examine the evolution of capital structure and net payments to debtholders over time. The authors' primary argument is that debt allows investors to discipline management and provides information useful for this purpose. In their model, investors use information about the firm's prospects to decide whether to liquidate the firm or continue current operations. However, the managers are unwilling to provide detailed information to investors that could result in such an outcome since the operation of the firm under any circumstances is in their best interest. As a result, investors use debt to generate information and monitor management. They gather information from the firm's ability to make payments and from a costly investigation in the event of default. The optimal amount of debt is determined by

trading off the value of information and opportunities for disciplining management against the probability of incurring investigation costs. Their model predicts that increases in liquidation value make it more likely that liquidation is the best strategy. Therefore, information is more useful, and a higher debt level is needed to generate that information. They argue that firms with higher liquidation value, e.g., those with tangible assets, will have more debt, will be more likely to default, but will have higher market value than similar firms with lower liquidation value. Using the dynamic model, they also show that debt levels relative to expected income and default probabilities are constant over time. Moreover, they show that expected debt coverage ratios increase and default probabilities decrease uniformly over time with increases in default costs and with decreases in the liquidation value.

Hart and Moore (1995) examine the case where the manager is self-interested and shows that the issuance of senior debt is necessary to discipline the manager. The authors lay out their model, and show that in those cases where simple debt and equity are optimal, (i) the higher is the average profitability of a firm's new investment project, the lower will be the level of long-term debt, (ii) the higher is the average profitability of a firm's existing assets, the higher will be the level of long term debt. This article is important because it not only shows that the agency conflict changes capital structure but also demonstrates that the agency conflict is a necessary condition for the existence of the current capital structures that we observe.

Stulz (1990) is another theoretical study that analyzes financing policies in a firm owned by atomistic shareholders who observe neither cash flows nor management's investment decisions. The author argues that through financing policy the agency costs of managerial discretion can be reduced. These costs exist when management values investment more than shareholders do and has information that shareholders do not have. According to Stulz (1990) managerial discretion has two costs either due to overinvestment or underinvestment. A debt issue that requires management to pay out funds when cash flows accrue reduces the overinvestment cost but exacerbates the underinvestment cost. An equity issue that increases resources under management's control reduces the underinvestment cost but worsens the overinvestment cost. Since debt and equity issues

decrease one cost of managerial discretion and increase the other, there is an optimal solution for the firm's capital structure. Moreover, Stulz (1990) argues that, in general, managers will more likely to implement the optimal debt levels when the threat of takeover is greater. Thus, firms more likely to be takeover targets can be expected to have more debt.

2.3.2.Empirical Evidence

There is limited direct evidence of the propositions of Jensen and Meckling (1976) because of the difficulty of gathering the appropriate data. An exception to this situation is an article by Ang, Cole and Lin (2000). The authors examine how agency costs vary with a firm's ownership structure. Their approach utilizes two assumptions about agency costs: (1) A firm managed by a 100 percent owner incurs zero agency costs and, (2) agency costs can be measured as the difference in the efficiency of an imperfectly aligned firm and the efficiency of a perfectly aligned firm. They use two alternative efficiency ratios in order to measure agency costs of the firm: (1) the expense ratio, which is operating expense scaled by annual sales and, (2) the asset utilization ratio, which is annual sales divided by total assets. Utilizing the data from The Federal Reserve Board's National Survey of Small Business Finances the authors derived the following conclusions in a multivariate regression framework:

1) The agency costs are higher when an outsider manages the firm.
2) Agency costs vary inversely with the manager's ownership share.
3) Agency costs increase with the number of nonmanager shareholders.
4) External monitoring by banks lowers agency costs.

The presence of a founder in the management has a controversial agency theory impact on firm value. Jayaraman et al. (2000) investigate the performance of 94 founder- and nonfounder-managed firms, and find that founder management has no main effect on stock returns over a 3-year holding period. They conclude that for investors, it is important

to neither seek nor avoid investing in a firm simply because it is being led by its founder. Market returns may not be generally predictable using such a simple relationship. Instead, they express the need for investors to try to assess the founder's ability to enhance shareholder value through effective general management practices at different stages of the firm's life cycle.

As regards the conflict between the equityholders and the bondholders, Kim, McConnell and Greenwood (1977) examine the impact of capital structure rearrangement on the values of bond and equity. The authors demonstrate empirically that if there are no prior arrangements to protect bondholders, the stockholders can transfer wealth from bondholders to themselves through a change in the capital structure of the firm. They investigate the effects of one such situation in which firms form captive finance subsidiaries. The firms form wholly-owned finance subsidiaries which then issues debt in its own name, but which is guaranteed by the assets and earnings of the parent company. The proceeds of the debt issue are then used to purchase the parent company's accounts receivable. Thereafter, the creditors of the subsidiary have first claim to the income produced by the sales contracts owned by the finance company. Only after the claims of the subsidiary's creditors are met in full may any funds be transferred from the wholly-owned subsidiary to the parent company to pay its creditors. This rearrangement of the asset and liability structure of the firm essentially creates a new class of security holders with claims that are superior to those of the old bondholders. The authors empirically indicate that after increasing the leverage by establishing a finance subsidiary, stockholders have on average earned excess returns and old bondholders have suffered windfall losses. Their results emphasize the impact of asset substitution occurring due to the conflict between the debtholders and equityholders.

2.4.Pecking Order Theory

2.4.1.Theoretical Framework

Pecking order theory has been developed by considering of asymmetry of information between managers and investors and signaling within the capital structure framework. The pecking order hypothesis is hardly new. Donaldson (1961) examine the financing practices of a sample of large corporations. He observes that managers strongly favor internal generation as a source of new funds even to the exclusion of external funds except for occasional unavoidable need for excessive funds. He demonstrates that managers rarely thought of issuing stock. The large majority of his sample has not had such a sale in the past 20 years and does not anticipate one in the foreseeable future.

Myers and Majluf (1984) analyze a firm with assets-in-place and a growth opportunity requiring additional financing. They assume that investors do not know the true value of either the existing assets or the new opportunity. The authors argue that announcement of an issue of common stock is good news for investors if it reveals a growth opportunity with positive net present value. However, if managers believe the assets-in-place are overvalued by investors and decide to try to issue overvalued shares, it is bad news. If the new shares are overvalued, the issue of new shares causes wealth transfer from new investors to existing shareholders. Myers and Majluf (1984) assume that managers act in the interest of existing shareholders, and refuse to issue undervalued shares unless the transfer from "old" to new stockholders is more than offset by the net present value of the growth opportunity. They argue firms can issue shares only at a marked-down price since investors mostly infer bad news from the issue of new shares about the value of assets in place. They express that the price drop at announcement should be greater where the information asymmetry between the manager and the investors is large. However, issuing debt minimizes the information advantage of the corporate managers. Announcement of a debt issue should have a smaller downward impact on stock price than announcement of an equity issue because debt has the prior claim on assets and earnings,

and investors in debt are therefore less exposed to errors in valuing the firm. This leads to the pecking order theory of capital structure which can be summarized as follows (Myers 2001):

1) Firms prefer internal to external finance. (Information asymmetries are assumed relevant only for external financing.)
2) Dividends are "sticky." Therefore, dividend cuts are not used to finance capital expenditure.
3) If external funds are required for capital investment, firms will issue the safest security first, that is, debt before equity. As the requirement for external financing increases, the firm will work down the pecking order, from safe to riskier debt, perhaps to convertible securities or preferred stock, and finally to equity as a last resort.

Myers (1984) elaborated pecking order in financing capital expenditures by an example. He considers a firm which raises N dollars by a security issue in order to undertake a project with NPV equal to y. The manager knows the shares are really worth N_1. That is, N_1 is what the new shares will be worth when investors acquire the manager's special knowledge. He expresses that the manager will issue equity and invest when

$$y \geq \Delta N \; or \; y \geq N_1 - N \tag{5}$$

If the manager's inside information is unfavorable (i.e. the shares are overvalued), ΔN is negative and the firm will always issue equity. However, if the inside information is favorable (i.e. the shares are undervalued), the firm may pass up a positive-NPV investment opportunity rather than issue undervalued shares if the manager foresees that NPV of the investment is not greater than ΔN. The manager can avoid this problem by reducing ΔN. The way to reduce ΔN is to issue the safest possible securities, i.e. securities whose future value changes least when the manager's inside information is revealed to the market. There are reasonable cases in which the absolute value of ΔN is always less for debt than for equity. If the firm can issue default-risk free debt, ΔN is zero. Even if default risk is introduced, the absolute value of ΔN will be less for debt than for equity. Thus, if the manager has favorable information (ΔN> 0), it is better to issue debt than equity. On

the other hand, if the manager's inside information is unfavorable ($\Delta N < 0$), the manager want to make absolute value of ΔN as large as possible, to take maximum advantage of new investors. If that is the case, stock will seem better than debt. Then the decision rule will be, "Issue debt when investors undervalue the firm, and equity, or some other risky security, when they overvalue it." However, investors will also know that the firm will issue equity only when it is overpriced, and debt otherwise, and will refuse to buy equity unless the firm has already exhausted its debt capacity. Thus investors will force the firm to follow a pecking order.

Myers and Majluf (1984) demonstrate that because firms are unable to communicate their future prospects credibly to investors, firms forego investment opportunities that would otherwise be profitable. Brennan and Kraus (1987) explore the possibility that the investment opportunities may yet be efficiently financed by an appropriate choice of financing instruments that reveals the private information of corporate insiders to investors. They develop a general characterization of a costless signaling equilibrium and give necessary and sufficient conditions for the existence of such an equilibrium. The authors have characterized the conditions under which the adverse selection problem that may prevent a firm from issuing securities to finance an otherwise profitable investment may be costlessly overcome by an appropriate financing strategy. The conditions require a certain compatibility between the nature of the information asymmetry and the set of financing strategies available to the firm, which may depend upon its pre-existing capital structure. Brennan and Kraus (1987) contradicted the pecking order theory by demonstrating that while issuing equity is a negative signal, issuing equity and redeeming debt is a positive signal.

Constantinides and Grundy (1989) cast doubt on the pecking order theory. They investigate how a stock repurchase, coupled with the issue of a senior security, permits management to signal its information to the market and accept a positive net present-value project. The authors show that there is a fully separating equilibrium that can be achieved by an issue of a security that is neither straight debt nor equity. The new security is issued in an amount sufficient to finance the new investment and repurchase some of the firm's

existing equity. The authors interpret these characteristics as being those of convertible debt. The basic idea in their model is that the repurchase of equity makes it costly for firms to overstate their true value while the issuance of a security that is sensitive to firm value makes it costly to understate true value. The design and size of the new issue is adjusted so that, at the true value of the firm, these effects balance at the margin. In their model, the underinvestment problem is costlessly resolved without a reason to finance using internal funds or riskless debt.

Noe (1988) models the debt/equity choice problem first posed by Myers and Majluf (1984) in a signaling game framework. He begins his analysis by defining a simple sequential signaling game model of financing which is comparable with that of Myers and Majluf with the exception of two important differences. First, he does not assume that all firms have access to positive NPV projects. Second, he explicitly model agent's actions and beliefs in a sequential signaling game framework. The author analyzes the debt/equity choice problem by assuming that the firm's terminal cash flows are known with certainty by insiders. Under the perfect foresight assumption, they show that there exist all-equity pooling equilibria contradicting the existence of a pecking order between debt and equity financing. However, when appropriate restrictions on the off-equilibrium beliefs of security buyers are taken into consideration, debt financing dominates equity financing even when some firms do not have access to positive NPV. When the author relaxes the assumption that insiders observe the firm's cash flow perfectly, he shows that the ex-ante probability that a firm will strictly prefer equity financing to debt financing can be made arbitrarily large, and the pecking order between debt and equity breaks down.

The aforementioned studies regard the capital structure as part of the solution to problems of over and underinvestment. However, in literature there are models in which is investment is fixed and capital structure serves as a signal of private insider information. The seminal contribution in this area is that of Ross (1977). The author argues that what is implicit in the Miller-Modigliani irrelevancy proposition is the assumption that the market knows the random return stream of the firm and set the value of the firm regarding this stream. However, he suggests that what is valued in the market is the perceived stream of returns. Therefore, the changes in the capital structure may alter the market's perception

about the firm's performance. Ross (1977) suggests that managers who have favorable inside information about the future signal high quality by taking on high debt and subjecting themselves to discipline. Managers with unfavorable information cannot take on too much debt because it significantly increases the probability of bankruptcy, which has the associated personal costs to the manager. Moreover, unsuccessful firms cannot mimick the successful ones by issuing more debt since they have higher marginal expected bankruptcy costs for any debt level. Thus, firm value, debt level and bankruptcy probability are all positively related in Ross' model.

Another paper related to signaling is by Leland and Pyle (1977). This study focuses on owners instead of managers. The authors assume that entrepreneurs have better information about the expected value of the investment projects than the outsiders. In their model, an entrepreneur chooses the fraction of equity retained and also determines the face value of default-free debt to issue. Since the owner of the firm is willing to invest a greater fraction of his/her wealth in successful projects, the percentage of the equity held by the owner can serve as a signal of project quality. Thus, they demonstrate that the entrepreneur's ownership share increases with firm quality. The more ownership retained, the more debt needs to be issued, leading to the result that as the firm's quality increases, the amount of debt issued increases as well.

2.4.2.Empirical Evidence

Shyam-Sunder and Myers (1999) provide a test that compares the pecking order theory with the static trade-off theory. They define the pecking order hypothesis as the following;

$$\Delta D_{it} = a + b_{PO} DEF_{it} + e_{it} \quad (6)$$

where ΔD_{it} is the amount of debt issued or retired by firm i. DEF_{it} is funds flow deficit which can be calculated at the end of period t for firm i as:

$$DEF_{it} = DIV_{it} + X_{it} + \Delta W_{it} + R_{it} - C_{it} \quad (7)$$

where DIV_{it} is the dividend payments, X_{it} is the capital expenditures, ΔW_{it} is the net increase in the working capital, R_{it} is the current portion of long term debt at start of period, and C_{it} is the operating cash flows after interest and taxes. They test the static trade off theory by the following regression specification:

$$\Delta D_{it} = a + b_{TA}(D_{it}^{*} - D_{it-1}) + e_{it} \quad (8)$$

where D_{it}^{*} is the target debt level for firm i at time t. The hypothesis to be tested is b_{TA}, target-adjustment coefficient is greater than 0. For a sample of 157 mature firms they test two models, and obtain that pecking order model produces more confident results than static trade-off model does. However, they cast doubt whether pecking order model will perform also well for growth firms investing heavily in intangible assets.

Frank and Goyal (2003) study the extent to which the pecking order theory of capital structure provides a satisfactory account of the financing behavior of publicly traded American firms over the 1971 to 1998 period. Their analysis has three elements. First, they provide evidence about the broad patterns of financing activity in order to specify the empirical context for the more formal regression tests. This step of their study serves as a check on the significance of external finance and equity issues. Second, they examine a number of implications of the pecking order in the context of Shyam-Sunder and Myers' (1999) regression tests. Finally, they check to see whether the pecking order theory receives greater support among firms that face particularly severe adverse selection problems. Their sample shows that external financing is heavily used since internal financing is not sufficient to cover investment spending. Debt financing does not dominate equity financing in their sample. When they test trade-off and pecking order in the nested form as specified by Eq. (9), they observe that the financing deficit adds a small amount of extra explanatory power.

$$\Delta D_i = \alpha + \beta_T \Delta T_i + \beta_{MTB} \Delta MTB_i + \beta_{LS} \Delta LS_i + \beta_P \Delta P_i + \beta_{DEF} DEF_i + \varepsilon_i \quad (9)$$

where *T*, *MTB*, *LS*, *P* and *DEF* represents tangibility, market to book value ratio, log of sales, profitability and funds flow deficit respectively. Financing deficit does not challenge the role of the conventional leverage factors. When narrower samples of firms are

considered the greatest support for the pecking order is found among large firms whereas the small firms do not follow pecking order.

Helwege and Liang (1996) test the pecking order model of capital structure by examining the discrete financing decisions between 1984 and 1992 of firms that went public in 1983. The first part of their analysis tests whether an increase in the cash deficit, defined by investment minus cash flow, increases the likelihood of external finance. They estimate this effect with a logit model in which the dependent variable is one if the firm raised funds in the capital markets, and zero otherwise. The second part of their test is the estimation of a multinomial logit model of the determinants of the firms' financing choices, given that external funds were obtained. The second test is based on two predictions of the pecking order theory: (1) Higher risk increases the probability of moving down in the pecking order (from public debt to private debt to equity); and (2) greater asymmetric information problems increase the probability of moving up in the pecking order. Their results indicate that the size of the deficit has no predictive power for the decision to obtain external funds. However, the authors show that firms with surplus funds avoid the capital markets. They demonstrate that the surplus of funds affects only the likelihood of obtaining private debt financing, not the probability of accessing the public capital markets. They interpret their results as evidence against the pecking order theory and consistent with the optimal capital structure model since some firms without a deficit raise external financing to reach a target capital structure. Moreover, among firms that raise funds externally, they do not find evidence of a pecking order. Estimated coefficients on default risk and asymmetric information variables are mostly inconsistent with pecking order theory predictions. They find that riskier firms are no more likely to issue equity. Depending on risk variables, firms that could have obtained bank loans chose to issue equity instead. Although the theory predicts that firms with greater asymmetric information should avoid equity issuance, they show that asymmetric information variables have no power to predict the relative use of public bonds over equity.

Fama and French (2002) analyze the dividend and debt policies of firms in the context of the static trade-off and pecking order models. Controlling for investment opportunities, the trade-off model predicts that more profitable firms have more book

leverage. The pecking order model predicts that more profitable firms have less book and market leverage. The leverage regressions of Fama and French (2002) support the pecking order model. In the trade-off model, firms have leverage targets, and leverage moves inexorably toward its target. In the simple pecking order model, firms do not have leverage targets and leverage is not mean-reverting. The regressions of Fama and French (2002) produce statistically reliable evidence that leverage is mean-reverting. But the rate of mean reversion (7–17% per year) is suspiciously slow. Book and market leverage sorts for dividend payers and nonpayers between years 1965 and 1999 produce a different story. The leverage sorts show that less-levered nonpayers are more profitable, which is consistent with the pecking order model. However, lower leverage for firms with higher spreads of investment over earnings (lower free cash flows) is consistent with the trade-off model. The less-levered nonpayers are typically small growth firms. The least-levered nonpayers make large net new issues of stock (the form of financing most subject to asymmetric information problems), even though they appear to have low-risk debt capacity. This is incompatible with pecking order behavior.

Lemmon and Zender (2010) modify the Shyam-Sunder and Myers (1999) test by accounting for heterogeneity in the level of debt capacity across firms. They modify the Shyam-Sunder and Myers test in two ways. First, they separately examine firms that are expected to be constrained by concerns over debt capacity and those that are not. In this way they exploit the cross-sectional heterogeneity in debt capacity in the sample. They use the contrast in results across these two groups in their empirical design. Second, they include as an additional independent variable the square of the financing deficit:

$$\Delta D_{it} = \alpha + \beta_{PO} DEF_{it} + \gamma DEF^2{}_{it} + \varepsilon_{it} \quad (10)$$

Under the pecking order the relation between the change in debt and the financing deficit when firms face debt capacity constraints is concave. They incorporate the square of the financing deficit to capture the concave nature of the relation and to identify the nature of the financing hierarchy by considering the differences in financing choice between large and small deficits. The results show that when firms must seek external funding, those most likely to be unconstrained by concerns over debt capacity primarily use debt to fill

their financing deficits, while those firms with limited debt capacity exhibit a heavy reliance on external equity financing. The authors explain the preference of small, high-growth firms for equity finance by their growth levels and restrictive debt capacity constraints. When this type of firm seeks equity financing, it experiences a lower price drop at the announcement of the offering despite the greater amount of asymmetric information concerning its value.

2.5.Market Timing

Market timing theory advocates that the capital structure evolves as the cumulative outcome of past attempts to time the equity market (Muradoglu and Sivapradas, 2011). In other words, firms prefer equity when the relative cost of issuing equity is lower than that of issuing debt. Baker and Wurgler (2002) investigate how equity market timing affects capital structure. They examine whether market timing has a short-run or a long-run impact by capital structure regressions in which leverage is the dependent variable and the "external finance weighted-average" market-to-book ratio is the independent variable. This variable is a weighted average of a firm's past market-to-book ratios which takes high values for firms that raised their external finance—equity or debt—when their market-to-book ratios were high. The basic regression result is that leverage is strongly negatively related to this measure of historical market valuations. The influence of past market valuations on capital structure is economically significant and statistically robust. Their analysis demonstrates that the fluctuations in market value have very long-run impacts on capital structure. It is hard to explain this result within traditional theories of capital structure. In the trade-off theory, market-to-book ratio is an indicator of investment opportunities, risk, agency, or some other determinant of the optimal leverage ratio. The trade-off theory predicts that temporary fluctuations in the market-to-book ratio have temporary effects. However, Baker and Wurgler (2002) indicates that the market-to-book ratio has very persistent effects. The observed strong relationship between leverage and the long-past pattern of investment opportunities cannot be explained by the pecking order theory either. The main finding of Baker and Wurgler (2002) is that low leverage firms are

those that raised funds when their market valuations were high, as measured by the market-to-book ratio, while high leverage firms are those that raised funds when their market valuations were low. Pecking order theory implies the opposite, i.e. periods of high investment will push leverage higher toward a debt capacity. Depending on the empirical results they argue that capital structure is the cumulative outcome of attempts to time the equity market.

There are two versions of equity market timing that lead to similar capital structure dynamics. The first one deals with adverse selection costs that vary across firms or across time. Choe, Masulis and Nanda (1993) extend the earlier tests of an adverse selection effect in the equity issuance process by extending the Myers-Majluf model to allow for debt issuance. The authors find that the monthly relative frequency of public offers of common stock relative to bonds measured in market value terms is significantly positively associated with prior stock market returns and various business cycle variables. The effect of interest rate changes is insignificant in explaining the relative frequency of equity offerings. They also indicate that business cycle variables have significant incremental explanatory power in accounting for the magnitudes of the excess announcement period stock returns. These findings are consistent with the adverse selection model's prediction that periods of economic growth are associated with both greater volumes of equity issues as well as lower adverse selection costs. Korajczyk, Lucas, and McDonald (1991) argue that asymmetric information has implications for the timing of new issues and for the relation between the pricing and timing of new issues. They test these implications on a sample of NYSE, AMEX, and Over-the-Counter (OTC) firms that issued equity over the period 1978-1983. Their findings are as follows:

1. Firms tend to issue equity earlier within a quarter rather than later, and are least likely to issue at the end of the fourth quarter.
2. Almost no firms issue equity in the first few weeks after the announcement of the fourth quarter's earnings. This may be due to the lag of several weeks between that earnings release and the release of the annual report.
3. Earnings releases in the year prior to an equity issue convey good news (generate positive stock returns), and are more informative than average. By contrast, three of

the four earnings releases in the year following an issue generate zero abnormal returns.

4. The stock price decline at the announcement of an issue is increasing in the time since the last information release. This result is marginally statistically significant and of a magnitude that seems important in economic terms. Also, the stock price decline at issue is increasing in the time since issue announcement.

Bayless and Chaplinsky (1996) develop a model in order to examine whether there is a window of opportunity for seasoned equity issuance. They define hot, cold and normal equity issue markets by ranking a three-month moving average of equity issue volume into quartiles. High volume issue periods (HOT) are defined as at least three contiguous months where equity volume exceeds the upper quartile. Low volume issue periods (COLD) are at least three contiguous months where issue volume falls below the lower quartile. The periods falling between the upper and lower quartile cutoffs are identified as normal (NORMAL) periods. The regression results present that the price reaction to equity issue announcements in high equity issue volume (HOT) periods is approximately 200 basis points lower on average than in low equity issue volume (COLD) periods. The lower price reaction in hot markets is economically important and is independent of the macroeconomic characteristics of hot and cold markets. The evidence supports the existence of windows of opportunity for equity issues that result at least partially from reduced levels of asymmetric information.

The second version of equity market timing involves irrational investors or managers and time-varying mispricing or perceptions of mispricing. Managers issue equity when they believe its cost is irrationally low and repurchase equity when they believe its cost is irrationally high. Previous research has shown that stocks with low prices relative to book value, cash flow, earnings, or dividends (i.e. value stocks) earn high returns. Value stocks may earn high returns because they are more risky or systematic errors in expectations may explain the high returns earned by value stocks. La Porta (1996) tests for the existence of systematic errors using survey data on forecasts by stock market analysts, and shows that investment strategies that seek to exploit errors in analysts' forecasts earn superior returns. Similarly, La Porta et al. (1997) study stock price reactions around

earnings announcements for value and glamour stocks over a 5-year period after portfolio formation and show that a significant portion of the return difference between value and glamour stocks is attributable to earnings surprises that are systematically more positive for value stocks. The critical assumption in the second version of equity market timing is that managers believe that they can time the market. The evidence in the survey by Graham and Harvey (2001) supports the critical assumption that managers believe they can time the market, but does not distinguish between the mispricing and the dynamic asymmetric information version of market timing.

2.6.Corporate Control

In parallel with the growing importance of takeover activities in the 1980's, the finance literature began to examine the linkage between the market for corporate control and capital structure. Harris and Raviv (1988), Stulz (1988) and Israel (1991) develop models by exploiting the fact that common stock carries voting rights whereas debt does not. The basic idea is that managers select capital structure to manage the ownership structure in a way that provides advantages in future takeover battles.

In Harris and Raviv (1988) model, an incumbent manager owns an initial fraction α_0 of an all-equity financed firm. The remaining equity is held by passive investors who are not contenders for control. The incumbent manager obtains benefits of control as long as he controls the firm. The value of cash flows that he can expropriate from the firm if he is in control is one example of such benefits. In addition to the incumbent and passive investors, there is also a rival for control of the firm. If the rival takes over, he also obtains benefits of control. The manager chooses his/her share α such that the expected payoff is maximized. The payoff consists of the value of the manager's stake plus the value of his/her control benefits. As α is increased, the probability that the manager retains control and its benefits increases. However, if α is increased more than necessary, the likelihood of bankruptcy increases. Consequently, the value of the firm and the manager's stake are reduced. Harris and Raviv (1988) assume that the manager can increase α by issuing debt

in order to repurchase equity from the passive investors. By this way, the manager adjusts the capital structure so that his/her payoff is maximized.

Stulz (1988) also assumes an incumbent manager, passive investors and a potential rival. In his model the rival should obtain more than 50% of the equity to gain control, and he can purchase only the shares of the passive investors. The rival is supposed to pay total premium P to the passive investors in order to succeed in takeover. B is the benefit that the rival acquires in case he gains control. The model assumes that the rival will bid P if his benefit B exceeds P. The probability that the passive investors obtain the premium is defined as follows:

$$\Pr(B \geq P(\alpha)) \equiv \pi[P(\alpha)] \tag{11}$$

Since the premium to be paid to the passive investors increases with α, and π is a decreasing function, the probability of a takeover declines with α. The expected gain to the passive investors is:

$$Y(\alpha) = P(\alpha)\,\pi[P(\alpha)] \tag{12}$$

The incumbent's share α is chosen to maximize Y. There is an optimum level of α, because increases in α increase the takeover premium given success but decrease the probability of success.

Israel (1991) observes that target and acquiring shareholders bargain only over that portion of the gains that is not previously committed to debtholders. The more debt issued, the less gain is left for target and acquiring shareholders to share. In addition, target shareholders can capture the gains accruing to target debtholders when the debt is issued. Therefore, debt reduces the gain captured by acquiring shareholders, and the payoff to target shareholders is increased by increased debt levels in case that the takeover is realized. The optimal debt level is determined by balancing this effect against the reduced probability of takeover because of the reduced share of the gain captured by acquiring stockholders.

2.7.Product Market Strategy

There are studies that examine the connection between capital structure and either product market strategy or characteristics of product inputs (Harris and Raviv 1991). In one such study, Brander and Lewis (1986) argue that product markets and financial markets have important linkages. One way through which the financial structure can affect the output markets is referred to as the limited liability effect of debt financing by the authors. As firms take on more debt, they will have an incentive to pursue output strategies that raise returns in good states and lower returns in bad states. Since bondholders are the residual claimants, the shareholders will ignore reductions in returns in bankrupt states. Therefore, the shareholders will favor different output strategies as far as the level of debt changes over different states. Brander and Lewis (1986) call the second linkage between the output markets and financial markets as strategic bankruptcy effect. The firms make output market decisions that raise the chances of driving their rivals into financial distress. Because the possibility of financial distress is contingent on the capital structure of the firm, this provides another channel for finances to affect output markets. By utilizing essential aspects of modern financial and oligopoly theory, their analysis illustrates that output market behavior will, in general, be affected by financial structure, and foresighted firms will anticipate output market consequences of financial decisions.

Maksimovic (1988) analyzes how capital structure endogenously determines the type of equilibrium ("collusive" or Cournot) in the product market, whereas Brander and Lewis (1986) examined the effect of capital structure on firm values, while taking the type of equilibrium as given. He analyzes the effect of a firm's capital structure on its product market strategy in the context of a model of repeated oligopoly. He shows that there exists an upper bound on the firm's debt level in the absence of bankruptcy costs. By modeling profits explicitly in terms of demand and cost functions and number of firms, Maksimovic is able to derive comparative static results on debt capacity as a function of industry and firm characteristics. He demonstrates that debt capacity increases with the elasticity of demand and decreases with the discount rate.

Titman (1984) examines an agency relationship between a firm (as the agent) and its customers (as principals) who suffer costs if the firm liquidates. He observes that liquidation of a firm may impose costs on its customers (or suppliers) such as inability to obtain the product, parts, and/or service. These costs are transferred to the stockholders in the form of lower prices for the firm's product. Consequently, the stockholders would like to commit to liquidate only in those states in which the net gains to liquidation exceed the costs imposed on customers. Titman (1984) shows that capital structure can be used to commit the shareholders to an optimal liquidation policy. That is, capital structure is arranged so that stockholders never wish to liquidate, bondholders always wish to liquidate when the firm is in bankruptcy, and the firm will default only when the net gain to liquidation exceeds the cost to customers. According to Titman's model, firms (such as computer and automobile companies) which can potentially impose high costs on their customers and business associates in the event that they liquidate choose capital structures with relatively low debt/equity ratios. Conversely, firms (such as hotels and retail establishments) which impose relatively low costs on their customers and business associates in the event that they liquidate choose high debt/equity ratios.

Campello (2003) empirically examines the argument that capital structure influences a firm's (as well as its rivals') incentives to compete in the product market, thereby influencing competitive outcomes. He provides firm- and industry-level effects of capital structure on product market outcomes for a large cross-section of industries over a number of years. First, by using industry-level data he finds that markups are more countercyclical in industries in which firms use more external financing. His estimates show that the markup of a hypothetical ''all-debt'' industry increases by approximately 42% more than that of a ''zero-debt'' industry in response to a 1% decline in gross domestic product (GDP). He then uses a panel data set containing quarterly information from firms in 71 industries covering over two decades to study the impact of debt financing on sales performance at the firm level. His empirical strategy focuses on the differences in responses of firm sales–leverage sensitivity to macroeconomic shocks across low–debt and high–debt industries. The results show that reliance on debt financing can significantly depress a firm's (relative-to-industry) sales growth in industries in which

rivals are less leveraged as economic conditions worsen. Comparing the performance of two firms in a low-debt industry, one firm with a debt-to-asset ratio 10% above the industry average and the other with a debt-to-asset ratio 10% below that average, the author finds that the industry-adjusted quarterly sales growth of the more indebted firm is 1.3% lower than that of its unlevered rival following a 1% decline in GDP. On the contrary, no such effects are observed in industries in which rivals are relatively more indebted just prior to a similar aggregate shock.

CHAPTER 3

DETERMINANTS OF CAPITAL STRUCTURE

Capital structure theories summarized in Chapter 2 led to the studies that attempted to identify the factors affecting the capital structure decisions. In these studies, observable determinants of leverage capable of explaining the cross-sectional and time-series variation in firms' leverage ratios have been investigated. These factors have been assumed to proxy for the underlying forces of the capital structure theories such as the bankruptcy costs and asymmetry of information. In this chapter, the factors mostly investigated in empirical capital structure research are discussed.

3.1.Tax considerations

The trade-off theory predicts that firms tend to issue more debt when the corporate tax rate gets higher. Since the interest payments are tax deductible in classical tax systems, firms can reduce their tax payments with additional debt. However, because there is correlation between taxes and the profitability, it is difficult to empirically prove this inference. Moreover, information about the firm's marginal tax rates and investors' personal tax rates are usually not easy to gather. Therefore, in addition to the top statutory tax rate, nondebt tax shields such as net operating loss carry-forwards, depreciation expense, and investment tax credits are usually used to measure the impact of taxes on

leverage, because of the argument that firms with nondebt tax shields have less need to exploit the debt tax shield.

Taub (1975) obtains the tax rate from the accounting data of the companies. His results contradict the Miller-Modigliani approach related to the tax deductibility of debt. The tax variable in his model has consistently negative coefficient implying that increases in the tax rate have negative impact on the desired debt-equity ratio.

Davis (1987) argues that the relevant corporate tax rate is the effective rate. Because the statutory rate does not change frequently, and non-debt tax shelters may decrease the firm's taxable income to zero, the author calculates the effective tax rate by dividing actual taxes paid by before-tax cash flow. For the 250 Canadian companies, he estimates the actual taxes paid by deducting any deferred taxes from the reported tax bill. Both the cross-sectional and time-series test demonstrate weak support for the hypothesis that the higher a firm’s effective tax rate, the more debt it will have in its capital structure.

Titman and Wessels (1988) introduce a factor-analytic technique for estimating the impact of unobservable attributes one of which is non-debt tax shields on the choice of corporate debt ratios. Regarding the argument of DeAngelo and Masulis (1980) that firms with large non-debt tax shields utilize less debt in their capital structure, Titman and Wessels (1988) include the ratios of investment tax credits over total assets, and depreciation over total assets in the analysis as substitutes for the tax benefits of debt financing. Their results do not provide support for an effect on debt ratios arising from non-debt tax shields.

Bradley, Jarrell and Kim (1984) identify the variability of firm value, the level of non-debt tax shields, and the magnitude of the costs of financial distress as the factors that influence the optimal capital structure. They measure the non-debt tax shield by the sum of annual depreciation charges and investment tax credits divided by the sum of annual earnings before depreciation, interest, and taxes. Although their model predicts that non-debt tax shields, being substitutes for the tax benefits from debt financing, should be related inversely to firm leverage, the regression results indicate significant positive relation between leverage and the level of non-tax shields. They explain this result with the hypothesis that firms can borrow at lower interest rates if their debt is secured with

tangible assets. In other words, firms that invest heavily in tangible assets, and thus generate relatively high levels of depreciation and tax credits, tend to have higher financial leverage.

Bennett and Donnelly (1993) attempt to explain the cross-sectional variation in the capital structures of non-financial UK companies. They use the potential deferred tax liability divided by total assets as an empirical proxy for the non-debt tax shields. They obtain significant and negative coefficients in the regressions.

Ozkan (2001) uses the ratio of annual depreciation expense to total assets as a proxy for non-debt tax shields in order to analyze the borrowing decisions of UK firms. The results suggest negative and significant relationship with the leverage. Allen and Mizuno (1989) use a measure of nondebt tax shields which is calculated by multiplying earnings before interest and tax by the effective corporate tax rate, deducting income tax payable plus the tax shield on current interest payments and then scaling by earnings before interest and tax. The analysis of 125 Japanese companies suggests negative but insignificant coefficient for the non-debt tax shields. DeMiguel and Pindado (2001) calculate non-debt tax shields variable as the earnings before taxes minus the ratio between the taxes paid and the tax rate. The empirical evidence obtained from the estimation of the target adjustment model suggests an inverse and significant relationship between non-debt tax shields and debt for Spanish firms. Using dynamic panel data methodology, Sayılgan, Karabacak and Küçükkocaoğlu (2006) analyze the impact of firm specific characteristics on the corporate capital structure decisions of Turkish manufacturing firms. The authors use the ratio of annual depreciation expense to total assets as a proxy of non-debt tax shields. Their results demonstrate inverse and significant relationship between the non-debt tax shields and debt.

3.2.Firm Level Determinants

In this section, the firm level determinants mostly investigated in the literature are explained briefly. These factors are namely tangibility, firm size, growth opportunities,

profitability, and volatility. Table 3.1 summarizes the predictions of trade-off and pecking order theories about the sign of the relationship between the factor and leverage ratio.

Table 3.1[1]The predictions of theories about firm-level determinants

Factor	Trade-Off Theory	Pecking Order Theory
Tangibility	+	-
Firm size	+	-
Growth opportunities	-	+/-
Profitability	+	-
Volatility	-	-

3.2.1.Tangibility

Tangibility is related to the value of fixed assets a firm owns. The higher the ratio of fixed-to-total assets is, the higher the level of collateral a firm can offer to its debtors. Having secured loans, it is argued that the lender is less concerned with the asymmetry of information, agency and bankruptcy costs. Therefore, the increasing tangibility will reduce the lender's required return of debt, and increase the attractiveness of debt compared to equity.

Titman and Wessels (1988) incorporate two indicators for the collateral value attribute. They include the ratio of intangible assets to total assets (INT/TA), and the ratio of inventory plus gross plant and equipment to total assets (IGP/TA). The first indicator is negatively related to the collateral value attribute, while the second is positively related to collateral value. The results of factor analysis indicate that both ratios do not appear to be related to the various measures of leverage.

Bennett and Donnelly (1993) expect that agency costs of secured debt are lower than those of unsecured debt. Therefore, they argue that firms with securable assets should issue more debt. Their proxy for the securable assets is plant and machinery divided by total assets which is measured over the period 1981-1984 for nonfinancial UK companies.

[1] Bessler, Drobetz and Kazemieh (2011)

The coefficient for the proxy variable is significant and positive when the total leverage ratio is used as dependent variable. However, when only the long term debt is considered, the results are not significant.

Panno (2003) develops logit model in order to provide a way of quantifying the relationship between the characteristics of the company and the probability of issuing equity at time t given that it will make an issue of either equity or bonds. He uses the ratio of fixed to total assets in the model as a proxy for asset composition and conducts the analysis for companies in UK and Italy separately. For UK sample the coefficient for the asset composition was never significant. For Italian sample, Italian managers appear to be more concerned about asset composition than their English counterparts since the coefficient of this variable was always negative, though never significant.

Frank and Goyal (2009) extract a long list of factors claimed to have some influence on corporate leverage in the existing literature. This list includes measures of profitability, size, growth, industry, nature of assets, taxation, risk, supply-side constraints, stock market conditions, debt market conditions, and macroeconomic conditions. Then they define the core factors by considering how often a factor is included in the minimum Bayesian information criterion specification in repeated runs of the sample which consists of publicly traded US firms from 1950 to 2003. With a market-based definition of leverage, they find that a set of six factors account for more than 27% of the variation in leverage, while the remaining factors only add a further 2%. This set of six factors which are called core factors by the authors have consistent signs and statistical significance across many alternative treatments of the data. The remaining factors are not nearly as consistent. The core factors that are obtained from this process include tangibility which is the ratio of net property, plant, and equipment to total assets. The results demonstrate that firms that have more tangible assets tend to have higher leverage.

Charalambakis and Psychoyios (2012) investigate the impact of the four firm-specific factors, i.e. size, tangibility, profitability and growth opportunities, on debt ratios for the US and the UK firms. They use an extensive dataset that which spans the period 1950-2002 for the US firms, and 1980-2002 for UK firms. They employ a double-censored Tobit estimator, a FE estimator, a regression model that addresses cross-sectional and time-

series dependence and Fama–Macbeth regression model. They demonstrate that tangibility, which is measured by the proportion of the fixed assets in the total assets, is positively related to leverage for US firms as well as for the UK firms.

Gaud, Jani, Hoesli and Bender (2005) examine the determinants of the capital structure for Swiss companies. They perform analyses using data pertaining to 104 firms for the period 1991–2000 in a dynamic panel framework. They apply a combination of the Generalized Method of Moments approach and instrumental variables to check for endogeneity in variables. They use the ratio of the sum of tangible assets and inventories to total asset as a proxy for collaterals. Adding inventories to the tangible assets is motivated by the fact that debts are used partly to finance inventories, and in most cases inventories maintain some value when the firm is liquidated (Kremp et al., 1999). The coefficient of the tangibility variable is positive and significant when market based leverage is used.

3.2.2.Size

The effect of the size on leverage is not clear. The large firms tend to be more diversified, and fail less often. Therefore, the trade-off theory predicts an inverse relationship between size and the probability of bankruptcy, and hence a positive relationship between size and leverage. On the other hand, large firms which are more closely observed by analysts are subjected to less asymmetry of information between the insiders and capital markets. Hence, pecking order theory predicts that large firms are more capable of issuing equity, and reduce the debt ratio in their capital structure.

Titman and Wessels (1988) use the natural logarithm of sales as indicator of size. The results indicate that small firms tend to use significantly more short-term financing than large firms. This difference probably reflects the high transaction costs that small firms face when they issue long-term debt or equity. When long term debt ratio is considered, the results also suggest that size is related to the book value of equity, but not related to market value of equity. The authors argue that this finding may be due to the positive relation between size attribute and the total market value of the firm. 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. Thus, rather than indicating a size effect, they think that this evidence suggests that many firms are guided by the market value of their equity when selecting their long-term debt levels.

Bennett and Donnelly (1993) use natural log of sales revenue as a proxy for the size of the firm. For the total and long term leverage, the coefficient of size is positive and significant. Therefore, they argue that smaller firms utilize less long term debt. However, when the short term leverage is considered, the coefficient of size is not significant.

Ozkan (2001) also uses the natural logarithm of sales as a proxy for the size of firms. He utilizes a partial adjustment model where the firm's financial behavior is characterized as partial adjustment to a long-term target debt ratio. He analyzes both the potential determinants of target debt ratios and the nature of adjustment to these targets. Generalized Method of Moments (GMM) estimation procedure is used to estimate the dynamic model from a short and unbalanced panel. The estimated coefficient for size is not significant. However, its negative sign renders it a potential proxy for the degree of asymmetry of information between the firm and investors. That is, as size of the firm gets larger, its preference for equity relative to debt financing increases.

Panno (2003) suggests that the size of the firm should be positively related to the leverage ratio. He argues that larger firms are more diversified, have easier access to the capital markets, and borrow at more favorable interest rates. In order to test his argument, he uses the natural logarithm of total assets as a proxy for size attribute. In both UK and Italy samples he presents evidence favoring a positive effect of size on the leverage ratios. Although the size coefficient is not significant for the UK case, the Italian sample indicates a significant positive relationship between size and the tendency to resort to debt financing.

Koksal and Orman (2014) conduct a comparative test of the trade-off and pecking order theories using a comprehensive firm-level dataset that covers manufacturing, nonmanufacturing, small, large, publicly-traded, and private firms in a major developing economy, Turkey. They use natural logarithm of total sales rather than total assets to alleviate the problem of multicollinearity since many of their variables are scaled by total assets, including those for debt ratios. They construct and estimate a fixed effects panel

data model. Their results demonstrate that size is positively associated with all three debt ratios, suggesting that ceteris paribus large firms have more debt in their capital structures.

In the core factors determined by Frank and Goyal (2009), size measured by log of assets exists. The authors predict that larger firms (as measured by book assets) tend to have high leverage.

3.2.3.Growth Opportunities

In the literature supporting trade-off theory it is suggested that managers of levered firms have an incentive to engage in asset substitution and underinvestment. Since the debt-related agency costs are higher for firms with substantial growth opportunities, the trade-off theory predicts that firms with more investment opportunities have less leverage. The predictions of the pecking order are contradictory. Debt typically grows when investment exceeds retained earnings and falls when investment is less than retained earnings. Therefore, book leverage is predicted to be higher for firms with more investment opportunities. However, according to the pecking order theory, managers are concerned with future as well as current financing costs. Firms with large expected growth opportunities are supposed to maintain a low-risk debt capacity in order to avoid financing future investments with new equity offerings. Therefore, in another aspect the pecking order theory argues that firms with larger expected investments exhibit less current leverage.

Titman and Wessels (1988) include capital expenditures over total assets (CE/TA) and the growth of total assets measured by the percentage change in total assets (GTA) as indicators of growth. They obtain positive and significant coefficient estimate of the growth attribute in the long-term debt over book value of the equity equation. They argue that, since growth opportunities add value to a firm, they increase the firm's debt capacity and, hence, the ratio of debt to book value, since this additional value is not reflected in the firm's book value.

Bennett and Donnelly (1993) proxy the expected growth by the subsequent average annual percentage change in the total assets of the firm during 1985-1988. For short-term, long term, and total leverage, the proxy for growth opportunity does not have significant coefficient.

Ozkan (2001) uses the ratio of the market value of assets to the book value of assets as a proxy for growth opportunities. This proxy is defined as the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of total assets. The coefficient of market-to-book ratio is negative and significant. The author argues that the result is consistent with the view that firms with greater growth opportunities might have lower leverage ratios due to the fear of debtholders that firms might pass up valuable investment opportunities. Moreover, according the author the negative coefficient of the market-to-book ratio may stem from the tendency of firms to issue stock when their stock price is high relative to their earnings or book value.

Sayılgan, Karabacak and Küçükkocaoğlu (2006) define growth opportunities in two forms: the annual growth rate in plant, property and equipment [GROWppe] and the annual growth rate in total assets [GROWta] and measure these variables as percentage change in plant, property and equipment and percentage change in total assets respectively. The coefficient for the growth opportunities in total assets [GROWta] has positive sign, whereas the annual growth rate in plant, property and equipment [GROWppe] has a coefficient with negative sign. The coefficients of both GROWta and GROWppe are statistically significant.

Charalambakis and Psychoyios (2012) use the ratio of market value of assets to book value of assets as a proxy for growth opportunities. For both UK and US firms, the results demonstrate that growth opportunities are negatively associated with book leverage and the market value leverage as well.

Huang and Song (2006) employ a new database containing the market and accounting data (from 1994 to 2003) from more than 1200 Chinese-listed companies to document their capital structure characteristics. Tobin's Q (market-to-book ratio of total assets) is employed to measure growth opportunities in this study. Their results show significant and inverse relationship between the growth opportunities and leverage. They

argue that Chinese firms with brighter growth opportunities in the future prefer to keep leverage low so they will not give up profitable investment because of the wealth transfer from shareholders to creditors. Moreover, growth opportunities are intangible assets, which are more likely to be damaged in financial distress. Therefore, Chinese firms with more intangible assets are less eager to use debt in their capital structure.

Frank and Goyal (2009) determine the growth opportunities measured by market-to-book ratio as a core factor for the market leverage. Their results demonstrate that firms with a high market-to-book ratio tend to have low levels of leverage.

3.2.4.Profitability

According to the trade-off theory, firms prefer more leverage in their capital structure as long as their profitability increases. First of all, expected bankruptcy costs decline when profitability increases which helps increase leverage. Second, the deductibility of interest payments for tax purposes induces more profitable firms to finance with debt. Third, higher leverage helps to control agency problems in firms with high profit by forcing managers to pay out more of the firm's excess cash.

On the contrary, the pecking order model predicts that higher profits should result in less leverage. Firms prefer raising capital initially from retained earnings, then from debt, and finally from issuing new equity due to the adverse selection costs associated with new equity issues in the presence of information asymmetries. Therefore, increasing profitability will decrease the need for external financing.

Titman and Wessels (1988) use the ratios of operating income over sales (OI/S) and operating income over total assets (OI/TA) as indicators of profitability. Coefficient estimates for the profitability attribute are negative, large in absolute terms and have high t-statistics in the equations with debt over market value of equity as dependent variable, but they are not statistically significant in the equations with the debt measures scaled by book value of equity. This suggests that increases in the market value of equity, due to an increase in operating income, are not completely offset by an increase in the firm's borrowing. This result is consistent with the pecking order theory.

Allen and Mizuno (1989) constructs a profitability measure by dividing earnings before interest and taxes by total assets. The regression results show inverse and significant relationship between the leverage and profitability.

Bennett and Donnelly (1993) measure profitability with operating income scaled by total assets. This proxy they use is significant with negative sign when market based measures of leverage are used. However, the coefficient is positive but insignificant when book values are used in calculating leverage. When the regressions of total, long term, and short term leverage are considered all together, the conflict is resolved by the authors. When long term debt is used, all the coefficients are negative albeit only those in regressions where leverage is measured in market value terms are significant. For short term debt, coefficients are positive but not significant. The authors infer from these results that profitable firms will tend to reduce their long term debt to the extent that they have to borrow. When they need to borrow, such firms will tend to use short term debt.

Ozkan (2001) measures the profitability as the ratio of the earnings before interest, tax and depreciation (EBITD) to total assets. The estimated coefficient is significant at the 1% level. The negative sign of profitability is consistent with the pecking order theory that predicts a preference for internal finance over external finance. He comments that current profitability of firms exerts a negative influence on firms' borrowing decisions. He views that the relation between past profitability and leverage should also be negative as past profitability can be viewed as proxy for future growth opportunities whose value could be severely damaged in financial distress. However, the coefficient on the lagged profit is positive and significant, which is inconsistent with his view.

In the model developed by Panno (2003) which analyzes the choice between equity and debt in those cases in which firms resort to the long-term capital market, the measure of profitability is ‘‘Pre-tax Profit Margin’’, the ratio of pre-tax profit to total sales, named PRTPFMG in the regression. The results demonstrate that the profitability of firms exerts a positive influence on firms borrowing decisions. In the UK sample, the coefficient of PRTPFMG is always negative and rather significant, its t-statistic being 2.57 in the best case. Also for the Italian sample a negative coefficient for PRTPFMG is observed. The author argues that the positive effect of profitability on firms' leverage might be due to the

tax advantage of debt. That is, profitable firms may reveal a high demand for interest tax shield. Moreover, more profitable firms may be seen by debtholders as less risky (i.e. probability of bankruptcy is low). As a result, these firms can get more debt relatively easily.

Chen and Strange (2005) investigate the determinants of the capital structure of a sample of 972 listed companies on the Shanghai Stock Exchange and Shenzhen Stock Exchange in China in 2003. They use the ratio of earnings before interest and tax to total assets as a proxy for profitability. The regression of both market and book value measure of leverage on several independent variables produces highly significant and negative coefficients for profitability measure. The negative signs indicate that firms with more profitable projects are inclined to use internally generated funds rather than debt. The results indicate that every 1% increase in the return on assets will lead on average to a 0.86% reduction in the book debt ratio, and to an average 0.29% fall in the market value measure, other things being equal.

Sayılgan, Karabacak and Küçükkocaoğlu (2006) use the ratio of earnings before interest, tax and depreciation to total assets as a proxy for profitability. Fixed-effects panel estimation results indicate that the book value measure of leverage and profitability have negative and significant relationship for Turkish manufacturing firms. They argue that this result supports the pecking order theory that high profit firms use internal financing (successful companies do not need to depend so much on external funding), while low profit firms use more debt because their internal funds are not adequate.

Frank and Goyal (2009) prove that profitability is one of the most reliable factors for explaining market leverage. They measure profitability with the ratio of operating income before depreciation to assets. The factor analysis produces negative coefficient for profitability. The authors explain the sign on profits by dynamic trade-off models in which firms allow their leverage to drift most of the time and only adjust their leverage if it gets too far out of line. Moreover, they comment that firms stockpile retained earnings until the time is right to buy physical capacity.

3.2.5.Volatility

Firms with volatile cash flows, which is mostly proxied by the standard deviation of stock returns, experience higher expected costs of financial distress, and the debt-related agency costs are also more pronounced with increasing volatility (Bessler, Drobetz and Kazemieh, 2011). Since the tax shield will not be completely exploited when the volatility of cash flows gets higher, the trade-off theory implies a negative relationship between leverage and the volatility of cash flows.

As regards the volatility, the prediction of the pecking order theory is similar. The investors have difficulty to accurately forecast future earnings based on publicly available information for firms with high earnings volatility. Therefore, the market will view these firms as “lemons” and demand a premium to provide debt. Additionally, in order to reduce the probability of being unable to realize profitable investments unless new equity is issued when cash flows are low, firms with more volatile cash flows maintain low leverage. Therefore, the pecking order model also predicts a negative relationship between leverage and cash flow volatility.

Bradley, Jarrell and Kim (1984) measure volatility with the standard deviation of the first difference in annual earnings, scaled by the average value of the firm's total assets over the period. The results indicate that their measure of firm volatility is significant and negatively related to firm leverage ratios across the 821 firms in the sample.

Titman and Wessels (1988) use the standard deviation of the percentage change in operating income as a proxy for volatility. Though the results indicate an inverse relationship between volatility and leverage, the estimates of structural coefficients are not significant to make a judgment about the relationship.

Bennett and Donnelly (1993) proxy volatility using the standard deviation of the first difference in earnings before interest and depreciation scaled by the average value of the firm’s total assets over the period from 1977-1988. Though their expectation is a negative relationship between the volatility and leverage, the results of the regression are counterintuitive. Specifically, the regressions with the dependent variable as total leverage generate significant and positive coefficients for proxy variable for volatility. In order to

explain this result, they argue that firms that already have risky assets do not have the opportunity to increase their risk and thus cannot transfer wealth from the bondholders to the shareholders. Therefore, they can use more leverage than less risky firms, *ceteris paribus*. However, if bankruptcy costs are more significant than agency costs, negative relationship is expected.

Chen and Strange (2005) use the standard deviation of the return on equity over three years (2001–2003) as a proxy for volatility, and expect this variable to have a negative impact upon the debt ratio. The results demonstrate that the volatility variable has positive and significant coefficient, which does not conform to their expectation. They express that this might reflect the unique institutional structure (including taxation rules and bankruptcy law) of China where their sample of firms operate. Bankruptcy is rare in China, particularly in listed firms, as the Government provides support when necessary. In the sample of 972 firms in their study, some of the firms' assets fall short of their liabilities in some instances, but these firms continue to exist as the banks are not allowed to force the firms to go bankrupt.

Koksal and Orman (2014) measure the volatility with the standard deviation of operating income over total assets over the past 3 years. The estimated coefficient of volatility variable is significantly negative in the long-term and total leverage equations. This result indicates that increases in a firm's riskiness reduce the level of long-term debt in its capital structure but does not have a significant effect on the level of short-term debt relative to total assets. The authors view this result as an evidence of the argument that firms which are viewed as risky by creditors find it more difficult to borrow long-term.

3.3.Industry Effect

Industry effects are important factors for capital structure decisions. It is well known that leverage ratios exhibit significant variation across industries. Bowen, Daley and Huber (1982) demonstrate that there is a statistically significant difference between mean industry financial structures. They also show that firms exhibit a statistically significant tendency to move toward their industry mean. Bradley, Jarrell and Kim (1984)

analyze the variance of firm leverage ratios by industrial classification. Their results indicate that there is more variation in mean leverage ratios across industries than there is in firm leverage ratios within industries. Their results show that drugs, instruments, electronics, and food have consistently low leverage while paper, textile mill products, steel and airlines have consistently high leverage.

Industry differences in leverage ratios have several explanations. One interpretation is that managers perhaps use industry median leverage as a benchmark as they contemplate their own firm's leverage. Thus, industry median leverage is often used as a proxy for target capital structure. Another interpretation is that industry effects reflect a set of correlated, but omitted factors. Firms in an industry face common forces that affect their financing decisions. Product market interactions or the nature of competition specific to the industry as well as the industry heterogeneity in the types of assets, business risk, technology, or regulation may have similar influence on the firms operating in the same industry. Frank and Goyal (2009) use industry median leverage in their factor analysis. Their results indicate that firms in industries in which the median firm has high leverage tend to have high leverage.

Regulation in an industry is another factor that impacts capital structure decisions. Bradley, Jarrell and Kim (1984) show that firms operating in regulated industries such as telephone, electric and gas utilities and airlines are among the most highly levered ones. However, the theories' explanation for the effect of the regulation is not that simple. The trade-off theory predicts the relationship ambiguously. Regulated firms have stable cash flows and lower expected costs of financial distress. Thus, regulated firms should have more debt. But, at the same time, managers have less discretion in regulated firms, which reduces the severity of shareholder-manager conflicts and makes debt less desirable from a control perspective. From a pecking order perspective, industry classification should only impact capital structure choices if it serves as a proxy for a firm's financing deficit, and hence no direct linkage can be inferred. As to the market timing theory, the industry should matter only if valuations are correlated across firms in an industry. In empirical studies financial institutions and utilities are usually excluded from the sample since these

industries are subject to specific rules and regulations, and therefore exogenous factors unrelated to direct financing activities may affect their leverage decisions.

The capital structure difference between industries is usually modeled by an industry dummy variable in empirical studies. Kester (1986) is one of those studies which examines the Japanese corporate capital and ownership structures and compares them to those of U.S. corporations. U.S. companies are classified into industries on the basis of their Standard and Poor's (S&P) industry codes, which are derived from SIC classifications. The classification of the Japanese firms conforms to that used by Daiwa Securities in the Analyst's Guide. Generally, there is a close match between the two systems of industry classifications. Only few of the S&P codes are to be combined to match properly the Daiwa and S&P industry definitions. Dummy variables for 26 of the 27 industries are included in the regression to test for industry effects in the determination of capital structure. Four or five of the estimated coefficients for the industry dummy variables are positive and significant at a 5% significance level, the number depending upon which specification of the book value debt ratio is used. When market value debt ratios are used, almost twice as many industry dummy coefficients are positive and significant. Most of the significant coefficients belong to the mature, heavy industries and include steel, general chemicals, nonferrous metals, paper, and petroleum refining.

Talberg, Winge, Frydenberg and Westgaard (2008) examine the capital structure across different industries for companies quoted on a stock exchange and headquartered in the United States. They make use of the industry definitions from The Industry Classification Benchmark (ICB), and select the firms belonging to 5 sectors, namely construction, food and beverage, oil and gas, chemicals and software. They run a regression model separately for each industry to detect which factors affect the capital structure within each business in the industry. Moreover, a pooled regression model has been constructed and tested by including four industry dummy variables and pooling all the firms. In the regressions for each industry separately, the most notable differences they observe are high profitability coefficient for Construction; the positive and quite high asset structure variable coefficient of Oil & Gas; and the overall low debt for Software. Moreover, some of the independent variables such as growth and size perform quite

similarly for all industries, suggesting that some factors have virtually the same impacts. In the pooled regression, the coefficients for industry dummies are quite significant. However, the authors express that the interpretation of the dummies is difficult since what variables the dummies proxy for is hard to detect.

3.4.Economic and Institutional Factors

The traditional theories of capital structure focus on the firm-specific factors that affect the capital structure decisions. However, differences in the development of capital markets, legal systems, bankruptcy laws, macroeconomic conditions and changes in the regulatory environment may dramatically affect the decisions of firms related to investment and finance. The empirical work focusing on those aforementioned factors usually involve cross-country comparison and are scrutinized in Chapter 4. In this chapter, only brief information about these factors is given.

Some researchers argue that capital structure decisions may be affected by the conditions related to the capital supply. Barry, Mann, Mihov, and Rodriguez (2008) examine the relation between debt issues and the level of interest rates relative to historical levels by using a sample that comprises more than 14.000 new issues of corporate debt for the period 1970-2001. They find that companies issue more debt, more debt relative to investment spending, and more debt compared to equity when interest rates are low relative to historical rates. Henderson, Jegadeesh and Weisbach (2006) examine the extent to which firms from different countries rely on alternative sources of capital, the locations in which they raise capital, and the factors that affect these choices. Their results indicate that for some of the countries in their sample, firms issue more long-term debt when the interest rates are lower, and prior to increases in interest rates.

Stock market conditions' influence on the capital structure decisions of firms has also been investigated. Henderson, Jegadeesh and Weisbach (2006) indicate that firms are more likely to issue equity when the stock market appears to be overvalued. They find that

stock market returns are abnormally low following periods of high equity issues. The empirical researches considering various attributes of stock markets will be summarized in Chapter 4.

Some researchers argue that the macroeconomic conditions may influence the capital structure decisions of the firms. Frank and Goyal (2009) shows that when inflation is expected to be high, firms tend to have high leverage. Korajczyk and Levy (2003) examine the determinants of time variation in firms' leverage ratios and security issue choices between 1984 and 1998. They split their sample into two subsets, financially constrained and financially unconstrained. They define financially constrained firms as the set of firms that do not have sufficient cash to undertake investment opportunities and that face severe agency costs when accessing financial markets. They estimate the relation between firms' debt ratio and (1) firm-specific variables and (2) macroeconomic conditions. They use the fitted values of this relation to estimate firms' target capital structures. They then investigate the relation between security issuances/repurchases, the deviation from target leverage, and both firm-specific and macroeconomic variables. Their results demonstrate that the leverage of firms in the financially unconstrained sample varies counter-cyclically with macroeconomic conditions. On the other hand, firms in the financially constrained sample have pro-cyclical leverage as to macroeconomic conditions. They argue that at the issue-choice stage firms consider how far they are from their target leverage as well as the marginal costs associated with issuing equity or debt security. The empirical evidence supports that unconstrained firms are able to time their issues to periods when the relative pricing of the asset is favorable. However, constrained firms deviate from their target by less and their issue choices are much more sensitive to deviations from their target.

CHAPTER 4

CROSS-COUNTRY COMPARISON OF CAPITAL STRUCTURE DECISIONS

After Modigliani and Miller's seminal work in 1958, hundreds of theoretical and empirical studies have been conducted. It may be argued that significant progress have been achieved in theory development. The most important departures from the Modigliani and Miller assumptions that make capital structure relevant to a firm's value are well-defined. However, empirical evidence about different theories has provided contradictory results. Though empirical work has unearthed some facts on capital structure choice, the evidence is largely based on firms in the United States. Without testing the robustness of these findings outside United States, it is hard to determine whether these empirical regularities are merely spurious correlations or they support one theory or another. The studies focusing on capital structure decisions in countries other than United States date back only to late 90s. In addition to the need for robustness check of empirical evidence, contradictory results lead the researchers to seek determinants of capital structure other than the firm-specific ones which lack explanatory power. The increasing availability of data pertaining to developing countries in particular, enable the researchers to investigate the effects of additional variables and make cross-country comparison as to traditional variables as well. In this chapter, some of these empirical studies will be discussed briefly.

4.1.Macroeconomic Factors and Institutional Settings

Some researchers investigate how firm characteristics relate to capital structure across many countries in order to identify the economic forces and institutional differences

underlying leverage factors. Through cross-country comparison, they attempt to demonstrate the strengths and shortcomings of different theories.

Rajan and Zingales (1995) investigate the determinants of capital structure in G-7 countries, namely US, Japan, Germany, France, Italy, UK, and Canada. Their primary objective is to identify whether the capital structure in other countries is related to the factors same as those that seem to affect the capital structure of firms in US. They use the accounting data of non-financial corporations of the G-7 countries belonging to the 1987-1991 period. They rank the countries with respect to various measures of leverage such as debt to total assets or debt to capital. The leverage of firms in UK and Germany are substantially lower than the remaining five countries which have similar leverage ratios. The comparison of the leverage of companies belonging to the smallest 20 percent and to the largest 20 percent of the distribution of firms sorted by the market value of assets in 1991 reveals that independent of the size of the firm, firms in the United Kingdom and Germany are less levered while all the other countries are approximately at the same level, with rankings based on the specific measure of leverage. The authors examine the institutional differences of the G-7 countries in order to better explain the within country cross-sectional correlation between leverage and the firm specific factors such as profitability. They compare the countries with respect to tax treatment of interest and dividends, bankruptcy law, bank vs. market orientation, and the level of ownership concentration. Regarding the effect of taxes, they compute tax advantage of debt with respect to retained earnings, and dividend by assuming the marginal personal tax rate of an average investor in each country. They define the average investor as the head of a family of three earning three times the per capita income. The comparison of the leverage ratios of the G-7 countries reveals that whether the taxes have explanatory power or not is highly sensitive to assumptions about the marginal investor's tax rate. As an example, a tax-exempt investor finds debt more tax advantaged in Germany than in the United States (tax advantage of 50 versus 28 percent). However, if an investor who is taxed at the top marginal tax rate in each of the two countries is considered, the conclusion is opposite (-6 versus 28 percent). Bankruptcy code, bank vs. market orientation, and the level of

ownership concentration do not have significant effect on the leverage levels of the G-7 countries either.

Rajan and Zingales (1995) estimate the regression of leverage on tangibility, market to book ratio, firm size and profitability for each country separately and attempt to explain the discrepancies in results with institutional differences. The results show that the factors identified to be related to leverage by previous cross-sectional studies in the United States are significant in other G-7 countries as well. These factors explain, on average, about 19 percent of the cross-sectional variation in other countries (the explanatory power ranges from 5 to 30 percent). The authors conclude that although the observed correlations are not completely spurious, the existing theories do not suffice to explain the differences among G-7 countries.

La Porta, Lopez-De-Silanes, Shleifer and Vishny (1997) investigate legal determinants of external finance. They argue that legal rules protecting investors and the quality of their enforcement differ greatly and systematically across countries depending on the origin of the legal system, which is English, French, German, or Scandinavian. They examine the features of the legal environment for each legal system with special focus on the rules governing the creditor and shareholder's rights. They classify 49 countries into one of the four legal origins, and compare external finance levels as a function of the origin of their laws, the quality of legal investor protections, and the quality of law enforcement. They do a series of regressions of debt and equity market size measures of countries on various variables such as GDP growth, rule of law, anti-director rights etc. They use dummy variables for legal origins of the countries. They find that good law enforcement has significant effect on the valuation and breadth of both debt and equity markets. The results present that French and Scandinavian civil law countries do have more narrow debt markets than common law countries, a difference not adequately captured by creditor rights index. They also present large systematic differences between countries from different legal origins in the size and breadth of their capital markets. Whether measured by market capitalization of equity, by the number of listed firms, or by IPOs, common law countries have larger equity markets than civil law, and particularly French civil law countries. The measure of creditor rights is less effective in capturing the difference

between legal origins than the measure of shareholder rights. The authors also analyze the effect of legal origin on the market capitalization and debt level of firms rather than countries normalized by sales and cash-flow. The key issue about the sample used is that it covers primarily large firms that may have exposure to international capital markets, access to government finance, and captive banks. The results do not exhibit significant effect of legal origin on the debt level of firms. The similarity of the debt numbers across legal origins suggests large publicly traded firms get external debt finance in almost all countries, regardless of legal rules.

Booth, Aivazian, Demirgüç-Kunt and Maksimovic (2001) analyze the capital structure choices of firms in 10 developing countries: India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea. Their focus is on answering three questions:

1. Do corporate financial leverage decisions differ significantly between developing and developed countries?
2. Are the factors that affect cross-sectional variability in individual countries' capital structures similar between developed and developing countries?
3. Are the predictions of conventional capital structure models improved by knowing the nationality of the company?

Their source of data is primarily the International Finance Corporation. They use balance sheets and income statements from 1980 to 1990 pertaining to the largest companies of the countries. They calculate firm's total book-debt ratio as its total liabilities divided by total liabilities and net worth. They also calculate long-term liabilities, divided by long-term liabilities plus net worth and for seven countries, a market long-term debt ratio by substituting the average equity market value for net worth. The total book-debt ratio varies from a low of 30.3 percent in Brazil to a high of 73.4 percent in South Korea. Regarding their debt ratios, the countries are classified into high, middle and low-debt countries. According to total and long book-debt ratio, Brazil, Mexico, Malaysia, and Zimbabwe fall into a low-debt group. High debt group consists of South Korea, India, and Pakistan. Jordan, Turkey, and Thailand constitute the middle-debt group. They compare

the debt level of the countries in their sample with the countries included in Rajan and Zingalez (1995). They note that the difference between the total book-debt and long-term debt ratios is much more pronounced in developing countries than it is in the developed countries.

Booth et al. (2001) examine the macroeconomic influences on the countries' aggregate capital structure levels. Including the seven developed countries of Rajan and Zingalez (1995) they regress the debt ratios on stock market value/GDP, liquid liabilities/GDP, real GDP growth rate, inflation rate, and Miller tax term for 17 countries. Because the regression with only 17 countries produces very large standard errors for the coefficients, the coefficients are not significant to make judgment. However, the authors make some generalizations by looking at the signs of the coefficients. The results show that higher real economic growth tends to cause the two book-debt ratios to increase, and higher inflation causes them to decrease. According to the authors this implies that companies can borrow against real, but not inflationary growth prospects. The Miller tax term is significant in two of the three regression equations. The authors infer from the tax term that more debt is used in those countries that assign a higher tax advantage to debt financing.

Booth et al. (2001) further analyze the capital structure determinants of the firms for each country separately. They consider the impact of taxes, agency conflicts, financial distress, and the impact of informational asymmetries in identifying the possible determinants of capital structure. They calculate an average tax rate for the firms using the data on both earnings before and earnings after tax. They estimate the probability of financial distress or business risk as the variability of the return on assets over the available time period. They calculate the return on assets as the earnings before interest and tax divided by total assets. The tangibility of the firm's assets and its market-to-book ratio are proxies for agency costs and the costs of financial distress. They define the tangibility of assets as total assets minus current assets divided by total assets, and the market-to-book ratio as the equity market value divided by net worth. The authors use the return on assets as the measure of profitability, and the natural logarithm of sales as the measure of size of

the firms. The empirical model is a cross-sectional regression of the three different measures of the firm's debt ratio against the firm's tax rate, the standard deviation of its return on assets, the tangibility of its assets, the natural logarithm of its sales, its return on assets, and its market-to-book ratio. The authors do the analysis by both pooling the data and using fixed effects model. The results do not indicate uniform relationships between the debt ratios and the independent variables. The sign on the average tax rate is generally negative, but turns positive for three countries when the fixed effects model is applied. Similarly, although the sign on asset tangibility is consistently negative for Brazil, India, Pakistan, and Turkey, it varies between the different estimation techniques for other countries. The coefficient on business risk is negative for six countries and positive for four. The size variable is generally positive and highly significant for many of the countries, particularly when the fixed effects model is used. The sign on the market-to-book ratio is generally positive, except for South Korea and Pakistan. The most successful of the independent variables is profitability, as it is consistently negative and highly significant. The size of the coefficient is generally around -0.6 for the fixed-effects model, indicating that a 10 percent difference in profitability is associated with a 6 percent reduction in the debt ratio. Comparing with the results of Rajan and Zingales (1995) obtained for G-7 countries, the authors note that the factors that influence capital structures choice are similar between developed and developing countries. However, the signs on some of the coefficients, particularly business risk and the market-to-book ratio, are sometimes the opposite of what is expected.

Booth et al. (2001) also pool the data and run one model including all the countries. First, they regress the debt ratios on the country dummies solely. For the total debt ratio all the coefficients except for Pakistan and Thailand are significant. For the long-term book-debt ratio, the results are identical, but the overall explanatory power of the country dummies is lowered. They run the same model by including the firm-specific variables. The firm specific coefficients are almost identical in both cases (i.e. with or without dummies). The pooled model suggests that total-debt ratios decrease with the tangibility of assets, profitability, and the average tax rate and increase with size. The market-to-book ratio and business risk are important in isolation, but tend to be subsumed within country

dummies. Comparing the adjusted R^2 values of the pooled models, the authors also judge that the financial variables are less informative than knowing the firm's country.

Antoniou, Guney and Paudyal (2008) examine the implications of the financial orientation of the economy on the capital structure decisions of the firms in a country. They argue that understanding of the implications of the traditions of capital market-oriented and bank-oriented economies on the capital structure decision is important since they have direct impact on the sources of funds available to the corporate sector. They analyze the determinants of capital structure in the G-5 countries, which have different financial and institutional traditions. These countries include the U.S. and the U.K. which have capital market-oriented economies with high transparency and investor protection, and France, Germany, and Japan which have bank-oriented economies with lower transparency and investor protection. The sample constitutes of non-financial firms traded in the major stock exchanges of the G-5 countries with at least five annual consecutive observations from 1987 to 2000. The variables considered in their model related to the firm characteristics are profitability, growth opportunities, tangible assets, effective tax rate, earnings volatility, non-debt tax shield, dividend payout ratio and share price performance. Profitability is measured with ratio of operating profit to book value of total assets. Growth opportunities is proxied by the ratio of book value of total assets less book value of equity plus market value of equity to book value of total assets. Ratio of net tangible assets to total assets is used for tangibility. Effective tax rate is the ratio of total tax to total taxable income. Earnings volatility is taken as the first difference of annual earnings (% change) minus average of the first differences. Non-debt tax shield is measured with the ratio of depreciation to total assets. Dividend payout is the ratio of ordinary dividends to net income for each year, and the share price performance is measured with the annual change in the share price. Antoniou et al. (2008) also incorporate several factors as control variables into the model. Equity premium measured as the difference between the annual return on the stock market index (FT-All Share) and the return on three-month Treasury bills (annualized) is one of those control factors. The annualized difference between the yields on long-term government bonds and three-month Treasury bills is used to control for the effect of term structure of interest rate on the capital structure decisions. Another

control factor M&A activity is the number of the M&A deals in an industry in a given year divided by the total number of M&A deals in the country during the year. The indices and ratios used by La Porta et al. in various studies related to rule of law, ownership concentration, creditor rights and anti-director rights are also included as control factors in the model.

First, Antoniou et al. (2008) pool the data of all five countries and estimate Equation 13 with four country dummy variables representing Germany, Japan, U.K., and U.S.

$$Y_{it} = \alpha_0 + \alpha_1 Y_{i,t-1} + \sum_{k=1} \gamma_k X_{k,it} + D_j + \mu_i + \eta_t + \varepsilon_{it} \quad (13)$$

where, Y_{it} is a measure of leverage (book or market leverage) of firm *i* in year *t*; ***X*** represents the vector of explanatory variables; μi represents time-invariant unobservable firm-specific effects (e.g., management performance, reputation, and capital intensity); ηt represents time-specific effects (e.g., stagflation, inflation rates, and demand shocks), which are common to all firms and can change through time; α_0 is the constant; and α_1 and γk are unknown parameters to be estimated. The vector of explanatory variables, ***X***, includes *k* factors (*k* = 1, . . . , 12). These are measures of: i) profitability, ii) growth opportunities, iii) tangibility of assets, iv) firm size, v) effective tax rate, vi) earnings volatility, vii) dividend payout, viii) non-debt tax shields, ix) share price performance, x) equity premium, xi) term structure of interest rates, and xii) M&A activity. The results obtained by applying two-step system-Generalized Method of Moments indicate that the market leverage of firms operating in the G-5 countries declines with an increase in their profitability, growth opportunities and effective tax rate. The effect of non-debt tax shields on market leverage is positive and significant. The payout policy does not have a significant effect on capital structure decisions of firms operating in the G5 nations. The estimates further show that larger firms and firms with higher tangible assets borrow more. The positive effect of equity premium on market leverage implies that firms raise debt capital at times of high market equity premia. Further, the term structure of interest rates, share price performance, and M&A activity are all inversely related to a firm's market leverage. These estimates confirm that firms avoid issuing debt when the long-term interest

rate is relatively high. The statistically significant coefficient of the lagged dependent variable implies that firms have a target capital structure. Finally, all of the coefficients of the country dummies are statistically significant, implying that there are country-specific effects which are not specified in the model.

Equation 13 is reanalyzed by including measures of the rule of law, ownership concentration, creditors' rights, and anti-directors' rights. Due to the multicollinearity problem, the factors are included in the model in different combinations and analyzed sequentially. The coefficient of rule of law is negative and significant. The authors judge that since the higher rule of law implies more efficient law enforcement regulations including bankruptcy laws, firms in countries with a higher rule of law index may keep their leverage ratio lower to avoid bankruptcy. They argue that firms with concentrated share ownership favor debt as opposed to external equity to prevent possible dilution of ownership and control. Therefore, the positive effect of ownership concentration supports their view. The positive effect of creditors' rights on leverage is self-explanatory as higher creditors' protection reduces the risk premium in the cost of borrowing and makes borrowing easier for the firms. The anti-director rights index also has a positive effect on leverage because when this index is higher, the information asymmetry between managers and external investors is reduced, hence firm's debt capacity increases.

Next, Antoniou et al. (2008) estimate Equation 13 for each country separately. The results reveal a significant inverse relation between profitability and market leverage in all sample countries except Japan where profitability has a positive effect. The coefficients differ for each of the four countries dependent on the country-specific features. The coefficients for growth opportunities are negative in all countries, except in U.S where it is insignificant. A cross-country comparison reveals the lowest impact in Germany. The authors interpret this as an evidence of limited opportunity for managers to pursue their own objectives due to the large shareholders of German firms who better monitor managers. The relation between leverage and the tangibility of assets is significantly positive in all G-5 countries, apart from the U.S. The effect of asset tangibility on corporate debt is more prominent in bank-oriented (France, Germany, and Japan) than in capital market-oriented economies (the U.S. and the U.K.). The smaller (or insignificant)

coefficients for asset tangibility in the U.K. and the U.S. are explained by the authors with the arm's length relation of the firms with their lenders in these countries which reduces the need for collateral in raising debt.

The size of the firm is positively related to leverage in all G-5 countries, apart again from the U.S. The coefficients of earnings volatility are not significant for any of the country. Similarly, the role of an effective tax rate on market leverage is not statistically significant in any country. The results reveal that firms with higher non-debt tax shields borrow less in Germany, Japan, and the U.K. whereas this relation is found to be positive in France. The effect of the dividend payout ratio on capital structure also appears to be country dependent because it is significantly negative in the U.S. but insignificant in all other countries. As to share performance the results suggest that market leverage declines after an increase in share price in all countries except the U.K., and hence imply that managers tend to issue more equity after a positive share price movement.

The relation between the equity premium and the leverage differs from country to country. Market leverage is inversely affected by equity premium in France, Germany, and the U.S., while it is positively affected in Japan and the U.K. The results also reveal a significant negative relation between the term structure of interest rates and leverage in all sample countries except Germany. The authors explain this evidence with the view that when long-term interest rates are relatively high, firms are reluctant to raise debt capital. M&A activity seems to influence the capital structure decision of managers of firms operating in Japan, the U.K., and the U.S. Firms operating in these countries seem to borrow less when the market for M&A is more active in order to avoid financial distress while predators are active. However, this variable has no significant impact on the capital structure decisions of firms operating in France and Germany.

Lopez-Iturriaga and Rodriguez-Sanz (2008) argue that classification of countries with respect to bank vs. market based scheme is inexact. This scheme relies on two differentiated levels of financial leverage and Anglo-Saxon firms are usually less leveraged than their Continental counterparts. However, there are some countries, such as Germany, which are the least leveraged ones although they are supposed to belong to the bank oriented model. Therefore, they suppose another classification scheme which is based on

the legal origins of each country. They view that the legal origins determine the characteristics of each system. The creditors' and shareholders' rights, law enforcement, the quality of accountancy and ownership concentration may differ considerably depending on the legal system of a country. In order to test whether the level of leverage and maturity of debt is dependent on the legal system of a country, the authors select 10 countries from different legal origins. Their sample includes data from Austria and Germany as civil law countries with the German tradition, from Canada, the USA and the United Kingdom as common law countries and from Italy, France, Spain, the Netherlands and Belgium as civil law countries with the French tradition. They use three different measures of capital structure by including commercial debt, deferred taxes and nontaxable reserves in different ways. In the first step they compare the level of debt across legal systems and test the existence of possible significant differences through the analysis of variance (ANOVA). ANOVA results show that the equality of means across the three groups be rejected with a confidence level higher than 99%. The level of financial leverage is significantly different across groups of countries and corroborates the fact that firms from the French tradition of civil law countries are the most leveraged, whereas their German civil law counterparts are those with the least leverage. As regards to maturity, while Anglo-Saxon firms are those with the highest long term debt ratio (19.4%), the German civil law firms are those with the lowest long term debt (9.6%). On the contrary, when only short term debt is considered, French civil law firms are the most leveraged companies whereas Anglo-Saxon firms are the least ones. The results suggest that common law firms appear to be more prone to long term debt whereas civil law firms tend to borrow for short term.

After checking the differences between legal systems in terms of capital structure, Lopez-Iturriaga and Rodriguez-Sanz (2008) test whether the factors determining firms' financial choices are responsible for those differences. They consider growth opportunities, firm size, firm performance (EBITDA) and assets tangibility as determinants of leverage. The regression analysis with the method of panel data has been applied over the entire sample, for the Anglo-Saxon, the French and the German tradition of civil law system successively. The results demonstrate a common pattern for the four explanatory variables in all the legal systems and for all the measures of capital structure. Growth opportunities

and firm performance are proved to have a negative and significant relation with financial leverage, whereas the size of the firm and the assets tangibility is positively related. In order to explain how the same factors could produce such large differences across the legal systems, they introduce two country specific dummy variables which are related to the legal and institutional framework: law enforcement and the quality of accounting. These dummy variables have interacted with the four explanatory variables in order to test if they have differential effects conditioned by the law enforcement and the quality of accounting. The results show that the interacting variables are quite significant. Therefore, the authors assert that growth opportunities, the size and performance of the firm and the assets tangibility have a different effect depending on those two characteristics. They suggest that different levels of leverage are not per se a result of the legal environment, but that the legal setting creates the conditions so that firm specific factors have a differential impact. Lopez-Iturriaga and Rodriguez-Sanz (2008) replicate the regressions with the GMM to control for the possible endogeneity of the explanatory variables. Results are almost the same, but the second order serial correlation raises doubt in analyzing GMM results since the weakness of the instruments reduces the efficiency of the estimations and increases the possible bias.

Jong, Kabir and Nguyen (2008) investigate both direct and indirect impact of country-specific factors on the leverage of firms. They assert that country-specific factors can influence leverage indirectly through their impact on the effect of firm-specific factors. They construct a database of nearly 12,000 firms of different size operating in 42 countries from every continent for the period 1997–2001. They measure the leverage (LEV) with the book value of long-term debt over the market value of total assets. The firm-specific determinants of leverage they use include; tangibility defined as net fixed assets over book value of total assets (TANG), business risk defined as the standard deviation of operating income over book value of total assets during the sample period (RISK), firm size defined as the natural logarithm of total sales (SIZE), tax rate of firms which is the average tax rate of the year (TAX), growth opportunity defined as the market value of total assets over book value of total assets (GROWTH), profitability defined as operating income over book value of total assets (PROFIT) and liquidity calculated as total current assets divided by

total current liabilities (LIQUID). First, the authors run firm-level ordinary-least squares regressions with leverage as the dependent variable and country's firm-specific factors as explanatory variables for each of the 42 countries as follows:

$$LEV_{ij} = \beta_{0j} + \beta_{1j}TANG_i + \beta_{2j}RISK_i + \beta_{3j}SIZE_i + \beta_{4j}TAX_i + \beta_{5j}GROWTH_i + \beta_{6j}PROFIT_i + \beta_{7j}LIQUID_i + \varepsilon_i \quad (14)$$

The cross-sectional regressions yield as many as 36 significant positive coefficients for TANG. They find 21 positively significant coefficients for SIZE. With respect to RISK, there are only 14 significantly negative regression coefficients. In ten countries, TAX variable has significant coefficient. However, only two out of ten significant coefficients are positive. GROWTH has negative and significant coefficients in 24 countries. The expected negative relation between PROFIT and LEV is found in 25 countries. Only in 13 countries the coefficients for LIQUID are significant.

Jong, Kabir and Nguyen (2008) argue that the procedure of pooling firms from different countries into one regression model wrongly forces different firm-specific coefficients to be equal. In order to test the hypotheses that each of these seven firm-specific coefficients is equal across countries, they utilize an *f*-test. The result implies that it is not valid to construct a model by pooling all companies in the world and test the impact of factors assuming that cross-country firm specific determinants are equal. Therefore, they adopt the following methodology to analyze the direct impact of country-specific variables on leverage. In the first step, they run a simple pooled OLS regression for all firms in all countries, taking into account cross-country differences via country dummies.

$$LEV_{ij} = \sum_{j=1}^{42} \alpha_j\, d_j + \sum_{j=1}^{42} \beta_{1j} d_j TANG_{ij} + \sum_{j=1}^{42} \beta_{2j} d_j RISK_{ij} + \sum_{j=1}^{42} \beta_{3j} d_j SIZE_{ij} + \sum_{j=1}^{42} \beta_{4j} d_j TAX_{ij} + \sum_{j=1}^{42} \beta_{5j} d_j GROWTH_{ij} + \sum_{j=1}^{42} \beta_{6j} d_j PROFIT_{ij} + \sum_{j=1}^{42} \beta_{7j} d_j LIQUID_{ij} + u_{ij} \quad (15)$$

where d_j is the country dummy. In the second stage, they regress country dummy coefficients α_j, which are the countries' leverages after correcting for impacts of firm-

specific determinants, on the country-specific variables. The regression specification is as follows:

$$\widehat{\alpha_j} = \gamma_0 + \gamma_1 STDENFORj + \gamma_2 CREDITORj + \gamma_3 BONDj + \gamma_4 STDMKTSTOCKj + \gamma_5 SHAREHOLDERj + \gamma_6 CAPITALj + \gamma_7 GDPj + w_j \quad (16)$$

$STDENFORj$, is the standardized enforcement index measuring the efficiency and integrity of judicial system. $CREDITORj$ is an index measuring creditor rights protection. $BONDj$ is the proxy for the development of bond market defined as the total (private plus public) bond market capitalization over GDP, average through 1997–2001. $STDMKTSTOCKj$ is calculated by taking the average of standardized *MKTBASE* and standardized *STOCK*. *MKTBASE* is a dummy variable that equals 1 if the country's financial system is market-based and 0 if it is bank-based. *STOCK* is defined as the stock market capitalization over the country's GDP, average through 1997–2001. $SHAREHOLDERj$ is an index measuring shareholder right protection. $CAPITALj$ is defined as the average of annual gross capital formation (as a proportion of GDP) in each country, averaged through 1997–2001. $GDPj$ is defined as the average of annual real GDP growth rate of each country, averaged through 1997–2001. The observations for the dependent variable are the estimators of α_j in Equation (15). Equation (16) estimates the direct impact of country-specific variables on leverage. In order to estimate the indirect impact of country-specific variables, the following regression specification is solved.

$$\widehat{\beta_{kj}} = \lambda_0 + \lambda_1 STDENFORj + \lambda_2 CREDITORj + \lambda_3 BONDj + \lambda_4 STDMKTSTOCKj + \lambda_5 SHAREHOLDERj + \lambda_6 CAPITALj + \lambda_7 GDPj + e_k \quad (17)$$

$\widehat{\beta_{kj}}$ is the estimated regression coefficients of all firm-specific variables TANG, RISK, SIZE, TAX, GROWTH, PROFIT, and LIQUID for country j from Equation (14).

The authors find that the level of bond market development and GDP growth rate have positive impact on leverage. However, creditor right protection has a significantly

negative impact on the leverage. The authors argue that higher creditor right protection may make debt more risky for firms since firms are likely to be forced into bankruptcy in times of financial distress. Therefore, firms are more reluctant to borrow as debt contracts are more stringent.

The results also indicate that country-specific factors have an impact on the roles of firm-specific determinants of capital structure. The variable representing market/bank-based financial system and stock market development (STDMKTSTOCK) has significantly negative impact on the estimated coefficient of asset tangibility. The authors comment that a developed stock market mitigates the use of debt as it instead promotes the use of equity. As a result, the role of tangibility as collateral in borrowing is limited. The coefficients for CAPITAL are significantly negative for the case of profitability and liquidity. The authors argue that the negative impact of profitability and liquidity on leverage is further strengthened when more domestic capital funds are accumulated. They also observe that a country's legal system of enforcement (STDENFOR) has a negative impact on firm size coefficients which indicates that firm size is relatively less important for leverage choice of firms. As firm size is a reverse proxy of bankruptcy cost/risk, better law enforcement is likely to force borrowers to abide by their debt contracts.

Kayo and Kimura (2011) assume that capital structure determinants can be nested in at least three levels: level 1 (time), level 2 (firm characteristics) and level 3 (the industry/country interaction). Because of the multilevel nature of these determinants, they use hierarchical linear modeling (HLM) – also called multilevel analysis – with maximum likelihood estimation in order to assess all levels simultaneously. They argue that through the adoption of HLM, the problems of correlated residuals across firms and years are mitigated. Their sample includes all nonfinancial companies of 40 countries that have more than 100 firm/year observations and a positive book value from 1997 through 2007. In the first step of analysis, they develop the so-called empty model, in which they do not include independent variables. By this way, they initially ignore fixed effects and the focus is on random effects. HLM empty model estimates the relative importance of each level in the variance of leverage. Equation 18 shows the specification of the first level, where the leverage (LEV_{ijkl}) of the year i, of the firm j, within the industry k and country l is a

function of the mean leverage of firm j within industry k and country l (β_{0jkl}) plus a random error (e_{ijkl}).

$$\text{LEV}_{ijkl} = \beta_{0jkl} + e_{ijkl} \quad (18)$$

In the second level of analysis the mean leverage across time of firm j of the industry k and country l (β_{0jkl}) is formulated as a function of a mean leverage of industry k at country l (γ_{00kl}) plus a random error (r_{0jkl}) representing the variance between firms as given in Equation 19.

$$\beta_{0jkl} = \gamma_{00kl} + r_{0jkl} \quad (19)$$

In the third level, the mean leverage of the industry k in country l (γ_{00kl}) is a function of the grand mean of the sample (δ_{0000}) plus the random errors of the industry (s_{00k0}), country (t_{000l}), and the crossed random error of industry and country (u_{00kl}).

$$\gamma_{00kl} = \delta_{0000} + s_{00k0} + t_{000l} + u_{00kl} \quad (20)$$

Model 1 is obtained by consolidating the equations 18 to 20. After variance decomposition of leverage is obtained through the empty model, Model 2 is obtained by including growth opportunities ($GROW_{ijkl}$), profitability ($PROF_{ijkl}$), distance from bankruptcy ($DBKRT_{ijkl}$), size ($SIZE_{ijkl}$), tangibility ($TANG_{ijkl}$) and the dummy variable ($YEAR_{ijkl}$) in the basic model as determinants of random intercepts:

$$\text{LEV}_{ijkl} = \beta_{0jkl} + \beta_{1jkl}(YEAR_{ijkl}) + \beta_{2jkl}(GROW_{ijkl}) + \beta_{3jkl}(PROF_{ijkl}) + \beta_{4jkl}(DBKRT_{ijkl}) + \beta_{5jkl}(SIZE_{ijkl}) + \beta_{6jkl}(TANG_{ijkl}) + e_{ijkl} \quad (21)$$

Next, the variables related to the industry, namely munificence ($MUNIF_{00kl}$), the dynamism ($DYNAM_{00kl}$) and the concentration (HH_{00kl}) of each industry k at the country l are added to the empty model at the industry level in order to specify Model 3:

$$\beta_{0jkl} = \gamma_{00kl} + \gamma_{01kl}(MUNIF_{00kl}) + \gamma_{02kl}(DYNAM_{00kl}) + \gamma_{03kl}(HH_{00kl}) + r_{0jkl} \quad (22)$$

Industrial dynamism reflects the degree of instability or non-predictable change of a given industry. Munificence is the environment's capacity to support a sustained growth. They obtain munificence by regressing time against sales of an industry over the previous 5 years of the period under analysis and taking the ratio of the regression slope coefficient to the mean value of sales over the same period. Dynamism is the standard error of the munificence regression slope coefficient divided by the mean value of sales over this period. Industrial concentration is measured with Herfindahl–Hirshman (HH) index which is defined as the sum of the squares of market shares of firms within a given industry. The market share of a firm is given by the ratio of its sales to the total sales in the industry. The authors refer to Equation 23 as Model 4 which is obtained by including stock market development at country l (STK_{000l}), bond market development at country l ($BOND_{000l}$), a dummy variable (MKT_{000l}) that equals 1 if the financial system of the country l is market-based or zero if bank-based, and the annual growth of gross domestic product of country l (GDP_{000l}) in the empty model in the third level.

$$\gamma_{00kl} = \delta_{0000} + \delta_{0001}(STK_{000l}) + \delta_{0002}(BOND_{000l}) + \delta_{0003}(MKT_{000l}) + \delta_{0004}(GDP_{000l}) + s_{00k0} + t_{000l} + u_{00kl} \quad (23)$$

Kayo and Kimura (2011) first conduct variance decomposition analysis through the estimation of the empty models. Their results show that firm-level accounts for 42.5% of the leverage variance, whereas time level, industry level and country level account for 35.6%, 11.6% and 3.3% of the variance, respectively. They derive from the results that the time and firm levels are mainly responsible for the majority of leverage variance. Although industry and country characteristics are subject to change, such change is more likely to occur over a long period. However, firm characteristics tend to be more dynamic and volatile. The authors note that they cannot argue industry-and country-levels are less important just because their roles in leverage variance are lower. They express that the portion of industry and country levels in the variance of leverage is lower only because they vary less than firm leverage. The results obtained by the inclusion of industry- and country-level covariates show that some characteristics of these levels are actually significant to explain firm-level leverage.

Two firm variables – tangibility and size – show a positive and significant relation with leverage, whereas growth opportunities and profitability have negative and significant impact. As to industry level variables, both munificence and dynamism show negative and significant relationships with leverage. The results indicate that companies working in industries with good growth opportunities (i.e., greater munificence) and larger risk because of a more dynamic environment (i.e., larger dynamism) tend to use less leverage. Industry concentration (HH index) is also negatively related to leverage, indicating that high concentrated industries may lead their firms to have a lower debt. The results of Model 4 in which the macroeconomic variables are added reveal that stock market development reduces firm leverage. As companies have an alternative to finance investments and growth through a more developed equity market, they prefer to have less leverage. On the other hand, bond market development shows a negative relation with leverage contrary to the expectation of positive relationship. GDP growth also has a negative relationship with debt, a result that is expected because GDP growth indicates a good growth opportunity. The only variable that is not statistically significant is financial system. Firm leverage is not affected with respect to country financial system being market- or bank-based.

Fan, Titman and Twite (2012) examine how institutional differences between countries can affect capital structure and debt maturity choices of firms. Their sample consists of 36,767 firms from 39 countries which have firm level data for the period 1991–2006. The institutional variables they include in the model reflect i) the ability of creditors to enforce legal contracts, ii) the tax treatment of debt and equity, and iii) the importance and regulation of financial institutions that represent major suppliers of capital. The variables related to the legal system of the country are namely *common law*, *corruption index* and *bankruptcy code*. *Corruption index* reflects the extent to which corruption is perceived to exist among public officials and politicians. It ranges from 1 to 10, with larger value indicating more severe corruption. *Common law* is a dummy variable that takes a value of 1 if the country's legal system is based on common law, and 0 otherwise, and *bankruptcy code* is a proxy for the existence of an explicit bankruptcy code which is measured as a dummy variable equal to 1 for those countries in which an insolvent firm

can undergo a court-supervised reorganization proceeding. As a proxy for the tax treatment, they estimate the Miller (1977) tax ratio for each country as given in Equation 24:

$$1 - \frac{(1-\tau_c)(1-\tau_e)}{(1-\tau_i)} \tag{24}$$

where τ_c is the statutory corporate tax rate, τ_i is the highest statutory personal tax rate on interest income, and τ_e is the highest effective personal tax rate on equity income coming from dividends. The variables used as proxies for the importance and regulation of financial institutions that represent major suppliers of capital are *deposits* (the country's deposits or liquid liability over GDP.), *deposit insurance* (dummy variable equal to 1 if bank deposits are insured by government.), *domestic savings* (the country's gross domestic saving over GDP), *insurance penetration* (sum of life and non-life insurance premiums over GDP), *pension fund regulation index* (the ratio of the proportional limit on equity holdings over the proportional limit on debt holdings of pension funds), *government bonds* (value of domestically denominated government bonds over GDP), *defined benefit pensions* (value of defined benefit pension fund assets over GDP) and *defined contribution pensions* (value of defined contribution pension fund assets over GDP).

Fan, Titman and Twite (2012) include a set of firm-level variables that are predicted to affect leverage and maturity structure. These variables are *asset tangibility* (fixed assets over total assets), *profitability* (net income over total assets), *firm size* (natural logarithm of total assets), *the market-to-book ratio* (market value of equity over book value of equity), and industry indicator variables based on 2-digit Standard Industrial Classification (SIC) codes. In addition to the firm- and country-level variables the authors include inflation, inflation volatility (measured as the standard deviation of inflation rates over the preceding 4 years), and a developed economy indicator variable that takes a value of 1 if the country is classified as a developed economy according to the World Bank classification that is based on the countries' gross national income levels. The leverage, measured as the proportion of total debt to market value of the firm is regressed on both firm-level and country-level variables by using the OLS method with heteroskedastic and autocorrelation corrected (HAC) errors clustered at the country level. The HAC procedure

accounts for the potential heteroskedasticity and autocorrelation at the firm level by deriving the t-statistics of estimated OLS coefficients from GMM standard errors corrected for heteroskedasticity and autocorrelation. The regressions are repeated for the full sample, for the subsamples of developed and developing economies separately, for the subperiods of 1991–1998 and 1999–2006, and for a subsample representing OECD countries. With regard to firm-specific variables, coefficient estimates indicate that leverage is positively related to asset tangibility and firm size and negatively related to profitability and the market-to-book ratio. These results hold in the full sample as well as the subsamples. The individual country regressions reveal that asset tangibility and size are positively related to leverage in 38 and 34 out of 39 countries, respectively. Profitability is negatively related to leverage in 36 out of 39 countries. The coefficients for the market-to-book ratio have the same sign in all country regressions. With regard to country-specific variables, the authors find that a country's legal and tax system, corruption, and the preferences of capital suppliers explain a significant portion of the variation in leverage. The coefficient estimates demonstrate that leverage is positively related to economic development, but unrelated to both inflation and inflation volatility. The regression results reveal that corruption is associated with higher debt ratios, common law systems are associated with lower debt ratios, and the existence of an explicit bankruptcy code is associated with higher debt ratios. They find that leverage is higher in countries where the tax gain from leverage is positive. The leverage is also higher in countries with deposit insurance, suggesting that the banking industry is important. On the other hand, they do not find a significant relation between the size of the banking sector, the size of the insurance industry, the level of domestic savings or the size of the government bond market with leverage.

The results vary significantly between the subsamples. *Common law* and the *bankruptcy code* are significant in the sample of developed economies, but not in the sample of developing economies, while deposit insurance and the size of the government bond market are important in developing economies, but not in developed economies. Taxes are significant in the sample of developed economies, but not in the sample of developing economies, and only in the later time period. In addition, they find that the

level of domestic savings and the size of the government bond market are significant in the 1991–1998 subperiod, but not in the 1999–2006 subperiod, while taxes and deposit insurance are important in the later time period, but not in the former period.

4.2.Speed of adjustment to target ratio

As explained briefly in Chapter 2, the Trade-off Theory predicts that firms have an optimal capital structure and adjust their leverage toward the optimum over time. There are several studies in literature that investigate the factors that influence the speed of adjustment of firms toward optimal capital structure. Since the scope of this research does not encompass the speed of adjustment concept, in this subsection only the studies that examine the cross-country differences in terms of speed of adjustment have been explained briefly.

Antoniou, Guney and Paudyal (2008) develop the following model in order to estimate the speed of adjustment of firms in U.K., U.S., France, Germany and Japan.

$$Leverage_{it} = (1-\theta)Leverage_{it-1} + \sum_{k=1} \theta \Psi_k x_{kit} + \theta \omega_t \qquad (25)$$

where **X** is a vector of k explanatory variables; ωt is a serially correlated disturbance term with mean zero and possibly heteroskedastic; and ψks are unknown parameters to be estimated and common to all firms. In this model, the value of θ measures how quickly firms adjust their leverage ratio. If θ = 1, the actual change in leverage is equal to the desired change and the adjustment is transaction cost free. If θ=0, there is no adjustment in leverage. The absence of adjustment is possible when adjustment costs are excessively high, or the cost of adjustment is significantly higher than the cost of remaining off target, and firms set their current debt ratios to the past level, $Leverage_{it-1}$. The results indicate a significant and positive effect of the one-period lagged dependent variable, leverage, on the capital structure of firms in all of the sample countries. The coefficients are between zero and one implying that the leverage ratio converges to its desired level overtime. This supports the argument that firms adjust their leverage ratios to achieve their target. The

speed of adjustment varies across sample countries, being fastest among French firms followed by U.S., U.K., German, and Japanese firms, respectively. The slow speed of adjustment of German and Japanese firms is explained with the lower cost of being off target relative to the cost of adjustment for these two countries. Since German and Japanese firms have close ties with their creditors, it is feasible for them to adjust slowly toward their target level without incurring substantial agency costs. German and Japanese firms not only have easier access to debt finance, but they also need to rely less on using debt as a mechanism to signal firm quality to a large number of investors in capital markets as their counterparts need to do in market-oriented economies (the U.S. and U.K). The authors argue that managers assess the trade-off between the cost of adjustment and the cost of being off target and the speed at which they adjust their capital structure depends on the financial systems and corporate governance traditions of the country they reside.

Oztekin and Flannery (2012) hypothesized that a country's institutional and legal arrangements affect the costs and benefits of moving toward a firm's optimal leverage ratio, and this effect should be reflected in international differences in estimated speeds of adjustment. In order to evaluate the institutional determinants of measured adjustment speeds in different countries, they constitute a dynamic panel data set that spans 37 countries over 16 years. First, they estimate the same partial adjustment model of leverage, formulized in Equation 26, in each of the 37 countries.

$$Lev_{ij,t} = (\lambda_j \beta_j) x_{ij,t-1} + \left(1 - \lambda_j\right) Lev_{ij,t-1} + \lambda_j F_{ij} + \delta_{ij,t} \quad (26)$$

where β_j and F_{ij} are coefficient vectors to be estimated and $X_{ij,t-1}$ is a vector of firm and macroeconomic characteristics related to the costs and benefits of operating with various leverage ratios. The estimated speeds are all significantly positive and lie within the zero–one interval, consistent with a typical firm's capital structure converging to its optimal level over time. In line with prior literature, the results are similar for market value leverage (MLEV) and book value leverage (BLEV) for two alternative estimation methods: a two-step system generalized method of moments (GMM) and the bias-corrected least squares dummy variable approach. Across the sample of 37 countries, the sample mean estimated adjustment speed for BLEV is 21.11%. Equivalently, the average

firm takes approximately three years to close half the gap between actual and optimal capital structure.

Next, Oztekin and Flannery (2012) investigate the institutional effects on cross-country variations in adjustment speed. In order to determine whether any institutional effect, say trading costs correlate with firms' leverage adjustment speeds, they separate sample countries into two portfolios based on the median value of trading costs. They undertake two tests that differ in their treatment of potential cross-country differences in the formation of leverage targets. First, the SEPARATE test methodology estimates Equation 26 separately for each country, and they use a t-test to determine whether the two groups' average adjustment speeds differ significantly. The SEPARATE methodology permits each country to have its own coefficients in the leverage target. Second, they estimate Equation 26 across the firms residing in higher-than-median trading cost countries and then across all firms in lower trading cost countries. This POOLED procedure imposes common slopes (β) and adjustment speeds (λ) on all firms in similar countries. They then test whether the adjustment speeds differ between the two regressions. They use the first principal component of related subindices and dummy variables to represent a few, broad indices of each country's institutional environment: legal tradition (common versus civil), financial system organization (market- versus bank-oriented) and financial system aggregate quality (high versus low), ease of access to capital markets, asymmetric information, financial constraints, distress costs, tax shields, and deviation penalties. To assess the impact of these institutional features on estimated adjustment speeds, they separate sample countries into two portfolios according to the median value of one selected feature. They expect to find higher estimated adjustment speeds in the portfolios with lower cost (or higher benefit) institutional features.

The results indicate that higher trading costs in debt or equity markets reduce the adjustment speed by 3% to 9%. That is, international differences in adjustment speeds correlate with differences in the cost of transacting in bond and equity markets. As to legal and financial traditions, the authors find that firms in the common law countries adjust to optimal capital structure significantly faster than firms operating under civil law. The test results suggest that a market-based structure imposes lower costs of adjusting or higher

benefits of converging to a firm's optimal capital ratio, or both. Specifically, using the SEPARATE (POOLED) method, they find that firms in market-based financial systems adjust at an average annual rate of 23% (19%) while firms in bank-based financial systems adjust at an average rate of 20% (3%).

Oztekin and Flannery (2012) also investigate more narrowly defined features of each country's legal and institutional framework. They focus on specific institutional factors that might affect the costs and benefits of adjusting to target leverage. *Ease of Access* to capital markets variable which reflects both stakeholder rights and the quality of enforcement of those rights relates positively to estimated adjustment speeds. Firms in countries with above-median values for this index adjust 7.9%–11.8% faster. The results indicate that both equity and debt *Access Costs* affect the adjustment speed, but equity costs have a greater impact on adjustment speed (i.e., 6%–12% versus 2%–10%). The greater *Asymmetric Information* reduces the adjustment speed by a magnitude of 7.3%–10.7%. With regard to adjustment benefits, the adjustment speed is faster in countries with more binding ex ante distress costs. The higher ability to prevent ex post distress costs leads to faster adjustment ranging from 5% to 11% on average. The tax rate increases adjustment speeds significantly only in the SEPARATE test. More binding deviation penalties lead to faster adjustment of 8% to 9% on average.

Nivorozhkin (2005) investigates and compares the determinants of firms' target capital structure and the speed of leverage adjustments in five EU accession countries of Central and Eastern Europe and the former Soviet Union (Bulgaria, the Czech Republic, Poland, Romania and Estonia). He selects 729 Bulgarian companies, 976 Czech companies, 311 Estonian companies, 1219 Polish companies and 2477 Romanian companies with five consecutive years of reports and no missing statements. In addition, firms classified as financial intermediaries, utilities and public administration organizations are excluded from the sample because their financial decisions are likely to be influenced by regulation. The results indicate that the speed of adjustment of a firm's leverage tend to increase as the distance to the target leverage increases. The relationship between speed of adjustment and the variable DISTAN is significant in all countries, except Poland. The results show that the large adjustments of leverage become less costly relative to smaller

ones, which suggests the presence of fixed costs in changing the capital structure of a firm. The effect of company size on the speed of adjustment is negative and significant for Bulgaria, Estonia and Romania. A positive significant relationship is only observed for Poland. He explains the obtained results with supply side imperfections in lending policies. Since lending to a larger firm usually implies a higher exposure for a bank, larger companies may be unable to adjust as fast as smaller companies. The speed of capital structure adjustment of the companies in the first quintile (smallest companies) is 4–9% greater than the speed of adjustment of companies in the fifth quintile (largest companies) for Bulgaria, Estonia and Romania. The largest companies in Poland adjust 9% faster than the smallest companies. The speed of adjustments in the Czech companies is stable across size groups.

Cotei, Farhat and Abugri (2011) test the trade-off and pecking order theory simultaneously with a data sample which comprises 23 developed and 14 developing countries with different legal traditions and financial market developments. The results show that firms in common law countries have a significantly higher rate of adjustment toward target leverage relative to firms in civil law countries (39 versus 27 percent). The contribution of long-term debt in the speed of adjustment also varies with legal system. In civil law countries, long-term debt accounts for about 51 percent in total rate of adjustment, while in common law countries long-term debt shows a contribution of more than 64 percent in the rate of adjustment. The results imply that across all countries, firms adjust toward the target leverage, but with significantly different rate of adjustment depending on their legal systems. This result supports the view that stronger investor protection, higher transparency, and well-developed financial markets in common law countries reduce the cost of recapitalization.

CHAPTER 5

DATA AND METHOD OF ANALYSIS

As explained in previous chapters, there is a significant number of researches done before which focus on the firm-level determinants of capital structure. Though the number of researches examining the industry and country-level determinants is considerable, more studies are required in order to explain the differences across countries in terms of capital structure decisions of firms. Since the main goal of this study is to identify the cross-country differences, it is attempted to determine country-level factors which have not been examined in literature before. Since the variation in these factors is not sufficient for acquiring significant relationships in regression analysis particularly for developing countries, new method of analysis is adopted. The following sections present information about the variables and the method of analysis. Moreover, the features of the sample used in this study are given in this chapter.

5.1.Firm-Specific Factors

Firm data has been gathered from the *Thomson Reuters Datastream* database. Since the main scope of this study comprises the country-specific factors, the availability of data in the *Datastream* and the firm-specific factors mostly investigated in literature have been considered in identifying the factors to be used in the regression model. *Tangibility, size, growth opportunity, profitability,* and *liquidity* are the firm-specific factors which can be proxied by the data available for the firms operating in the countries of analysis. Because the information about the evidence of the previous researches examining these factors have

been presented in previous chapters, in this section the construction of the independent variables is explained exclusively.

Tangibility (TANG), which is a measure related to value of the fixed assets of a firm, is proxied by the ratio of *Net Fixed Assets* to *Total Assets*. *Net fixed assets* represents the book value of fixed assets less accumulated reserves for depreciation, depletion and amortization.

In previous research, *size (SIZE)* is used to estimate the scale of the asymmetry of information, and the agency costs. Similar to the previous research, *size* is measured with the natural logarithm of total annual sales of firms.

Growth opportunities (GROWOPP) is used to analyze whether investment opportunities create asset substitution and underinvestment problem. The previous studies measure the *growth opportunities* by the ratio of market value of total assets to book value of total assets. In *Datastream* database, market value of equity of firms is given. Therefore, the sum of market value of equity and total debt is divided by book value of total assets in order to measure the growth opportunity of a firm in this research.

Profitability (PROF) is a controversial factor since different theories hypothesize opposite signs for its relationship with the leverage. In order to estimate which theory is more relevant for a country, *profitability* is included in this research. Earnings before interest and taxes (EBIT) is divided by the total assets for the purpose of measuring the profitability of a firm.

Though volatility is one of the firm-specific determinants of leverage that has been widely investigated in academic research, the previous studies do not yield significant and consistent results. Moreover, it is difficult to estimate the volatility of firms especially in developing countries with the available data. Therefore, instead of volatility, *liquidity (LIQ)* which can be measured more precisely with the available data is embraced in the study. It is hypothesized that accumulated cash and other liquid assets serve as internal source of fund and will be used primarily instead of debt. The ratio of total current assets to total current liabilities is used to estimate the liquidity of a firm.

As trade-off theory proposes, tax advantages of debt favors the use of debt up to a limit where the bankruptcy costs exceed the advantages. Therefore, tax shield provided by

debt is supposed to be taken into account in the empirical research. However, cross-country comparison of the influence of tax advantages of debt is problematic. The tax system of countries involves several features which vary across countries considerably. Together with the changing accounting principles across countries, the previous studies utilize non debt tax shields such as depreciation as a proxy for tax shields. In this study, the *tax rate (TAX)* is calculated for each firm by the taking the average of taxes paid and dividing it with the average pre-tax profit along the period of time when the relevant data exists for the firm. This estimation comprises assumptions such as the constant effective tax rate throughout the time period, and ignores the influence of adjustments such as tax deferrals. However, for cross-country comparison, it is decided to take tax shield into account with the *TAX* variable.

In literature, the leverage is measured in various ways since the accounting rules and term structure of debt may portray distinct features of indebtedness with regard to the measure used. In most of the studies, the researchers prefer to identify the effects of the factors on both book and market value leverage which are calculated by considering long-term debt as well as the total debt. Nonetheless, some researchers suggest that market leverage may provide a more realistic measure of leverage. The accounting rules which vary across countries render the cross-country comparison of book value leverage meaningless. Therefore, the market value is closer to the firm value than the book value is. Moreover, total debt comprises short-term debt which consists largely of trade credit. Since trade credit is under the influence of completely different determinants by nature, the examination of total debt ratio is likely to generate results which are difficult to interpret. Hence, *market value long term debt ratio (MVLTD)* which is calculated by dividing long term debt by market value of total assets of the firms has been determined as the dependent variable.

5.2.Industry Effects

It is known that firms operating in capital intensive manufacturing industries are characterized by high leverage, whereas the ones operating in high tech industries are

known to have less leverage. In this study, it is aimed to identify whether the firms in the same industry have similar leverage levels independent of the country they operate. *Datastream* classifies the firms according to FTSE's Industry Classification Benchmark (ICB). ICB classification is composed of various sublevels which are tabulated in Appendix A. *The Level 4* named as sector level is utilized in this study since the broad classification of the upper levels may generate misleading results.

Financial sector and utility services are regulated by rules which may impose restrictions on the financial decisions of the firms. Moreover, the liabilities of the firms in financial sector such as banks have distinct characteristics which make comparison with other sectors irrelevant. Therefore, the firms operating in both sectors are excluded from the sample.

5.3.Country-specific determinants

In previous studies, it has been demonstrated that financial decisions of firms are significantly influenced by the macroeconomic, financial and legal conditions prevailing in the country the firms operate. In this study the country-specific factors are identified under three headings:

1. Financial sector development
2. Macroeconomic conditions
3. Business environment

5.3.1.Financial sector development

It is supposed that the characteristics of financial markets in a country may influence the investment and financing decisions of firms. In previous studies, it is predicted that the capital structure of firms is significantly related with the maturity of the capital markets and banking sector. Regarding the attributes of the financial sector which are supposed to impact leverage decisions of firms, 7 variables have been used in the analysis. Three of these variables, *bank concentration, bank return on assets,* and *stock*

market capitalization to GDP are extracted from *Financial Development and Structure Dataset* developed by Thorsten Beck, Asli Demirguc-Kunt, Ross Eric Levine, Martin Cihak and Erik H.B. Feyen and available at World Bank web site. The other variables, *bank capital to assets ratio, real interest rate, credit depth of information index,* and *strength of legal rights index* are obtained from *World Development Indicators* database of World Bank.

Bank concentration (BC) is the total assets of three largest banks as a share of assets of all commercial banks in a country. This variable is used to measure the diffusion and availability of banking services. It is predicted that the concentration of banking services may reduce the operational costs. Reduced costs help decrease the interest rates on loans and hence favor debt usage. On the contrary, the concentration of bank services in few banks may reduce the availability of services in developing countries particularly. As a result, the leverage of firms may decline in those countries where the banking sector is more concentrated.

Bank return on assets (BROA) is the net income over total assets. This variable is used to measure the average profitability of the banking sector in a country. Increasing profitability of banks imply that debt financing will be more expensive for the firms. Therefore, it is predicted that bank return on assets may have negative impact on leverage.

Stock market capitalization to GDP (SMC) is the variable used to measure the breadth of the equity market of a country. It is predicted that the firms will tend to resort to equity financing in a country where the equity market has significant volume. It is calculated by dividing the value of listed shares by GDP, where the value of each share is the average value for the year deflated by the CPI (Consumer Price Index).

Bank capital to assets ratio (BCA) is the ratio of bank capital and reserves to total assets. Capital and reserves include funds contributed by owners, retained earnings, general and special reserves, provisions, and valuation adjustments. Capital includes tier 1 capital (paid-up shares and common stock), which is a common feature in all countries' banking systems, and total regulatory capital, which includes several specified types of subordinated debt instruments that need not be repaid if the funds are required to maintain minimum capital levels (these comprise tier 2 and tier 3 capital). Total assets include all

nonfinancial and financial assets. Instead of using a variable indicating the total assets of banking sector scaled by GDP, *bank capital to assets* is preferred since it is argued that this variable demonstrates the availability and effectiveness of banking system. Total assets to GDP measures only the size of the banking sector which may not be related with the capital structure decisions of the firms. However, an increase in the bank capital to assets ratio suggests that the banks provide less credit relative to their capital, i.e. they are less eager to supply credit to the firms. The firms are supposed to resort to equity financing when banks turn out to be more conservative in providing loans. Moreover, *bank capital to assets ratio* enables to make a comparison between the equity market and banking system, indirectly. A greater ratio which indicates that the paid-up shares and common stock is great in comparison with the loans provided also implies that the equity market is well-developed.

Real interest rate (RIR) is the lending interest rate adjusted for inflation as measured by the GDP deflator. It is predicted that when the real interest rate increases in a country, the firms tend to use less leverage due to the increasing cost of debt financing.

Credit depth of information index (CDII) measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 6, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. The index measures how well a credit registry system is established in a country in order to assess the creditworthiness of borrowers. A higher index for a country suggests that the asymmetry of information and the related costs are reduced for the banking sector. Accordingly, the cost of borrowing becomes less, and the firms tend to use more leverage.

Strength of legal rights index (SLRI) measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit. The higher the index is in a country, the more leverage the firms utilize.

5.3.2.Macroeconomic conditions

It is difficult to claim that any decision of firms related to finance is independent of the macroeconomic condition in a country. Therefore, three variables, *GDP per capita growth*, *inflation rate*, and *cash surplus/deficit to GDP ratio* which are presumed to impact the leverage decisions of firms are comprised in this research.

GDP per capita growth (GDP) is the annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Since a positive *GDP per capita growth* implies an expanding economy, it is predicted that when *GDP per capita growth* increases, the country risk is mitigated, thus firms tend to use more leverage.

Inflation rate (INF), as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Debt contracts are generally nominal contracts. Therefore, high inflation results in high uncertainty in the debt contracts, thus deters lenders from providing long-term debt. Consequently, the inflation rate is assumed to have negative impact on leverage of firms.

Cash surplus/deficit (CSD) is revenue (including grants) minus expense, minus net acquisition of nonfinancial assets. In this research, the ratio of *Cash surplus/deficit to GDP* is used as a measure of the debt requirement of a country. When a country has cash deficit, it issues debt. If it issues too much debt due to its high deficit, it may dominate the debt markets, thus prevent the firms from incurring debt at suitable conditions. Therefore, it is argued that decreasing *Cash surplus/deficit to GDP* may cause the leverage of firms in general to decline.

5.3.3.Business environment

The business environment of the country shaped by the rules and their enforcement is supposed to alter the financing decisions of the firms. Under this heading two variables related with the transparency of operations and bankruptcy code are included in this study.

As regard to transparency, *business extent of disclosure index (BEDI)* developed by the World Bank is used in this research. This index measures the extent to which investors are protected through disclosure of ownership and financial information. The index ranges from 0 to 10, with higher values indicating more disclosure. It is predicted that the investors tend to invest in equity in a country with a high *business extent of disclosure index.* Accordingly, increasing demand for the equity will encourage the firms to issue equity, and hence reduce leverage.

In previous research, it has been demonstrated that the legislation related to bankruptcy has influence on the debt usage of firms. *Time to resolve insolvency (TRI),* which is the number of years from the filing for insolvency in court until the resolution of distressed assets, is employed in this research to reflect the effect of the bankruptcy costs on leverage. Increasing *Time to resolve insolvency* implies that bankruptcy costs are high, and bankruptcy code in effect is not well-functioning. Therefore, in a country with high *Time to resolve insolvency*, low level of leverage is expected since the advantages of debt financing are eliminated.

5.4.The sample

The main objective in this study is the cross-country comparison of firms' financing decisions. Therefore, the countries with distinct macroeconomic conditions, financial market development, and legal system are selected. In addition, since it is aimed to test whether geographical proximity of countries has significant effect on the leverage of firms, the countries from different continents are included in the sample. The countries selected in

this study are grouped in accordance with the geopolitical regional classification of United Nations as below:

1. US & Western Europe: United Kingdom (GBR), United States of America (USA), France (FRA), Germany (DEU)
2. Asia-Pacific: Japan (JPN), Malaysia (MYS), Indonesia (IDN)
3. Latin America: Brazil (BRA), Mexico (MEX), Chile (CHL)
4. Middle East and North Africa: Turkey (TUR), Saudi Arabia (SAU), Egypt (EGY), Jordan (JOR)

In selecting the countries, the existence of reliable and sufficient firm-level data is also taken into account. Especially, among the developing countries, the ones which have the highest number of firms with required data spanning longer period of time are considered.

For each country, the firm-level data is retrieved from *Datastream*. All the firms in *Datastream* are public firms which are quoted in national capital markets. *Datastream* ranks the data according to some pre-defined criteria. An equity is ranked the highest in case that it is a primary quote. If the equity is suspended, it gets the lowest rank in *Datastream*. In constituting the sample, the highly ranked firms are selected. The data for the period 1995-2012 is retrieved from the database. Unfortunately, in developing countries, since the markets are not mature, the data pertaining to earlier years does not exist. Although the firm data exists for developed countries for the whole period, the country-specific variables which are not available for earlier years constrain the period of analysis. Brief information about the firms selected from each country is presented in Table 5.1.

5.5.Method of Analysis

As discussed above briefly, a panel dataset is used in this study. A panel dataset has multiple observations on the same economic units. That is, it has both cross-sectional and

time series aspects. A panel keeps the same entities (which are firms in this study) and measures some quantity about them over time. The benefits of using panel data are given below (Baltagi, 2005)

1. Panel data helps control the heterogeneity of the entities such as individuals, firms or countries. In our case, there may be state-invariant or time-invariant variables specific to an individual firm which may influence its leverage decisions. Some of these variables are difficult to measure or hard to obtain. As an example, risk aversion of management or cultural values affecting the behavior of the employees may have impact on the investment and financing choices of firms. However, it is not possible to measure these determinants. Omission of these variables leads to bias in the resulting estimates. Panel data is able to control for these state and time-invariant variables, whereas a time-series or cross-section study cannot.
2. Panel data provide more variability, less collinearity among the variables, more degrees of freedom and more efficiency. Provided that the data is poolable, one can produce more reliable parameter estimates with the panel data which is more informative than the cross-sectional or time-series data.
3. Panel data enables to study the dynamics of adjustment better than cross-sectional data. For example, in measuring the debt ratios of the firms, cross-sectional data can estimate what proportion of the assets are financed by debt at a point in time. However, repeated cross-sections can show how this proportion changes over time. Moreover, the impact of country-specific policy changes on the debt usage of firms necessitates the use of panel data.

There are also limitations of panel data which should be taken care of in the analysis:

1. There are difficulties in collecting reliable data for selected individuals for a long-period time. In this study, the number of firms with required data for subsequent years is limited particularly for developing countries.

Table 5.1 Number of firms and the period of analysis

	GBR	USA	FRA	DEU	JPN	MYS	IDN
Number of firms (total)	104	106	88	98	96	85	81
Oil & Gas Prod.	3	6	3	0	3	2	0
Oil Equip. & Ser.	0	4	2	0	1	1	0
Altern.Energy	2	1	0	2	0	0	0
Chemicals	8	4	3	6	3	6	9
Forestry & Paper	1	2	2	0	3	1	1
Indust. Metals & Mining	0	3	2	1	5	4	6
Mining	0	2	1	0	2	0	6
Const. &Mat.	9	4	4	2	3	8	7
Aerospace &Def.	3	4	5	0	3	0	0
General Ind.	7	5	2	3	4	3	2
Electr, & Electrical Equip.	8	4	1	9	5	3	4
Industrial Eng.	3	6	3	17	5	4	1
Industrial Trans.	3	3	4	1	4	4	3
Support Services	3	3	3	3	3	4	1
Auto. & Parts	2	4	6	5	5	1	5
Beverages	4	4	3	0	3	3	2
Food Producers	8	4	4	2	4	11	8
Household Goods & Home Construction	7	3	2	5	4	5	0
Leisure Goods	2	2	6	1	4	0	1
Personal Goods	0	4	5	6	6	2	6
Tobacco	2	2	0	0	1	2	2
Health Care Equipment & Services	4	3	2	6	3	3	0
Pharmaceuticals & Biotechnology	2	4	4	2	5	1	5
Food & Drug Retailers	4	4	3	2	3	0	1
General Retailers	8	4	2	5	1	5	3
Media	3	3	6	2	3	2	2
Travel & Leisure	4	3	3	2	4	6	2
Mobile Telecom.	0	3	0	2	1	1	1
Real Estate Inv.& Ser.	0	1	1	0	0	0	0
Software & Comp.Ser.	2	4	3	11	2	1	2
Techn. Hardware & Equipment	2	3	3	3	3	2	1
Period	2000-2011	2001-2011	2000-2011	2000-2011	2000-2011	2001-2011	2001-2011
Observations	1,248	1,166	1,056	1,176	1,152	935	891

Table 5.1 Number of firms and the period of analysis (cont'd)

	BRA	MEX	CHL	TUR	SAU	EGY	JOR
Number of firms (total)	79	66	72	112	50	52	58
Oil & Gas Prod.	2	0	1	3	0	1	1
Oil Equip. & Ser.	2	0	0	0	0	0	0
Altern.Energy	1	0	0	0	0	0	0
Chemicals	4	4	4	7	7	6	4
Forestry & Paper	0	1	1	1	0	0	2
Indust. Metals & Mining	4	3	7	7	2	1	2
Mining	0	1	1	0	0	1	1
Const. &Mat.	4	9	7	23	13	13	4
Aerospace &Def.	1	0	0	0	0	0	0
General Ind.	0	4	3	4	3	0	1
Electr, & Electrical Equip.	1	0	0	2	2	1	2
Industrial Eng.	2	0	1	9	0	0	2
Industrial Trans.	5	1	6	1	1	2	4
Support Services	2	2	2	0	2	0	0
Auto. & Parts	5	1	1	8	0	1	1
Beverages	0	3	7	3	0	0	0
Food Producers	11	9	10	11	8	10	6
Household Goods & Home Construction	5	8	3	6	1	1	2
Leisure Goods	0	0	0	1	0	0	1
Personal Goods	8	1	0	12	0	4	1
Tobacco	1	0	1	0	0	1	2
Health Care Equipment & Services	4	1	3	0	0	0	2
Pharmaceuticals & Biotechnology	0	0	1	2	1	2	4
Food & Drug Retailers	2	4	4	0	1	0	0
General Retailers	6	4	2	3	5	0	4
Media	0	4	0	2	1	1	1
Travel & Leisure	0	5	5	5	3	3	7
Mobile Telecom.	1	1	0	0	0	2	0
Real Estate Inv.& Ser.	5	0	1	0	0	2	4
Software & Comp.Ser.	2	0	0	0	0	0	0
Techn. Hardware & Equipment	1	0	1	2	0	0	0
Period	2007-2011	2005-2011	2005-2011	2002-2011	2008-2011	2007-2011	2007-2011
Observations	395	462	504	1,120	200	260	290

2. There may distortions of measurement errors in panel data. In *Datastream* database, a firm which provides inconsistent data in one year within the test period is to be eliminated from the sample. This limits both the time period and the number of firms to be included in the sample.
3. In constituting the panel data, selection of entities may result in disregarding certain clusters in the analysis. Inference from such a censored data may introduce bias. In this study, the sample includes only the public firms since the data is available for those firms which are quoted in the stock markets. This creates problem in extending the results to the small firms which are not quoted in the stock markets. Nevertheless, since the goal is to make cross-country comparison, this caveat of panel data is ignored in this study.

The low explanatory power in previous research about capital structure decisions suggests that omitted variable bias may be a concern for our study. Many firm-specific characteristics such as management style, organizational cultures etc. are not observed. These characteristics which are named as *unobserved heterogeneity* can lead to bias in the estimation of the parameters in case that they are correlated with observed covariates. Since the panel data allows for handling this issue, panel data analysis is applied in this study.

There are several panel data techniques developed for various purposes. In the following sections, brief information about the panel techniques employed in this research is provided.

5.5.1.Fixed-effects vs. random-effects models

One of the two classes of panel estimator approach that are broadly applied in financial research is fixed-effects models. To see how the fixed effects model works, let us consider the following equation for a given observation (Baum, 2006):

$$y_{it} = \boldsymbol{x}_{it}\boldsymbol{\beta}_k + \boldsymbol{z_i}\boldsymbol{\delta} + u_i + \epsilon_{it} \quad (27)$$

where $\boldsymbol{x}_{it}$ is a 1×k vector of variables that vary over individual and time, $\boldsymbol{\beta}$ is the k×1 vector of coefficients on $\mathbf{x}$, $\boldsymbol{z_i}$ is a 1×p vector of time-invariant variables that vary only over individuals, $\boldsymbol{\delta}$ is the p×1 vector of coefficients on $\boldsymbol{z}$, u_i is the individual level effect, and the ϵ_{it} is the disturbance term. Fixed-effects model assumes that u_i may be correlated with some of the regressors in the model, and treats them like parameters or fixed effects. Since including a parameter for every individual is not feasible, the solution is to remove u_i from the model by a transformation that does not eliminate the coefficients of interest. In the so-called *within-transformation*, time-mean of each variable is subtracted from the values of the variables:

$$y_{it} - \overline{y_i} = (\boldsymbol{x}_{it} - \overline{\boldsymbol{x}_i})\boldsymbol{\beta}_k + (\boldsymbol{z_i} - \boldsymbol{z_i})\boldsymbol{\delta} + u_i - u_i + \epsilon_{it} - \overline{\epsilon_i} \quad (28)$$

Equation (28) can be simply depicted as follows:

$$\widetilde{y_{it}} = \widetilde{(\boldsymbol{x}_{it})}\boldsymbol{\beta}_k + \widetilde{\epsilon_{it}} \quad (29)$$

Ordinary Least Squares applied on within-transformed data produce consistent estimates of $\boldsymbol{\beta}$. Equation (29) has explanatory power only if the deviation of individual's y values around the individual's mean of y values is significantly correlated with the deviation of individual's x values around the individual's mean of x values. Since the estimations of $\boldsymbol{\beta}$ depend on the variation within the unit, the estimators are called within estimator. Equation (29) also implies that any characteristic that does not vary over time for each unit cannot be included in the model. Random-effects model (RE) solves this issue by making a strong assumption about the unobserved heterogeneity, u_i. RE predicts that u_i are uncorrelated with the other regressors in the model. That is,

$$Cov(\boldsymbol{x}_{it}, u_i) = 0, \qquad t = 1,2, \ldots, T \quad (30)$$

u_i together with ϵ_{it} constitutes the composite error term, v_{it} and parameterized as additional random disturbances. Because u_i is in the composite error in each time period, the v_{it} are serially correlated across time. This positive serial correlation in the error term can be

substantial, and, because the usual pooled OLS standard errors ignore this correlation, they will be incorrect, as will the usual test statistics (Wooldridge, 2012). Generalized Least Squares (GLS) transformation can be used to eliminate this serial correlation. The methodology requires sophisticated matrix algebra. Nevertheless, the transformation itself is simple. It begins with defining θ:

$$\theta = 1 - [\sigma_\epsilon^2/(\sigma_\epsilon^2 + T\sigma_u^2)]^{1/2} \quad (31)$$

which is between zero and one. Then, the transformation is applied to Equation (28), and Equation (32) is obtained:

$$y_{it} - \theta\overline{y_\iota} = (\boldsymbol{x}_{it} - \theta\overline{\boldsymbol{x}_\iota})\boldsymbol{\beta}_k + \epsilon_{it} - \theta\overline{\epsilon_\iota} \quad (32)$$

In the fixed effects model the time averages from the corresponding variable are subtracted, whereas the random effects transformation subtracts a fraction of that time average, where the fraction depends on the variation of the both terms of composite error, and the number of time periods, T. The GLS estimator is simply the pooled OLS estimator of Equation (32). The transformation in Equation (32) allows for explanatory variables that are constant over time. Therefore, RE model is more efficient than FE model, and allows a broader range of statistical inference. However, the RE estimator assumes that the u_i are uncorrelated with the regressors to construct a more efficient estimator. If the regressors are correlated with the u_i, they are correlated with the composite error term and the RE estimator is inconsistent. The Hausman test enables to test the null hypothesis that the orthogonality conditions imposed by RE estimator are valid. In Hausman test framework, both FE and RE models are fitted, and the common coefficient estimates are compared in a probabilistic sense. If the regressors are correlated with the $u_{i,}$ the FE estimator is consistent whereas the RE estimator is not. However, if there is no correlation between $u_{i,}$ and the regressors the FE estimator is still consistent, but inefficient. On the other hand, the RE estimator is both consistent and efficient. Hausman test utilizes the fact that if the

orthogonality assumption is violated, the RE estimates will significantly differ from the FE estimates.

In this research, there are variables that are constant in the test period. These variables are both firm-specific (e.g. *industry*) and country-specific (e.g. *business extent of disclosure index*). In the analysis of each country separately, these constant variables may be included in the model by employing RE model. As explained in Chapter 6, the Hausman test is applied, and the orthogonality assumption is rejected. That is, there is correlation between the unobserved heterogeneity and the variables of interest. Therefore, in the analysis of each country separately the following model is estimated with FE transformation by ignoring the variables that are constant in time:

$$MVLTD_{it} = \beta_0 + \beta_1 TANG_{it} + \beta_2 SIZE_{it} + \beta_3 GROWOPP_{it} + \beta_4 PROF_{it} + \beta_5 LIQ_{it} + \beta_6 BC_{it} + \beta_7 BROA_{it} + \beta_8 SMC_{it} + \beta_9 BCAR_{it} + \beta_{10} RIR_{it} + \beta_{11} GDP_{it} + \beta_{12} INF_{it} + \beta_{13} CSD_{it} + \epsilon_{it} \quad (33)$$

There is very high correlation between the financial sector development (BC, BROA, SMC, BCAR, RIR) and macroeconomic conditions (GDP, INF, CSD) variables. Including all of them in the model simultaneously brings about insignificant estimates, and makes inference difficult. Therefore, two regression equations, one for each group have been constructed and analysis is done for financial sector development and macroeconomic conditions separately for each country.

Although the FE transformation generates statistically meaningful results for the country-specific factors, it should be concerned that the variation of these variables around the means is the same for every firm in a country. Therefore, in order to increase the variation, hence the explanatory power of these variables, the data of the countries are pooled, and re-analyzed. In the analysis, it is assumed that the coefficients of variables are the same for all countries. This seems to be a very strong assumption. However, by including as many country-specific variables as possible that may influence the leverage, it is predicted that the coefficients of the countries may converge. Additionally, if a method

of analysis which enables the constant variables to be comprised in the model can be employed, it is suggested that the coefficients may be more alike. For all these purposes the Hausman-Taylor estimator, which is explained below is applied with the pooled data.

5.5.2.Hausman-Taylor's (1981) Estimator

In order to include the observed time invariant characteristics, such as demographic characteristics, which the fixed effects model excludes, Hausman and Taylor (1981) suggest the model below:

$$Y_{it} = \boldsymbol{X}_{1it}'\boldsymbol{\beta}_1 + \boldsymbol{X}_{2it}'\boldsymbol{\beta}_2 + \boldsymbol{Z}_{1i}'\boldsymbol{\alpha}_1 + \boldsymbol{Z}_{2i}'\alpha_2 + u_i + \epsilon_{it} \quad (34)$$

In this formulation, all individual effects denoted by $\boldsymbol{Z_i}$ are observed. Unobserved individual effects are contained in the random term, u_i . Hausman and Taylor define four sets of observed variables in the model (Greene, 2011):

- $\mathbf{X}_{1it}$ is K_1 variables that are time varying and uncorrelated with u_i ,
- $\mathbf{Z}_{1i}$ is L_1 variables that are time-invariant and uncorrelated with u_i ,
- $\mathbf{X}_{2it}$ is K_2 variables that are time varying and are correlated with u_i ,
- $\mathbf{Z}_{2i}$ is L_2 variables that are time-invariant and are correlated with u_i .

Hausman and Taylor (1981) assume that sets of variables $\mathbf{X}_1$ and $\mathbf{Z}_1$ are uncorrelated with u_i, whereas $\mathbf{X}_2$ and $\mathbf{Z}_2$ are correlated. Hausman and Taylor have proposed an instrumental variables estimator that uses only the information within the model. Hausman and Taylor show that the group mean deviations can be used as (K_1 + K_2) instrumental variables for estimation of (β, α). Since $\mathbf{Z}_1$ is uncorrelated with the disturbances, it can serve as a set of L_1 instrumental variables. That means L_2 instrumental variables are needed. The authors show that the group means for $\mathbf{X}_1$ can be used as these remaining instruments, and the model is identified provided that K_1 is greater than or equal to L_2. The step by step estimation is given in Appendix B.

The model for the pooled data in this research which is estimated by the Hausman and Taylor (1981) methodology is given in Equation (35).

$$MVLTD_{it} = \beta_0 + \beta_1 TANG_{it} + \beta_2 SIZE_{it} + \beta_3 GROWOPP_{it} + \beta_4 PROF_{it} + \beta_5 LIQ_{it} + \beta_6 BC_{it} + \beta_7 BROA_{it} + \beta_8 SMC_{it} + \beta_9 BCAR_{it} + \beta_{10} RIR_{it} + \beta_{11} GDP_{it} + \beta_{12} INF_{it} + \beta_{13} CSD_{it} + \beta_{14} CDII_{it} + \beta_{15} SLRI_{it} + \beta_{16} BEDI_{it} + \beta_{17} TRI_{it} + \beta_{18} TAX_{it} + \epsilon_{it} \quad (35)$$

Equation (35) is obtained by adding the constant variables to Equation (33). In addition, 30 dummy variables are included in the model in order to measure the differences between the debt ratios of 31 industry groups. The software package used in this research, STATA 12.0 has built-in command for Hausman and Taylor (HE) estimation. The command requires the identification of the subset of the variables that are potentially correlated with u_i. It is suggested that the unobserved heterogeneity which may affect the leverage decisions of firms may also affect the firm specific independent variables in our model. Therefore, in applying Hausman and Taylor (HE) estimation, the variables *TANG*, *SIZE*, *GROWOPP*, *PROF* and *LIQ* are presumed to be correlated with u_i.

CHAPTER 6

RESULTS

Using the software package STATA 12.0, the panel data is analyzed by the estimation methods explained in Chapter 5. Though the main objective of the thesis is to make cross-country comparison of firm's leverage decisions, in the beginning of the analysis, each country is analyzed separately. Then, the data of all countries are pooled, and the analysis is done on the pooled data.

Before presenting the regression results, general descriptive information about the variables is given for each country. The mean values of the variables are compared among the countries in order to identify whether there is a general tendency of the firms in using leverage. Afterwards, the regression results for the country-specific and pooled data are given in separate sections.

6.1.Summary statistics

The summary statistics of firm-specific variables are given in Table 6.1 for each country. Table 6.2 summarizes the country-specific variables related to the financial sector development, macroeconomic conditions and the business environment of the countries.

The mean long-term debt ratios of the countries vary between 5 and 15 percent. The highest leverage is observed in USA, Mexico, Brazil, Japan and Indonesia in descending order. The lowest average long-term debt ratio belongs to Jordan, Egypt and Turkey in ascending order. When the mean tangibility of firms is considered, Saudi Arabia, Egypt and Turkey with the low leverage ratios seem to have the firms with more tangible assets.

Similarly, USA and Brazil which have high level of leverage are at the lower tiers as to tangibility ratio. However, Mexico which is second highest country with respect to leverage holds the third place with its average tangibility.

When the average size of the firms and the average debt ratios are concerned, it can be argued that as the size increases, the leverage also increases. Jordan, Turkey and Egypt which have the lowest debt ratios also remain at the lowest levels when sequenced according to the average size of the firms. Likewise, USA, Mexico, Japan, and Indonesia holding the highest levels with their debt ratios have the greatest size of firms in their sample.

It is hard to identify a general direction of correlation between the mean debt ratios and mean growth opportunities. When the countries are ranked according to the mean growth opportunities, Saudi Arabia and Egypt with the low debt levels hold the upper tiers with Brazil and USA which have high debt ratios. When the countries with the lowest growth opportunities are taken into consideration, it is seen that Turkey with its low debt ratio shares the lower levels with Mexico and Japan which have high leverage.

Similar to the growth opportunities, ranking according to the profitability does not demonstrate a general tendency in parallel with the debt ratios. Both high leverage (Indonesia, Mexico and USA) and low leverage (Egypt, Saudi Arabia) countries constitute the 5 countries having firms of highest profitability.

However, when the countries are put in order with respect to the average liquidity, it is obvious that as long as liquidity increases, the leverage decreases. The countries with firms using less leverage such as Jordan, Saudi Arabia, Egypt and Turkey hold the 3rd, 4th, 5th and 6th place sequentially when ranked according to the liquidity. On the other hand, USA and Japan having more leverage remain at the lowest levels with respect to their average liquidity level.

Table 6.1 Summary statistics of firm-specific variables

	MVLTD					TANG					SIZE				
COUNTRY	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
GBR	1248	0,1150	0,1122	0,0000	0,6267	1248	0,3161	0,2128	0,0012	0,8975	1248	12,9796	2,2674	4,9767	19,4929
USA	1166	0,1494	0,1182	0,0000	0,6549	1166	0,3104	0,2040	0,0249	0,9152	1166	15,5432	1,6660	9,7541	19,8875
FRA	1056	0,1199	0,0962	0,0000	0,5261	1056	0,2321	0,1634	0,0000	0,9181	1056	14,0242	2,2113	8,9346	18,9308
DEU	1176	0,1067	0,1007	0,0000	0,5757	1176	0,2221	0,1450	0,0030	0,8609	1176	13,5846	2,2310	8,5114	18,9055
JPN	1056	0,1288	0,1109	0,0000	0,5355	1056	0,3379	0,1652	0,0090	0,7340	1056	19,3716	1,7296	14,2453	23,2084
MYS	830	0,083	0,1047	0,0000	0,6387	830	0,3870	0,2066	0,0000	0,9493	830	13,2094	1,7151	7,8660	16,5745
IDN	810	0,1276	0,1629	0,0000	0,8866	810	0,3840	0,2147	0,0002	0,9214	810	21,0230	1,8104	15,8490	25,8143
BRA	316	0,1368	0,1237	0,0000	0,5716	316	0,2966	0,2011	0,0010	0,8645	316	13,8989	1,6092	6,4907	19,1867
MEX	396	0,1420	0,1392	0,0000	0,8670	396	0,4297	0,2067	0,0038	0,7952	396	15,9058	1,5750	11,8962	20,2255
CHL	483	0,1263	0,1093	0,0000	0,5961	483	0,4565	0,2092	0,0000	0,9580	483	18,3097	2,0869	11,132	23,0413
TUR	1008	0,0787	0,1180	0,0000	0,7955	1008	0,3936	0,1894	0,0011	0,9847	1008	12,2216	1,6345	4,0775	17,2318
SAU	150	0,0876	0,1168	0,0000	0,4574	150	0,4703	0,2289	0,0006	0,8783	150	13,7093	1,4882	9,5371	18,8392
EGY	260	0,0549	0,0797	0,0000	0,4048	260	0,4009	0,2232	0,0083	0,8962	260	13,1925	1,7631	8,2993	17,3036
JOR	232	0,0544	0,0795	0,0000	0,3871	232	0,3773	0,2502	0,0021	0,9503	232	9,3748	1,7470	2,8904	14,6921

Table 6.1 Summary statistics of firm-specific variables (cont'd)

	GROWOPP					PROF				
COUNTRY	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
GBR	1248	1,2012	0,8776	0,1035	9,3022	1248	0,0808	0,1228	-1,9739	0,3937
USA	1166	1,4354	0,9093	0,2059	8,0899	1166	0,0955	0,0910	-0,4809	0,5660
FRA	1056	0,9859	0,8418	0,1664	12,6295	1056	0,0637	0,0773	-0,4758	0,3549
DEU	1176	1,1564	1,3225	0,1671	23,0783	1176	0,0637	0,1582	-1,6545	2,4547
JPN	1056	0,8381	0,3885	0,1997	3,3346	1056	0,0376	0,0559	-0,3127	0,4416
MYS	830	1,1586	1,1112	0,1358	9,0458	830	0,0800	0,1321	-1,2724	0,7483
IDN	810	1,3206	1,6131	0,0243	18,4963	810	0,1250	0,1773	-0,6554	2,8310
BRA	316	1,5038	1,5584	0,2289	21,4144	316	0,0751	0,1889	-2,3876	0,6432
MEX	396	1,0444	0,5839	0,1529	3,4803	396	0,0879	0,0821	-0,2739	0,3402
CHL	483	6,3025	40,7889	0,0539	427,2816	483	0,0380	0,7096	-13,2176	5,0456
TUR	1008	1,0783	0,9333	0,2140	13,3167	1008	0,0837	0,1349	-0,9872	1,5431
SAU	150	1,6359	1,0516	0,4523	7,3711	150	0,0841	0,0885	-0,3021	0,3184
EGY	260	1,5807	2,2536	0,0211	24,4565	260	0,1301	0,1144	-0,5003	0,4250
JOR	232	1,2823	0,9956	0,2760	6,8772	232	0,0452	0,1110	-0,5867	0,5003

Table 6.1 Summary statistics of firm-specific variables (cont'd)

	LIQ					TAX				
COUNTRY	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
GBR	1248	1,8102	1,9599	0,2276	26,0320	1248	0,2949	0,0694	0,0000	0,5025
USA	1166	1,8636	1,5912	0,1807	24,1282	1166	0,3586	0,1199	0,1797	1,2126
FRA	1056	1,4699	0,7270	0,0000	5,5071	1056	0,3402	0,0859	0,0827	0,6586
DEU	1176	2,0288	1,8313	0,1508	28,3585	1176	0,3257	0,0840	0,0663	0,5144
JPN	1056	1,4864	0,7944	0,3053	7,0820	1056	0,4558	0,1412	0,1552	1,2474
MYS	830	2,5310	2,5348	0,0352	24,4345	830	0,2354	0,0809	0,0202	0,4582
IDN	810	2,5208	3,9558	0,0799	85,4092	810	0,3284	0,2687	0,0760	2,3718
BRA	316	1,9609	1,2197	0,1875	7,3068	316	0,3436	0,3886	0,0000	3,1828
MEX	396	2,0566	1,3905	0,2776	8,7264	396	0,4268	0,5919	0,1251	4,2054
CHL	483	1,9606	1,2708	0,0860	15,2608	483	0,1708	0,1128	0,0000	0,8670
TUR	1008	2,1240	2,2963	0,0652	44,0105	1008	0,7244	4,4891	0,0000	47,7086
SAU	150	2,2764	1,6319	0,0903	9,4746	150	0,0076	0,0251	0,0000	0,1272
EGY	260	2,1993	1,8611	0,2924	13,6091	260	0,1594	0,0828	0,0000	0,3568
JOR	232	2,4987	2,3895	0,1453	14,0520	232	0,1791	0,4879	0,0000	3,7959

Table 6.2 Summary statistics of country-specific variables

		BC	BROA	SMC	BCA	RIR	CDII	SLRI	GDP	INF	CSD	CORTAX	BEDI	TRI
GBR	Obs.	1248	1248	1248	1248	1248	832	832	1248	1248	1248	624	728	936
	Mean	49,412	0,711	131,628	6,375	1,324	6	10	1,286	2,187	-3,791	28,667	10	1
	Std. Dev.	12,269	0,634	20,695	1,465	2,142	0	0	2,556	1,069	3,976	1,492	0	0
	Min.	31,838	-0,049	99,421	4,400	-2,526	6	10	-5,811	0,785	-10,868	26	10	1
	Max.	65,790	2,306	179,593	9,900	5,139	6	10	3,990	4,484	3,851	30	10	1
USA	Obs.	1166	1166	1166	1060	1060	848	848	1166	1166	1166	636	742	954
	Mean	29,863	0,933	123,140	10,010	3,169	6	9	0,758	2,465	-4,578	40	7	1,5
	Std. Dev.	4,557	0,444	14,427	0,729	1,199	0	0	1,764	1,112	3,425	0	0	0
	Min.	23,064	0,102	96,915	9,000	1,556	6	9	-3,651	-0,356	-10,154	40	7	1,5
	Max.	35,406	1,384	143,184	11,100	5,257	6	9	2,842	3,839	0,467	40	7	1,5
FRA	Obs.	1056	1056	1056	1056	440	704	704	1056	1056	1056	528	616	792
	Mean	61,789	0,310	81,660	4,950	4,711	4	6,125	0,762	1,746	-3,661	33,33	10	1,9
	Std. Dev.	3,690	0,241	13,515	0,925	0,274	0	1,270	1,600	0,611	1,825	0	0	0
	Min.	55,029	-0,314	64,439	3,700	4,287	4	4	-3,644	0,088	-7,249	33,33	10	1,9
	Max.	66,646	0,673	104,664	6,800	5,048	4	7	2,973	2,814	-1,618	33,33	10	1,9
DEU	Obs.	1176	1176	1176	1176	294	784	784	1176	1176	1176	588	686	882
	Mean	73,206	0,058	47,283	4,333	9,102	6	7,5	1,389	1,593	-1,409	32,405	5	1,2
	Std. Dev.	2,415	0,249	9,437	0,210	0,936	0	0,500	2,408	0,592	1,207	4,208	0	0
	Min.	70,452	-0,369	35,474	4,000	8,150	6	7	-4,905	0,313	-3,151	29,37	5	1,2
	Max.	78,072	0,474	66,352	4,800	10,372	6	8	4,172	2,628	1,365	38,36	5	1,2

Table 6.2 Summary statistics of country-specific variables (cont'd)

		BC	BROA	SMC	BCA	RIR	CDII	SLRI	GDP	INF	CSD	CORTAX	BEDI	TRI
JPN	Obs.	1056	1056	1056	1056	1056	672	672	1056	1056	576	480	576	768
	Mean	39,993	-0,005	78,387	4,382	3,156	6	6,857	0,871	-0,298	-4,106	40,69	7	0,6
	Std. Dev.	3,527	0,397	16,641	0,632	0,417	0	0,350	2,446	0,696	2,370	0	0	0
	Min.	34,964	-0,755	54,095	3,300	2,235	6	6	-5,419	-1,347	-7,578	40,69	7	0,6
	Max.	44,959	0,500	105,950	5,300	3,846	6	7	4,740	1,373	-0,868	40,69	7	0,6
MYS	Obs.	860	860	860	860	860	602	602	860	860	860	430	516	688
	Mean	63,076	1,212	129,849	8,290	2,500	6	10	2,692	2,207	-4,297	26,2	10	2,3
	Std. Dev.	9,000	0,204	11,927	0,601	4,529	0	0	2,688	1,366	0,938	1,168	0	0
	Min.	49,120	1,014	107,059	7,400	-3,903	6	10	-3,243	0,583	-6,133	25	10	2,3
	Max.	76,211	1,772	148,355	9,400	11,782	6	10	5,580	5,441	-2,959	28	10	2,3
IDN	Obs.	810	810	810	810	810	648	648	810	810	810	486	567	729
	Mean	47,393	1,843	29,332	9,650	4,336	3,125	5,625	4,055	7,976	-0,918	28	9,429	5,056
	Std. Dev.	5,427	0,406	9,409	0,726	4,567	0,928	1,655	0,727	2,888	0,500	2,238	0,495	0,644
	Min.	42,478	1,122	14,177	8,300	-3,852	2	5	3,009	4,814	-1,744	25	9	4,5
	Max.	59,204	2,544	45,034	10,700	12,322	4	10	5,125	13,109	-0,126	30	10	6
BRA	Obs.	316	316	316	316	316	316	316	316	316	316	316	316	316
	Mean	56,793	1,570	65,347	11,075	33,994	5	3	3,656	4,806	-2,055	34	5	4
	Std. Dev.	7,497	0,620	9,458	0,249	2,712	0	0	2,945	0,736	0,853	0	0	0
	Min.	47,932	0,882	52,482	10,700	29,348	5	3	-1,217	3,637	-3,470	34	5	4
	Max.	66,301	2,558	78,854	11,300	35,921	5	3	6,587	5,663	-1,209	34	5	4

Table 6.2 Summary statistics of country-specific variables (cont'd)

		BC	BROA	SMC	BCA	RIR	CDII	SLRI	GDP	INF	CSD	CORTAX	BEDI	TRI
MEX	Obs.	396	396	396	396	396	396	396	396	396	0	330	396	396
	Mean	55,723	0,741	31,482	10,317	2,572	6	5	0,891	4,360		28,6	7,667	1,8
	Std. Dev.	5,882	0,466	4,889	1,108	1,029	0	0	3,282	0,624		0,801	0,746	0
	Min.	43,957	0,205	24,438	9,200	1,134	6	5	-5,891	3,629		28	6	1,8
	Max.	60,414	1,719	39,391	12,500	4,213	6	5	3,762	5,296		30	8	1,8
CHL	Obs.	216	504	144	433	504	504	432	504	144	504	432	504	504
	Mean	53,783	1,982	129,302	7,036	9,251	5	4	3,133	2,375	3,019	17,5	7,286	3,543
	Std. Dev.	1,268	2,494	3,028	0,211	19,143	0	0	2,249	0,969	4,111	1,119	0,452	0,841
	Min.	52,062	0,013	126,285	6,400	-4,264	5	4	-1,971	1,410	-4,228	17	7	3,2
	Max.	55,068	7,797	132,320	8,300	54,600	5	4	4,886	3,340	8,350	20	8	5,6
TUR	Obs.	1008	1008	1008	1008	1008	784	784	1008	1008	560	560	672	896
	Mean	69,102	2,464	26,514	12,733	9,422	5	4	3,711	14,955	-1,402	20	8,5	3,3
	Std. Dev.	23,827	1,172	6,986	0,884	3,283	0	0	4,240	11,809	2,705	0	0,500	0
	Min.	45,316	0,239	16,026	11,500	3,053	5	4	-5,998	6,251	-5,254	20	8	3,3
	Max.	100,000	4,570	37,182	14,400	13,521	5	4	7,878	44,964	1,903	20	9	3,3

Table 6.2 Summary statistics of country-specific variables (cont'd)

		BC	BROA	SMC	BCA	RIR	CDII	SLRI	GDP	INF	CSD	CORTAX	BEDI	TRI
SAU	Obs.	150	150	150	150	0	150	150	150	150	0	150	150	150
	Mean	54,468	1,823	77,150	11,533		6	3,667	4,127	6,760		20	8	2,8
	Std. Dev.	1,910	0,097	3,438	1,057		0	0,946	2,817	2,209		0	0	0
	Min.	51,801	1,749	74,638	10,100		6	3	0,195	5,067		20	8	2,8
	Max.	56,121	1,959	81,994	12,600		6	5	6,574	9,869		20	8	2,8
EGY	Obs.	260	260	260	260	260	260	260	260	260	260	260	260	260
	Mean	57,572	0,804	55,861	47,893	3,975	5,031	3	3,414	12,144	-7,060	20	4,8	4,2
	Std. Dev.	2,481	0,083	23,007	84,901	7,186	0,863	0	1,940	3,211	1,825	0	0,401	0
	Min.	53,233	0,747	27,482	4,800	-0,078	4	3	0,075	9,319	-10,082	20	4	4,2
	Max.	60,746	0,966	88,740	217,366	18,303	6	3	5,364	18,317	-4,558	20	5	4,2
JOR	Obs.	232	232	232	232	232	232	232	232	232	232	232	232	232
	Mean	91,991	1,354	162,346	10,975	0,300	2	2	3,494	6,163	-5,339	22,25	4	3
	Std. Dev.	2,984	0,351	34,374	0,217	5,772	0	0	2,182	5,614	2,420	4,773	0	0
	Min.	88,921	0,886	118,363	10,700	-9,044	2	2	0,090	-0,678	-8,922	14	4	3
	Max.	94,988	1,741	204,178	11,300	6,251	2	2	5,787	14,928	-2,174	25	4	3

When the countries are ranked according to the average taxes paid by their firms, a tendency in accordance with the propositions of Miller- Modigliani is observed. The countries with the firms having higher tax rates are also the ones with the highest debt ratios such as USA, Mexico, Japan and Indonesia. In the same manner, Jordan, Egypt and Saudi Arabia with firms using low leverage are ranked at the lowest levels according to their average tax rate.

The comparison of the averages of country-specific variables also provides some intuition about the impacts of them on the leverage levels of the countries. When the countries are ranked according to their bank concentration, it is observed that the countries with low leverage levels such as Jordan and Turkey have highest bank concentration. In the same manner, USA, Indonesia and Japan which have higher mean leverage are characterized with having the least bank concentration.

The ranking according to bank return on assets does not demonstrate a certain pattern in accordance with the leverage. The ROA of banks in Turkey is the highest while it is the least in Japan. This shows a negative relation between the bank ROA and leverage. However, when the whole ranking is considered, it is suggested that more sophisticated analysis is needed before making a sound judgment.

When the order of the countries with respect to their stock market capitalization to GDP ratios is compared with the order according to their leverage, a specific pattern of behavior is not observed. Two countries of low leverage hold the top and bottom of the list, simultaneously. Jordan has the highest ratio, while Turkey has the lowest.

Egypt, Turkey and Saudi Arabia have the highest bank capital to assets ratio in descending order. The countries which are characterized with sound banking system such as UK, France, Japan and Germany have the lowest bank capital to assets ratio. The ranking indicates a negative relationship between the leverage and the BCA. However, additional analysis is needed.

Brazil is ranked first, and Turkey is ranked second with respect to their average real interest rates. In the test period, it seems that high real interest rates may impact leverage decisions of firms in different aspects. When Brazil, one of the highest leverage countries is compared with Turkey of low leverage, it seems that high real interest rate brings additional funds for the borrowers in Brazil. On the contrary, high real interest rates render

borrowing more difficult for Turkish companies rather that attracting additional funds out of the country.

The ranking of the countries according to the *Credit depth of information index (CDII)* indicates that a credit registry system which is established in a country in order to assess the creditworthiness of borrowers promotes using leverage. USA, Japan and Mexico which has the highest value of the index are the countries with more levered firms. Jordan with the lowest value of CDII remains at the bottom of the list.

The descriptive statistics show that the countries with higher *Strength of legal rights index (SLRI)* have higher mean debt ratios. One outlier is Brazil which is at the lower tiers in spite of its high average debt ratio. One reason for this contradiction may be due to the public firms in Brazil whose substantial amount of equity is owned by the government. This type of firms may not concern about the enforcement of bankruptcy code since they are owned by government.

The ranking according to the GDP per capita growth demonstrates a negative correlation between the economic growth and the firms' use of leverage. The countries which have the highest GDP growth per capita such Turkey, Saudi Arabia and Jordan have low levels of leverage. On the other hand, the countries such as USA, Japan and Mexico which have high level of leverage underwent lower average economic growth in the test period.

The order of the countries with respect to the mean inflation rate is similar to the ranking with respect to economic growth. Turkey, Saudi Arabia, Jordan and Egypt which have low levels of leverage suffered from high inflation rate in the test period. Nevertheless the highest leverage countries such as USA, Mexico and Brazil are not at the lowest tier in the ranking with respect to inflation. This implies the discrepancy between these two groups of countries as regard to growth/inflation relationship.

Chile is the only country that has average cash surplus. The other countries in the sample has cash deficit in average over the test period. The highest deficit is observed in USA, Jordan and Egypt in ascending order. The data for Saudi Arabia and Mexico does not exist. The ranking of the remaining countries according to the cash surplus/deficit by itself does not present significant relationship with the leverage.

Corporate tax rate (CORTAX) is the average tax rate on the corporate income gathered and provided by KPMG in its website[2]. Despite its being an aggregate number, ranking the countries according to the corporate tax rate indicates a significant relationship with the debt ratios. The countries with the highest corporate tax rates are the ones with the highest debt ratios. Likewise, the lowest corporate tax rates are in effect in the countries with low levels of mean leverage.

Business extent of disclosure index (BEDI) measures the extent of the disclosure of ownership and financial information about firms in a country. It is expected that in the countries with higher indices, the firms may acquire equity financing more easily since the asymmetry of information is reduced. The ranking of the countries with respect to this index shows that high leverage countries are at the lower tiers as expected. However, in-depth analysis is needed in order to make a sound judgment.

The countries with high mean debt ratios such as USA, Mexico and Japan have less time necessary to resolve insolvency. In the same manner, Egypt and Turkey with low mean leverages have longer time to resolve insolvency. Brazil having high mean leverage with long resolution time does not follow this trend.

6.2.Individual analysis of countries

The individual analysis of countries is performed with both fixed effects and Hausman-Taylor model. In both models, the firm specific determinants are comprised in every analysis. However, the country-specific variables cannot be included at the same time since the high correlation among them reduces the explanatory power. Because the main objective is cross-country comparison of the impacts of certain variables on capital structure decisions, the country-specific variables are analyzed in separate groups.

In fixed effects model the first stage of analysis encompasses firm-specific variables exclusively. In the second stage, the variables related to the macroeconomic conditions are added to the base model which involves only firm specific variables. In the

[2]http://www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates- table.aspx

third stage, the variables related to the financial market development together with the firm-specific variables are used in the analysis. The variables related to the macroeconomic conditions are *GDP per capita growth (GDP), Inflation rate (INF), Cash surplus/deficit (CSD) and Real interest rate (RIR).* The financial sector development variables are *Bank concentration (BC), Bank return on assets (BROA), Stock market capitalization to GDP (SMC)* and *Bank capital to assets ratio (BCA).* The *Real interest rate (RIR)* was classified as a financial sector development variable in Chapter 5 in accordance with the World Development Indicators database. However, in the analysis, since its impact is more relevant with the macroeconomic conditions than with the financial sector development, it is analyzed with *GDP per capita growth (GDP), Inflation rate (INF),* and *Cash surplus/deficit (CSD).*

The results of fixed effects model for three stages of analysis are presented in Table 6.3, 6.4 and 6.5. Table 6.3 exhibits the significance of the firm-specific variables when no other variables are included in the model. The coefficient for tangibility is positive and significant at the 5% level for countries UK, France, Germany, Japan, Malaysia, Indonesia, Chile and Turkey, and at the 10% level for Mexico and Egypt. Specifically in Asia-Pacific region countries, the coefficients are even significant at the 1% level, and they are large in scale. The positive relationship between leverage and tangibility is expected since the collateral aspects of assets in place help to increase leverage. Contrary to the expectation, only in Jordan the effect of tangibility is negative and significant at the 10% level. In USA, tangibility is not predicted to influence leverage statistically. The coefficient for size is positive and significant for countries, UK, France, Germany, Malaysia, Mexico, and Saudi Arabia at the 5% level and for Egypt at the 10% level. However, it is negative and significant for US, Indonesia, and Brazil at the 5% level. The countries with positive sign suggest that in these countries the larger firms are more diversified, less prone to bankruptcy risk, and hence have a greater debt capacity. On the contrary, in the countries with negative sign it may be argued that the larger companies may issue equity easier since they are more transparent, and less likely to suffer from asymmetry of information problem. Both of these results and their supporting arguments conform to the findings of previous researches.

The coefficients for growth opportunities are negative for all of the countries in Table 6.3. Moreover, they are significant for all the countries at the 5% level except for Saudi Arabia, Egypt and Jordan. For Jordan, it is marginally significant at 10% level. These results support the argument of agency theory about the disciplinary role of debt. In all of the countries in the sample, the firms prefer less debt in the high growth phase in order to avoid the underinvestment risk. Though profitability is significant in less number of countries than growth opportunity is, its impact is negative as well. In UK, USA, France, Germany, Japan, Saudi Arabia, Egypt and Jordan, the coefficient of profitability is negative and significant. This creates a conflict in terms of prevailing theories of capital structure in UK, France, Germany and Japan.

While these countries have negative and significant coefficients for growth opportunities which is an evidence for the relevance of agency theory, negative coefficients for profitability support the pecking order theory which states that firms prefer retained earnings rather than debt, and external equity is the last resort. The coefficients for liquidity are not as significant as the other firm-specific variables as seen in Table 6.3. They are positive and significant in UK, USA, France, Japan, Mexico and Chile at the 5% level. It may be argued that in these countries the firms have the ability to meet the short-term obligations, and hence support a relatively higher debt ratio.

Table 6.4 indicates the fixed effects estimator of the model which includes the firm specific variables and the macroeconomic conditions. When compared with the Table 6.3, the coefficients of the firm specific variables do not exhibit substantial difference in terms of scale and significance. Only the coefficient of size in Indonesia which is significant in base model becomes insignificant when the macroeconomic condition variables are added. When the country-specific variables are considered, Table 6.4 shows that the inflation has positive and significant impact in France, Brazil at the 5% level and in Germany at the 10% level. Its effect is negative and significant only in Japan. It is argued that the escalation in inflation rate increases the riskiness of the country, and hence negatively affects the borrowing and lending. However, the individual analysis of countries does not indicate such a significant relationship. Likewise, it is hard to detect a significant relationship between cash surplus/deficit and the debt ratios of firms. There is a positive

Table 6.3 Fixed effects estimator results-base model[3]

	TANG	SIZE	GROWOPP	PROF	LIQ	CONS.	R-SQ	OBS.
GBR	0,1003	0,0381	-0,0246	-0,1348	0,0052	-0,3799	0,1775	1248
	0,0247	0,0045	0,0033	0,0184	0,0016	0,0620		
	4,0600	8,4900	-7,5000	-7,3300	3,2800	-6,1300		
USA	0,0321	-0,0310	-0,0354	-0,1685	0,0045	0,6802	0,1657	1166
	0,0352	0,0059	0,0040	0,0305	0,0021	0,0948		
	0,9100	-5,2400	-8,9100	-5,5300	2,1100	7,1700		
FRA	0,0985	0,0341	-0,0150	-0,2489	0,0322	-0,3972	0,187	1056
	0,0378	0,0052	0,0025	0,0278	0,0050	0,0763		
	2,6100	6,5000	-6,0400	-8,9400	6,4000	-5,2100		
DEU	0,0670	0,0220	-0,0087	-0,0453	0,0005	-0,1949	0,0636	1176
	0,0324	0,0046	0,0016	0,0124	0,0013	0,0640		
	2,0700	4,8100	-5,3400	-3,6500	0,3800	-3,0500		
JPN	0,2998	-0,0025	-0,0448	-0,2716	0,0097	0,1098	0,2392	1056
	0,0341	0,0058	0,0067	0,0355	0,0039	0,1161		
	8,8000	-0,4300	-6,6400	-7,6500	2,4800	0,9500		
MYS	0,2496	0,0171	-0,0140	-0,0200	0,0026	-0,2287	0,1479	830
	0,0233	0,0049	0,0050	0,0242	0,0015	0,0695		
	10,7000	3,4800	-2,7900	-0,8300	1,7400	-3,2900		
IDN	0,2670	-0,0236	-0,0152	-0,0233	0,0015	0,5408	0,1181	810
	0,0380	0,0065	0,0035	0,0265	0,0011	0,1385		
	7,0300	-3,6200	-4,3500	-0,8800	1,3200	3,9000		

[3] For each country, 1st, 2nd and 3rd rows are the coefficient, standard error and t-value respectively.

Table 6.3 Fixed effects estimator results-base model (cont'd)

	TANG	SIZE	GROWOPP	PROF	LIQ	CONS.	R-SQ	OBS.
BRA	-0,0338	-0,0198	-0,0169	-0,0328	-0,0124	0,4737	0,0807	316
	0,0547	0,0097	0,0042	0,0287	0,0068	0,1454		
	-0,6200	-2,0300	-4,0100	-1,1400	-1,8200	3,2600		
MEX	0,1330	0,0758	-0,0670	0,0738	0,0265	-1,1121	0,1565	396
	0,0691	0,0154	0,0128	0,0800	0,0068	0,2554		
	1,9200	4,9300	-5,2300	0,9200	3,9100	-4,3500		
CHL	0,2040	0,0050	-0,0006	0,0020	0,0082	-0,0701	0,1358	483
	0,0316	0,0047	0,0002	0,0052	0,0031	0,0817		
	6,4500	1,0600	-2,9000	0,3700	2,6200	-0,8600		
TUR	0,0904	0,0009	-0,0100	-0,0177	0,0009	0,0434	0,0234	1120
	0,0254	0,0044	0,0035	0,0219	0,0015	0,0578		
	3,5600	0,2000	-2,8400	-0,8100	0,6300	0,7500		
SAU	0,0662	0,0655	-0,0046	-0,3606	0,0071	-0,8198	0,2188	150
	0,0868	0,0147	0,0071	0,1288	0,0053	0,1981		
	0,7600	4,4500	-0,6400	-2,8000	1,3300	-4,1400		
EGY	0,1025	0,0150	-0,0020	-0,2274	0,0000	-0,1539	0,1129	208
	0,0617	0,0083	0,0020	0,0676	0,0031	0,1081		
	1,6600	1,8100	-1,0100	-3,3600	0,0000	-1,4200		
JOR	-0,1034	0,0081	-0,0129	-0,1124	0,0020	0,0342	0,0587	232
	0,0578	0,0088	0,0078	0,0564	0,0033	0,0893		
	-1,7900	0,9200	-1,6500	-1,9900	0,6100	0,3800		

and significant relationship in UK and USA, whereas its impact is negative in France. The coefficients for real interest rate do not exhibit a general tendency among firms, either. The impact of real interest rate is positive and significant in Japan and Chile, whereas the relationship is negative and significant in USA and Turkey. Among the macroeconomic conditions variables, GDP per capita growth is the most significant one. In UK, USA, France, Germany, Japan, Indonesia, and Turkey, GDP per capita growth has negative and significant impact on the debt ratios of the firms. In these countries, the firms reduce their debt ratios when the economy is expanding.

When the financial sector development variables are included in the model in place of the macroeconomic variables, no significant difference is observed in the size and significance of the coefficients of firm-specific variables as seen in Table 6.5. The results indicate no significant relationship between the debt ratio and the bank capital/assets ratio. In USA, relationship is negative, while the impact of the ratio is positive in Germany and Japan. Similarly, the effect of bank concentration on leverage is negative and significant only in USA and Turkey. The negative sign implies that when the total assets of banking sector in USA and Turkey are accumulated in fewer banks, the firms get difficulty in accessing loans. Bank return on assets is the most significant factor among the financial sector development variables related to banking system. In USA, France, Germany, Brazil and Chile, the coefficients for bank return on assets are negative and significant at the 5% level. The sign of the relationship indicates that the appetite for profit of banks discourage the firms from using debt. The impact is positive and significant at the 5% level only in Japan. Japanese government is known to boost its real sector growth via supporting banking system. Therefore, the profitability of banking system may increase together with the leverage of firms in Japan with the incentives provided by the government. Table 6.5 shows that the only variable related to the size of the stock market, namely stock market capitalization to GDP ratio has negative and significant impact on debt ratio in UK, France, Japan, Indonesia, and Turkey. These results are in harmony with the intuition, because as the stock market grows, the firms tend to finance their investments by issuing equity and borrow less.

Table 6.4 Fixed effects estimator results-base model & macroeconomic condition variables[4]

	TANG	SIZE	GROWOPP	PROF	LIQ	INF	CSD	GDP	RIR	CONS.	R2	OBS
GBR	0,0835	0,0415	-0,0227	-0,1296	0,0053	-0,0038	0,0037	-0,0051	-0,0031	-0,3884	0,1985	1248
	0,0263	0,0050	0,0033	0,0184	0,0016	0,0024	0,0015	0,0010	0,0025	0,0657		
	3,1800	8,2800	-6,8500	-7,0500	3,3400	-1,5600	2,5200	-5,0800	-1,2600	-5,9100		
USA	0,0133	-0,0254	-0,0351	-0,1253	0,0045	-0,0022	0,0040	-0,0059	-0,0097	0,6512	0,1894	1060
	0,0380	0,0075	0,0043	0,0314	0,0022	0,0025	0,0011	0,0014	0,0023	0,1132		
	0,3500	-3,3800	-8,2300	-3,9900	2,0700	-0,9100	3,5800	-4,2700	-4,2200	5,7500		
FRA	0,0880	0,0299	-0,0125	-0,2262	0,0314	0,0081	-0,0022	-0,0040		-0,3580	0,2049	1056
	0,0376	0,0053	0,0025	0,0282	0,0050	0,0031	0,0012	0,0013		0,0765		
	2,3400	5,6100	-4,9800	-8,0400	6,2900	2,5900	-1,9200	-3,0600		-4,6800		
DEU	0,0591	0,0220	-0,0078	-0,0408	0,0005	0,0076	-0,0007	-0,0027		-0,2046	0,0716	1176
	0,0326	0,0046	0,0017	0,0125	0,0013	0,0040	0,0017	0,0009		0,0639		
	1,8100	4,7900	-4,6400	-3,2700	0,3500	1,9200	-0,4100	-2,9700		-3,2000		
JPN	0,2651	0,0081	-0,0315	-0,2129	0,0092	-0,0128		-0,0022	0,0230	-0,1722	0,2759	1056
	0,0338	0,0060	0,0071	0,0360	0,0038	0,0023		0,0009	0,0053	0,1232		
	7,8400	1,3600	-4,4100	-5,9200	2,4000	-5,6500		-2,4700	4,3300	-1,4000		
MYS	0,2573	0,0151	-0,0125	-0,0176	0,0026	0,0024	-0,0018	-0,0020	-0,0010	-0,2120	0,1551	830
	0,0237	0,0051	0,0051	0,0242	0,0015	0,0030	0,0027	0,0018	0,0014	0,0709		
	10,8600	2,9800	-2,4700	-0,7300	1,7100	0,8100	-0,6700	-1,1300	-0,7300	-2,9900		
IDN	0,2342	0,0057	-0,0116	-0,0370	0,0020	0,0031	0,0070	-0,0283	0,0015	0,0214	0,1568	810
	0,0377	0,0083	0,0035	0,0262	0,0011	0,0019	0,0137	0,0081	0,0013	0,1750		
	6,2100	0,6900	-3,3200	-1,4100	1,8100	1,6100	0,5100	-3,5000	1,1800	0,1200		

[4] For each country, 1st, 2nd and 3rd rows are the coefficient, standard error and t-value respectively.

Table 6.4 Fixed effects estimator results-base model & macroeconomic condition variables (cont'd)

	TANG	SIZE	GROWOPP	PROF	LIQ	INF	CSD	GDP	RIR	CONS.	R2	OBS
BRA	-0,0434	-0,0396	-0,0080	-0,0231	-0,0055	0,0417		0,0009	-0,0018	0,5816	0,2500	316
	0,0498	0,0097	0,0041	0,0264	0,0063	0,0061		0,0015	0,0018	0,1759		
	-0,8700	-4,0800	-1,9700	-0,8800	-0,8700	6,8000		0,6100	-0,9900	3,3100		
MEX	0,1321	0,0749	-0,0678	0,0738	0,0264	-0,0045		-0,0015	-0,0011	-1,0725	0,1576	396
	0,0697	0,0187	0,0135	0,0863	0,0069	0,0133		0,0026	0,0054	0,3010		
	1,9000	4,0100	-5,0200	0,8600	3,8500	-0,3400		-0,5700	-0,2100	-3,5600		
CHL	0,2194	0,0024	-0,0005	0,0015	0,0089		-0,0008	-0,0013	0,0005	-0,0307	0,1686	483
	0,0316	0,0047	0,0002	0,0052	0,0031		0,0008	0,0015	0,0001	0,0811		
	6,9400	0,5200	-2,6800	0,2900	2,8700		-0,9600	-0,8800	3,2300	-0,3800		
TUR	0,1184	-0,0022	-0,0083	0,0047	0,0019	0,0001		-0,0017	-0,0019	0,0867	0,0433	1008
	0,0277	0,0056	0,0037	0,0236	0,0016	0,0003		0,0006	0,0008	0,0771		
	4,2700	-0,3900	-2,2300	0,2000	1,1900	0,2200		-2,9000	-2,3700	1,1200		
SAU	0,0869	0,0683	-0,0056	-0,3455	0,0074	0,0015		-0,0022		-0,8695	0,2375	150
	0,0914	0,0149	0,0072	0,1304	0,0054	0,0020		0,0015		0,2049		
	0,9500	4,6000	-0,7800	-2,6500	1,3700	0,7500		-1,4800		-4,2400		
EGY	0,1026	0,0138	-0,0019	-0,2398	-0,0003	-0,0001		0,0147	0,0372	-0,2120	0,1285	208
	0,0630	0,0089	0,0021	0,0716	0,0032	0,0011		0,0111	0,0307	0,1221		
	1,6300	1,5500	-0,9300	-3,3500	-0,0800	-0,0800		1,3200	1,2100	-1,7400		
JOR	-0,0958	0,0053	-0,0062	-0,0758	0,0010	-0,0036		-0,0029	-0,0040	0,0830	0,1100	232
	0,0568	0,0089	0,0080	0,0568	0,0033	0,0036		0,0022	0,0034	0,0935		
	-1,6900	0,6000	-0,7700	-1,3300	0,3100	-1,0100		-1,3100	-1,1700	0,8900		

Table 6.5 Fixed effects estimator results-base model & financial sector development variables[5]

	TANG	SIZE	GROWOPP	PROF	LIQ	BCA	BC	BROA	SMC	CONS.	R2	OBS.
GBR	0,0919	0,0395	-0,0226	-0,1275	0,0052	0,0021	-0,0003	-0,0037	-0,0002	-0,3645	0,1858	1248
	0,0264	0,0050	0,0034	0,0186	0,0016	0,0019	0,0002	0,0037	0,0001	0,0722		
	3,4800	7,8800	-6,7000	-6,8700	3,2700	1,1200	-1,3500	-1,0100	-1,9500	-5,0500		
USA	-0,0170	-0,0198	-0,0349	-0,1245	0,0044	-0,0071	-0,0030	-0,0225	-0,0001	0,7094	0,2059	1060
	0,0383	0,0075	0,0042	0,0309	0,0021	0,0035	0,0009	0,0082	0,0002	0,1154		
	-0,4400	-2,6400	-8,2900	-4,0200	2,0600	-1,9900	-3,4200	-2,7300	-0,4900	6,1500		
FRA	0,0842	0,0280	-0,0128	-0,2322	0,0319	-0,0003	-0,0002	-0,0255	-0,0003	-0,2695	0,2054	1056
	0,0379	0,0057	0,0025	0,0279	0,0050	0,0037	0,0008	0,0098	0,0001	0,0987		
	2,2200	4,9400	-5,0900	-8,3200	6,4100	-0,0900	-0,1800	-2,6100	-2,1700	-2,7300		
DEU	0,0730	0,0181	-0,0071	-0,0380	0,0008	0,0343	0,0009	-0,0192	0,0002	-0,3647	0,0919	1176
	0,0325	0,0047	0,0016	0,0124	0,0013	0,0091	0,0012	0,0093	0,0003	0,1070		
	2,2500	3,8200	-4,3300	-3,0700	0,6000	3,7800	0,7600	-2,0700	0,4500	-3,4100		
JPN	0,2701	0,0057	-0,0312	-0,2421	0,0091	0,0114	-0,0004	0,0114	-0,0011	0,0006	0,2662	1056
	0,0341	0,0063	0,0072	0,0354	0,0039	0,0059	0,0005	0,0057	0,0002	0,1218		
	7,9100	0,9100	-4,3100	-6,8400	2,3100	1,9200	-0,8200	2,0000	-4,7000	0,0100		
MYS	0,2641	0,0128	-0,0133	-0,0179	0,0024	-0,0059	0,0005	0,0009	-0,0004	-0,1073	0,1596	830
	0,0242	0,0055	0,0051	0,0241	0,0015	0,0041	0,0003	0,0132	0,0002	0,0827		
	10,9300	2,3400	-2,6000	-0,7400	1,6000	-1,4400	1,7100	0,0600	-1,8500	-1,3000		
IDN	0,2316	0,0104	-0,0104	-0,0398	0,0021	-0,0081	0,0013	0,0023	-0,0028	-0,0689	0,1688	810
	0,0374	0,0083	0,0035	0,0260	0,0011	0,0057	0,0011	0,0102	0,0007	0,2024		
	6,1900	1,2500	-2,9700	-1,5300	1,8900	-1,4300	1,1600	0,2300	-3,8900	-0,3400		

[5] For each country, 1st, 2nd and 3rd rows are the coefficient, standard error and t-value respectively.

Table 6.5 Fixed effects estimator results-base model & financial sector development variables (cont'd)

	TANG	SIZE	GROWOPP	PROF	LIQ	BCA	BC	BROA	SMC	CONS.	R2	OBS.
BRA	-0,0434	-0,0396	-0,0080	-0,0231	-0,0055		0,0007	-0,0558	0,0008	0,7248	0,2500	316
	0,0498	0,0097	0,0041	0,0264	0,0063		0,0009	0,0091	0,0008	0,1506		
	-0,8700	-4,0800	-1,9700	-0,8800	-0,8700		0,7200	-6,1500	0,9100	4,8100		
MEX	0,1442	0,0661	-0,0709	0,0779	0,0255	0,0049	-0,0008	-0,0059	0,0014	-1,0026	0,1730	396
	0,0698	0,0184	0,0135	0,0834	0,0068	0,0053	0,0007	0,0108	0,0010	0,3423		
	2,0700	3,5900	-5,2500	0,9300	3,7400	0,9200	-1,0600	-0,5500	1,4500	-2,9300		
CHL	0,2085	-0,0014	-0,0005	0,0037	0,0087	-0,0023		-0,0095		0,0657	0,1371	415
	0,0350	0,0051	0,0002	0,0057	0,0030	0,0123		0,0030		0,1229		
	5,9500	-0,2700	-2,2400	0,6500	2,8500	-0,1900		-3,1500		0,5300		
TUR	0,1224	0,0002	-0,0070	-0,0028	0,0021	-0,0013	-0,0006	-0,0025	-0,0015	0,1370	0,0442	1008
	0,0276	0,0055	0,0038	0,0231	0,0016	0,0041	0,0002	0,0028	0,0006	0,0752		
	4,4400	0,0400	-1,8600	-0,1200	1,3100	-0,3200	-3,0100	-0,8700	-2,4600	1,8200		
SAU	0,0869	0,0683	-0,0056	-0,3455	0,0074		-0,0216		-0,0120	1,2345	0,2375	150
	0,0914	0,0149	0,0072	0,1304	0,0054		0,0144		0,0080	1,3770		
	0,9500	4,6000	-0,7800	-2,6500	1,3700		-1,5000		-1,5100	0,9000		
EGY	0,1026	0,0138	-0,0019	-0,2398	-0,0003		0,0032	0,0433	0,0004	-0,3800	0,1285	208
	0,0630	0,0089	0,0021	0,0716	0,0032		0,0024	0,0423	0,0003	0,1804		
	1,6300	1,5500	-0,9300	-3,3500	-0,0800		1,3500	1,0200	1,4700	-2,1100		
JOR	-0,0958	0,0053	-0,0062	-0,0758	0,0010		0,0044	0,0726	-0,0014	-0,2327	0,1100	232
	0,0568	0,0089	0,0080	0,0568	0,0033		0,0040	0,1070	0,0011	0,3322		
	-1,6900	0,6000	-0,7700	-1,3300	0,3100		1,1100	0,6800	-1,3000	-0,7000		

Hausman-Taylor model helps include the variables that are constant over time span. After testing each country one-by-one with fixed effects model, same procedure is followed by employing Hausman-Taylor model. Similar to fixed-effects model, the analysis is done for macroeconomic conditions and financial sector development variables separately. In Hausman-Taylor the industry dummies and effective tax rate variables are incorporated into the model. The 31 industries are proxied by 30 dummy variables by omitting oil and gas production which is the base industry for comparison. As explained in Chapter 5, effective tax rate which is presumed to be time-invariant for each firm is calculated by dividing the total taxes paid in the test period by the total pre-tax income. Hausman-Taylor estimation requires the identification of the endogeneous variables before the analysis. The firm-specific variables *tangibility, size, growth opportunity, profitability,* and *liquidity* are set to be correlated with u_i, namely individual-level effect. The results of analysis are presented in Tables 6.6 and 6.7.

Tables 6.6 (a) through (c) exhibit the results for the macroeconomic conditions in each country. When the results in these tables are compared with those of Table 6.4, it is seen that the coefficients for both firm-specific and country- specific variables are similar in terms of size and significance. That is, fixed effects and Hausman-Taylor models generate almost the same coefficients which have the same level of significance for the variables comprised in both models. The similarity between the results of two models implies that the endogeneity assumption about the firm-specific variables is feasible. Moreover, Hausman-Taylor method helps analyze the impact of the tax variable and industry dummies which are eliminated in fixed effects method since they are time-invariant. The coefficient for tax rate variable is positive and significant at the 5% level in USA and at the 10% level in Mexico. In other countries, the coefficients do not indicate a significant relationship between the tax rate and debt ratios of the firms.

The coefficient for an industry dummy variable shows the difference of debt ratios between that industry and the oil and gas production, *ceteris paribus*. The coefficients of almost all industries in UK are significant with positive sign. It is inferred from the coefficients that in UK the industry of a firm is a significant determinant of its debt ratio. Similarly, France and Malaysia have mostly positive and significant coefficients for industry dummies. Nevertheless, when all of the countries are considered, the results of

individual analysis of the countries do not suggest a significant relationship between the industry of a firm and its leverage level.

When the results in Tables 6.7 (a) through (c) are compared with those given in Table 6.5, it is noticed that the Hausman-Taylor and the fixed effects models generate identical results when the macroeconomic condition variables are replaced with financial sector development variables. The results for the coefficients of tax rate and industry dummy variables do not differentiate when analyzed with financial sector development variables. The tax rate variable is again significant only in USA and Mexico when financial sector development variables are analyzed together with firm specific variables. The inclusion of financial sector development variables in the model does not make a difference as to industry dummies, either. The coefficients for industry dummies are positive and significant only in UK, France, and Malaysia in descending order.

Table 6.6 (a) Hausman-Taylor estimator results-base model & macroeconomic conditions variables-GBR|USA|FRA|DEU|JPN

	GBR			USA			FRA			DEU			JPN		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INF	-0,0038	0,0025	-1,54	-0,0022	0,0025	-0,9	0,0081	0,0032	2,56	0,0076	0,0040	1,9	-0,0128	0,0023	-5,57
CSD	0,0037	0,0015	2,5	0,0040	0,0011	3,52	-0,0022	0,0012	-1,9	-0,0007	0,0017	-0,41			
GDP	-0,0051	0,0010	-5,02	-0,0059	0,0014	-4,21	-0,0040	0,0013	-3,02	-0,0027	0,0009	-2,94	-0,0022	0,0009	-2,44
RIR	-0,0031	0,0025	-1,25	-0,0097	0,0023	-4,16							0,0230	0,0054	4,27
TANG	0,0835	0,0265	3,15	0,0133	0,0386	0,34	0,0880	0,0381	2,31	0,0591	0,0329	1,79	0,2651	0,0343	7,73
SIZE	0,0415	0,0051	8,19	-0,0254	0,0076	-3,33	0,0299	0,0054	5,53	0,0220	0,0046	4,75	0,0081	0,0061	1,34
GROWOPP	-0,0227	0,0034	-6,78	-0,0351	0,0043	-8,11	-0,0125	0,0026	-4,91	-0,0078	0,0017	-4,59	-0,0315	0,0072	-4,35
PROF	-0,1296	0,0186	-6,98	-0,1253	0,0319	-3,93	-0,2262	0,0285	-7,93	-0,0408	0,0126	-3,24	-0,2129	0,0365	-5,83
LIQ	0,0053	0,0016	3,3	0,0045	0,0022	2,04	0,0314	0,0051	6,21	0,0005	0,0014	0,34	0,0092	0,0039	2,37
TAX	0,0047	0,1461	0,03	0,1692	0,0759	2,23	-0,0887	0,1048	-0,85	0,0359	0,0921	0,39	0,0479	0,0471	1,02
OILES				0,0045	0,0543	0,08	0,1276	0,0619	2,06				0,0363	0,0680	0,53
ALTEN	0,2938	0,0841	3,5	-0,0600	0,0894	-0,67				0,1845	0,0827	2,23			
CHMCL	0,2057	0,0596	3,45	-0,0284	0,0534	-0,53	0,0751	0,0560	1,34	0,0644	0,0742	0,87	-0,0285	0,0445	-0,64
FSTPA	0,2596	0,0971	2,68	0,0649	0,0652	1	0,1015	0,0616	1,65				0,0439	0,0457	0,96
INDMT				-0,0302	0,0570	-0,53	0,0283	0,0634	0,45	0,0395	0,0963	0,41	0,0328	0,0405	0,81
MNING				-0,0784	0,0691	-1,13	0,2956	0,0815	3,63				0,0477	0,0513	0,93
CNSTM	0,1731	0,0590	2,93	-0,0324	0,0557	-0,58	0,1027	0,0505	2,03	0,1250	0,0844	1,48	-0,0103	0,0452	-0,23
AERSP	0,1628	0,0698	2,33	0,0017	0,0595	0,03	0,0200	0,0507	0,4				0,0410	0,0502	0,82
GNIND	0,2031	0,0595	3,41	0,0465	0,0506	0,92	0,1910	0,0620	3,08	0,1031	0,0798	1,29	0,0376	0,0435	0,86
ELTNC	0,1996	0,0616	3,24	-0,0108	0,0568	-0,19	0,1656	0,0778	2,13	0,1244	0,0723	1,72	0,0082	0,0401	0,2

Table 6.6 (a) Hausman-Taylor estimator results -base model & macroeconomic conditions variables-GBR|USA|FRA|DEU|JPN (cont'd)

	GBR			USA			FRA			DEU			JPN		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	0,2606	0,0745	3,5	-0,0293	0,0517	-0,57	0,0725	0,0558	1,3	0,0645	0,0697	0,93	-0,0004	0,0423	-0,01
INDTR	0,3261	0,0709	4,6	-0,0064	0,0560	-0,11	0,1534	0,0532	2,88	0,1276	0,0956	1,34	0,1015	0,0428	2,37
SUPSV	0,2500	0,0682	3,67	0,0474	0,0610	0,78	0,0284	0,0559	0,51	0,0946	0,0779	1,21	0,3048	0,0444	6,86
AUTMB	0,2011	0,0781	2,58	0,0725	0,0519	1,4	0,0578	0,0466	1,24	0,0974	0,0761	1,28	0,0047	0,0404	0,12
BEVES	0,1481	0,0655	2,26	0,0017	0,0540	0,03	0,0887	0,0562	1,58				0,0240	0,0445	0,54
FOODS	0,1743	0,0591	2,95	0,0535	0,0528	1,01	0,0827	0,0507	1,63	-0,0210	0,0833	-0,25	-0,0824	0,0443	-1,86
HHOLD	0,1548	0,0609	2,54	-0,0501	0,0599	-0,84	0,0266	0,0609	0,44	0,0944	0,0741	1,27	-0,0112	0,0424	-0,26
LEISG	0,2073	0,0782	2,65	-0,1042	0,0689	-1,51	0,0891	0,0500	1,78				-0,0155	0,0422	-0,37
PERSG				0,0232	0,0556	0,42	0,0456	0,0495	0,92	0,0486	0,0733	0,66	-0,0436	0,0411	-1,06
TOBAC	0,1815	0,0755	2,4	0,0217	0,0657	0,33							0,0174	0,0627	0,28
HCEQS	0,1919	0,0729	2,63	-0,0487	0,0594	-0,82	0,0847	0,0616	1,37	0,1096	0,0731	1,5	0,0186	0,0450	0,41
PHARM	0,0503	0,0763	0,66	0,0088	0,0540	0,16	0,0749	0,0554	1,35	0,0960	0,0840	1,14	-0,0277	0,0410	-0,68
FDRGR	0,0558	0,0650	0,86	0,0299	0,0528	0,57	0,1154	0,0533	2,17	0,0521	0,0852	0,61	0,0000	0,0454	0
GNRET	0,1460	0,0614	2,38	-0,0208	0,0550	-0,38	0,1434	0,0607	2,36	0,0865	0,0740	1,17	0,0407	0,0622	0,65
MEDIA	0,2572	0,0714	3,6	-0,0459	0,0569	-0,81	0,0664	0,0491	1,35	0,0099	0,0833	0,12	-0,0214	0,0471	-0,45
TRLES	0,3331	0,0667	5	0,1281	0,0604	2,12	0,1247	0,0534	2,34	0,0866	0,0839	1,03	0,1237	0,0436	2,84
TELMB				-0,0253	0,0572	-0,44				0,1347	0,0839	1,61	0,0664	0,0639	1,04
RLISV				-0,2715	0,1004	-2,7	0,1709	0,0793	2,16						
SFTCS	0,1743	0,0767	2,27	-0,0067	0,0535	-0,13	0,0569	0,0550	1,03	0,0431	0,0715	0,6	0,0708	0,0504	1,41
TECHD	0,2061	0,0760	2,71	-0,0273	0,0591	-0,46	0,0414	0,0560	0,74	0,0560	0,0778	0,72	0,0098	0,0441	0,22
INTERCEPT	-0,5767	0,1080	-5,34	0,5929	0,1444	4,1	-0,4086	0,1088	-3,76	-0,2946	0,0980	-3,01	-0,2148	0,1361	-1,58

Table 6.6 (b) Hausman-Taylor estimator results-base model & macroeconomic conditions variables-MYS|IDN|BRA|MEX|CHL

	MYS			IDN			BRA			MEX			CHL		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INF	0,0024	0,0031	0,8	0,0031	0,0020	1,59	0,0439	0,0062	7,07	-0,0045	0,0136	-0,33			
CSD	-0,0018	0,0027	-0,66	0,0070	0,0139	0,51							-0,0008	0,0008	-0,94
GDP	-0,0020	0,0018	-1,11	-0,0283	0,0082	-3,44	0,0007	0,0016	0,42	-0,0015	0,0027	-0,56	-0,0013	0,0015	-0,86
RIR	-0,0010	0,0014	-0,72	0,0015	0,0013	1,16	-0,0022	0,0018	-1,2	-0,0011	0,0055	-0,21	0,0005	0,0001	3,16
TANG	0,2573	0,0241	10,7	0,2342	0,0383	6,11	-0,0378	0,0502	-0,75	0,1321	0,0714	1,85	0,2187	0,0322	6,79
SIZE	0,0151	0,0052	2,93	0,0057	0,0084	0,68	-0,0404	0,0097	-4,15	0,0749	0,0192	3,91	0,0025	0,0048	0,53
GROWOPP	-0,0125	0,0051	-2,43	-0,0116	0,0036	-3,27	-0,0081	0,0041	-1,97	-0,0678	0,0139	-4,9	-0,0005	0,0002	-2,62
PROF	-0,0176	0,0246	-0,72	-0,0370	0,0266	-1,39	-0,0211	0,0266	-0,79	0,0738	0,0884	0,83	0,0015	0,0053	0,29
LIQ	0,0026	0,0015	1,69	0,0020	0,0011	1,78	-0,0045	0,0063	-0,71	0,0264	0,0070	3,76	0,0089	0,0032	2,8
TAX	0,0566	0,1094	0,52	0,0466	0,0446	1,04	-0,0086	0,0378	-0,23	0,0587	0,0307	1,91	-0,1380	0,1063	-1,3
OILES	0,1409	0,0882	1,6				0,0354	0,1224	0,29						
ALTEN							-0,0858	0,1500	-0,57						
CHMCL	0,1537	0,0597	2,57	0,0017	0,0921	0,02	0,0810	0,1045	0,77	0,2285	0,1348	1,7	0,0127	0,0919	0,14
FSTPA	0,0951	0,0916	1,04	0,4031	0,1230	3,28				0,3827	0,1664	2,3	0,0220	0,1143	0,19
INDMT	0,2047	0,0653	3,13	-0,0109	0,0940	-0,12	0,0011	0,1048	0,01	0,1018	0,1328	0,77	0,0470	0,0878	0,54
MNING				0,0113	0,0958	0,12				0,1801	0,1764	1,02	0,1513	0,1456	1,04
CNSTM	0,1743	0,0581	3	0,0312	0,0956	0,33	-0,0883	0,1065	-0,83	0,2821	0,1413	2	0,0585	0,0879	0,67
AERSP							0,0203	0,1476	0,14						
GNIND	0,1792	0,0672	2,67	0,0562	0,1057	0,53				0,1326	0,1272	1,04	0,0923	0,0944	0,98
ELTNC	0,1553	0,0693	2,24	0,0521	0,0966	0,54	-0,0598	0,1476	-0,4						

Table 6.6 (b) Hausman-Taylor estimator results - base model & macroeconomic conditions variables-MYS|IDN|BRA|MEX|CHL (cont'd)

	MYS			IDN			BRA			MEX			CHL		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	0,2026	0,0635	3,19	-0,0402	0,1282	-0,31	0,0641	0,1236	0,52				0,0337	0,1157	0,29
INDTR	0,1962	0,0622	3,15	0,0379	0,1034	0,37	0,0140	0,1021	0,14	0,7409	0,1715	4,32	0,1149	0,0891	1,29
SUPSV	0,2517	0,0646	3,9	-0,0471	0,1248	-0,38	-0,1192	0,1233	-0,97	0,2602	0,1607	1,62	0,1616	0,1074	1,5
AUTMB	0,1179	0,0870	1,35	0,1521	0,0999	1,52	-0,0665	0,1036	-0,64	0,3966	0,1679	2,36	0,0153	0,1202	0,13
BEVES	0,0879	0,0653	1,35	-0,0797	0,1063	-0,75				-0,0042	0,1286	-0,03	0,0505	0,0876	0,58
FOODS	0,1044	0,0554	1,89	0,0423	0,0976	0,43	0,0023	0,0938	0,02	0,1379	0,1332	1,04	0,0241	0,0880	0,27
HHOLD	0,1392	0,0640	2,17				-0,0374	0,1042	-0,36	0,2841	0,1459	1,95	0,0676	0,0960	0,7
LEISG															
PERSG	0,2093	0,0740	2,83	0,0674	0,0964	0,7	-0,0885	0,0988	-0,9	0,1577	0,1599	0,99			
TOBAC	0,1494	0,0745	2	-0,0454	0,1148	-0,4	-0,0879	0,1491	-0,59				-0,0659	0,1152	-0,57
HCEQS	0,1812	0,0656	2,76				-0,1659	0,1086	-1,53	0,2520	0,1825	1,38	0,0161	0,0948	0,17
PHARM	0,1058	0,0875	1,21	-0,0340	0,0961	-0,35							0,0992	0,1159	0,86
FDRGR				-0,0261	0,1200	-0,22	-0,1064	0,1218	-0,87	0,0890	0,1326	0,67	0,0631	0,0915	0,69
GNRET	0,1424	0,0601	2,37	0,0754	0,1052	0,72	-0,0686	0,0996	-0,69	0,0809	0,1310	0,62	0,1019	0,0995	1,02
MEDIA	0,2088	0,0715	2,92	0,1142	0,1051	1,09				0,2766	0,1427	1,94			
TRLES	0,1196	0,0590	2,03	-0,0393	0,1074	-0,37				0,3163	0,1434	2,21	0,0251	0,0960	0,26
TELMB	0,0643	0,0866	0,74	0,0934	0,1291	0,72	0,0597	0,1470	0,41						
RLISV							-0,1028	0,1059	-0,97						
SFTCS	0,1210	0,0885	1,37	-0,1302	0,1074	-1,21	-0,2055	0,1281	-1,6						
TECHD	0,2054	0,0717	2,86	0,0537	0,1217	0,44	-0,1574	0,1488	-1,06				0,1982	0,1164	1,7
INTERCEPT	-0,3782	0,1026	-3,69	-0,0223	0,1796	-0,12	0,6444	0,2110	3,05	-1,3065	0,3968	-3,29	-0,0649	0,1320	-0,49

Table 6.6 (c) Hausman-Taylor estimator results-base model & macroeconomic conditions variables-TUR|SAU|EGY|JOR

	TUR			SAU			EGY			JOR		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INF	0,0001	0,0003	0,25	0,0015	0,0021	0,72	-0,0001	0,0011	-0,08	-0,0036	0,0038	-0,96
CSD												
GDP	-0,0016	0,0006	-2,69	-0,0022	0,0016	-1,42	0,0147	0,0116	1,27	-0,0029	0,0023	-1,25
RIR	-0,0019	0,0008	-2,29				0,0372	0,0320	1,16	-0,0040	0,0036	-1,12
TANG	0,1191	0,0280	4,26	0,0869	0,0955	0,91	0,1026	0,0656	1,56	-0,0958	0,0596	-1,61
SIZE	-0,0021	0,0057	-0,37	0,0683	0,0155	4,41	0,0138	0,0093	1,48	0,0053	0,0093	0,57
GROWOPP	-0,0085	0,0037	-2,27	-0,0056	0,0075	-0,75	-0,0019	0,0021	-0,89	-0,0062	0,0084	-0,73
PROF	0,0072	0,0238	0,3	-0,3455	0,1361	-2,54	-0,2398	0,0746	-3,22	-0,0758	0,0596	-1,27
LIQ	0,0019	0,0016	1,14	0,0074	0,0057	1,31	-0,0003	0,0033	-0,08	0,0010	0,0034	0,3
TAX	-0,0156	0,0200	-0,78	-0,7307	0,5860	-1,25	0,0151	0,0967	0,16	-0,0088	0,0175	-0,5
OILES												
ALTEN												
CHMCL	-0,0630	0,0580	-1,09	0,0839	0,1086	0,77	0,0029	0,0497	0,06	0,1040	0,0733	1,42
FSTPA	-0,0194	0,0957	-0,2							0,2462	0,0908	2,71
INDMT	-0,0192	0,0583	-0,33	0,0532	0,1118	0,48	0,0584	0,0597	0,98	0,1342	0,0898	1,49
MNING							0,0019	0,0640	0,03	0,0664	0,1071	0,62
CNSTM	-0,0538	0,0526	-1,02	0,0091	0,1026	0,09	-0,0069	0,0485	-0,14	0,0994	0,0909	1,09
AERSP												
GNIND	-0,0708	0,0644	-1,1	0,0261	0,1054	0,25				0,1042	0,1064	0,98
ELTNC	-0,0534	0,0761	-0,7	-0,0436	0,1141	-0,38	-0,0475	0,0612	-0,78	0,1071	0,0792	1,35

Table 6.6 (c) Hausman-Taylor estimator results-base model & macroeconomic conditions variables-TUR|SAU|EGY|JOR (cont'd)

	TUR			SAU			EGY			JOR		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	-0,0468	0,0576	-0,81	0,2251	0,1413	1,59				0,0914	0,0837	1,09
INDTR	0,0211	0,0957	0,22				-0,0065	0,0804	-0,08	0,1660	0,0815	2,04
SUPSV				-0,0019	0,1113	-0,02						
AUTMB	-0,0522	0,0569	-0,92				-0,0334	0,0617	-0,54	0,0741	0,0928	0,8
BEVES	-0,0519	0,0776	-0,67									
FOODS	0,0836	0,0568	1,47	-0,0448	0,1022	-0,44	-0,0382	0,0494	-0,77	0,0781	0,0757	1,03
HHOLD	-0,0079	0,0597	-0,13	0,0766	0,1319	0,58	0,0209	0,0615	0,34	0,0894	0,0869	1,03
LEISG	0,0550	0,0943	0,58							0,2084	0,0895	2,33
PERSG	-0,0276	0,0569	-0,49				-0,0588	0,0528	-1,12	0,1079	0,0909	1,19
TOBAC							-0,0478	0,0582	-0,82	0,1192	0,0769	1,55
HCEQS										0,0687	0,0916	0,75
PHARM	-0,0452	0,0756	-0,6	-0,0623	0,1296	-0,48	-0,0259	0,0620	-0,42	0,0865	0,0804	1,08
FDRGR												
GNRET	0,0100	0,0690	0,15	-0,0187	0,1057	-0,18				0,1066	0,0810	1,32
MEDIA	-0,0034	0,0756	-0,05	-0,0589	0,1313	-0,45	-0,0765	0,0687	-1,11	0,0624	0,0944	0,66
TRLES	-0,0167	0,0647	-0,26	0,0346	0,1160	0,3	0,0232	0,0568	0,41	0,1412	0,0772	1,83
TELMB							0,1085	0,0536	2,02			
RLISV							0,0270	0,0758	0,36	0,1105	0,0863	1,28
SFTCS												
TECHD	-0,0529	0,0760	-0,7									
INTERCEPT	0,1142	0,1043	1,1	-0,8766	0,2162	-4,06	-0,2041	0,1527	-1,34	-0,0273	0,1500	-0,18

Table 6.7 (a) Hausman-Taylor estimator results-base model & financial sector development variables-GBR|USA|FRA|DEU|JPN

	GBR			USA			FRA			DEU			JPN		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
BCA	0,0021	0,0019	1,11	-0,0071	0,0036	-1,96	-0,0003	0,0037	-0,09	0,0343	0,0092	3,74	0,0114	0,0060	1,89
BC	-0,0003	0,0002	-1,33	-0,0030	0,0009	-3,37	-0,0002	0,0009	-0,18	0,0009	0,0012	0,75	-0,0004	0,0005	-0,81
BROA	-0,0037	0,0037	-1	-0,0225	0,0084	-2,69	-0,0255	0,0099	-2,58	-0,0192	0,0094	-2,05	0,0114	0,0058	1,97
SMC	-0,0002	0,0001	-1,93	-0,0001	0,0002	-0,48	-0,0003	0,0001	-2,14	0,0002	0,0003	0,44	-0,0011	0,0002	-4,63
TANG	0,0919	0,0267	3,44	-0,0170	0,0389	-0,44	0,0842	0,0385	2,19	0,0730	0,0328	2,22	0,2701	0,0346	7,8
SIZE	0,0395	0,0051	7,8	-0,0198	0,0076	-2,6	0,0280	0,0057	4,87	0,0181	0,0048	3,78	0,0057	0,0064	0,89
GROWOPP	-0,0226	0,0034	-6,63	-0,0349	0,0043	-8,17	-0,0128	0,0026	-5,02	-0,0071	0,0017	-4,28	-0,0312	0,0073	-4,25
PROF	-0,1275	0,0187	-6,8	-0,1245	0,0314	-3,96	-0,2322	0,0283	-8,2	-0,0380	0,0125	-3,04	-0,2421	0,0359	-6,75
LIQ	0,0052	0,0016	3,24	0,0044	0,0022	2,03	0,0319	0,0051	6,32	0,0008	0,0013	0,59	0,0091	0,0040	2,28
TAX	0,0158	0,1420	0,11	0,1818	0,0748	2,43	-0,0942	0,1026	-0,92	0,0395	0,0883	0,45	0,0481	0,0477	1,01
OILES				0,0159	0,0535	0,3	0,1248	0,0605	2,06				0,0255	0,0693	0,37
ALTEN	0,2841	0,0819	3,47	-0,0403	0,0881	-0,46				0,1324	0,0802	1,65			
CHMCL	0,1998	0,0581	3,44	-0,0254	0,0526	-0,48	0,0704	0,0550	1,28	0,0241	0,0697	0,35	-0,0310	0,0451	-0,69
FSTPA	0,2500	0,0944	2,65	0,0723	0,0641	1,13	0,0945	0,0606	1,56				0,0384	0,0463	0,83
INDMT				-0,0278	0,0561	-0,5	0,0218	0,0623	0,35				0,0284	0,0411	0,69
MNING				-0,0610	0,0681	-0,9	0,2878	0,0801	3,59				0,0434	0,0520	0,84
CNSTM	0,1684	0,0575	2,93	-0,0281	0,0548	-0,51	0,1037	0,0494	2,1	0,0900	0,0792	1,14	-0,0120	0,0458	-0,26
AERSP	0,1621	0,0678	2,39	0,0054	0,0586	0,09	0,0156	0,0498	0,31				0,0309	0,0512	0,6
GNIND	0,1984	0,0579	3,43	0,0444	0,0499	0,89	0,1847	0,0610	3,03	0,0690	0,0748	0,92	0,0318	0,0442	0,72
ELTNC	0,1936	0,0600	3,23	-0,0147	0,0559	-0,26	0,1581	0,0765	2,07	0,0722	0,0702	1,03	0,0065	0,0406	0,16

Table 6.7 (a) Hausman-Taylor estimator results-base model & financial sector development variables-GBR|USA|FRA|DEU|JPN (cont'd)

	GBR			USA			FRA			DEU			JPN		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	0,2538	0,0726	3,49	-0,0275	0,0509	-0,54	0,0655	0,0550	1,19	0,0196	0,0669	0,29	-0,0055	0,0430	-0,13
INDTR	0,3212	0,0689	4,66	0,0013	0,0551	0,02	0,1479	0,0524	2,82	0,0840	0,0921	0,91	0,0970	0,0434	2,24
SUPSV	0,2477	0,0663	3,73	0,0431	0,0601	0,72	0,0219	0,0552	0,4	0,0497	0,0752	0,66	0,3076	0,0450	6,84
AUTMB	0,1929	0,0761	2,54	0,0650	0,0511	1,27	0,0566	0,0455	1,24	0,0622	0,0709	0,88	0,0087	0,0409	0,21
BEVES	0,1452	0,0637	2,28	-0,0041	0,0532	-0,08	0,0813	0,0555	1,46				0,0231	0,0451	0,51
FOODS	0,1692	0,0575	2,94	0,0451	0,0520	0,87	0,0796	0,0497	1,6	-0,0638	0,0791	-0,81	-0,0872	0,0449	-1,94
HHOLD	0,1509	0,0594	2,54	-0,0473	0,0589	-0,8	0,0214	0,0598	0,36	0,0484	0,0713	0,68	-0,0155	0,0430	-0,36
LEISG	0,1996	0,0762	2,62	-0,1007	0,0678	-1,48	0,0822	0,0496	1,66	-0,0488	0,0924	-0,53	-0,0130	0,0427	-0,31
PERSG				0,0261	0,0548	0,48	0,0420	0,0486	0,86	0,0053	0,0700	0,08	-0,0501	0,0417	-1,2
TOBAC	0,1839	0,0733	2,51	0,0139	0,0648	0,22							0,0221	0,0636	0,35
HCEQS	0,1854	0,0710	2,61	-0,0477	0,0585	-0,81	0,0792	0,0606	1,31	0,0594	0,0708	0,84	0,0176	0,0456	0,39
PHARM	0,0533	0,0741	0,72	-0,0033	0,0532	-0,06	0,0670	0,0549	1,22	0,0421	0,0813	0,52	-0,0266	0,0415	-0,64
FDRGR	0,0512	0,0632	0,81	0,0149	0,0521	0,29	0,1156	0,0520	2,22	0,0218	0,0799	0,27	-0,0050	0,0460	-0,11
GNRET	0,1426	0,0597	2,39	-0,0169	0,0541	-0,31	0,1445	0,0593	2,44	0,0335	0,0724	0,46	0,0393	0,0630	0,62
MEDIA	0,2558	0,0695	3,68	-0,0475	0,0561	-0,85	0,0632	0,0481	1,31	-0,0342	0,0794	-0,43	-0,0282	0,0478	-0,59
TRLES	0,3279	0,0648	5,06	0,1507	0,0596	2,53	0,1245	0,0521	2,39	0,0456	0,0795	0,57	0,1200	0,0442	2,72
TELMB				-0,0166	0,0563	-0,29				0,0963	0,0791	1,22	0,0693	0,0647	1,07
RLISV				-0,2373	0,0991	-2,4	0,1617	0,0781	2,07						
SFTCS	0,1709	0,0747	2,29	-0,0195	0,0528	-0,37	0,0526	0,0540	0,97	-0,0087	0,0699	-0,12	0,0687	0,0510	1,35
TECHD	0,2029	0,0739	2,74	-0,0290	0,0581	-0,5	0,0359	0,0550	0,65	0,0069	0,0758	0,09	0,0112	0,0446	0,25
INTERCEPT	-0,5518	0,1107	-4,98	0,6460	0,1455	4,44	-0,3141	0,1251	-2,51	-0,4104	0,1329	-3,09	-0,0393	0,1351	-0,29

Table 6.7 (b) Hausman-Taylor estimator results-base model & financial sector development variables-MYS|IDN|BRA|MEX|CHL

	MYS			IDN			BRA			MEX			CHL		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
BCA	-0,0059	0,0041	-1,42	-0,0081	0,0058	-1,41				0,0049	0,0054	0,9	-0,0022	0,0126	-0,17
BC	0,0005	0,0003	1,68	0,0013	0,0011	1,14	0,0008	0,0009	0,87	-0,0008	0,0008	-1,03			
BROA	0,0009	0,0134	0,06	0,0023	0,0103	0,22	-0,0583	0,0092	-6,37	-0,0059	0,0111	-0,54	-0,0094	0,0031	-3,05
SMC	-0,0004	0,0002	-1,82	-0,0028	0,0007	-3,83	0,0008	0,0009	0,92	0,0014	0,0010	1,42			
TANG	0,2641	0,0245	10,76	0,2316	0,0380	6,1	-0,0378	0,0502	-0,75	0,1442	0,0715	2,02	0,2071	0,0359	5,78
SIZE	0,0128	0,0056	2,3	0,0104	0,0085	1,23	-0,0404	0,0097	-4,15	0,0661	0,0188	3,51	-0,0012	0,0052	-0,23
GROWOPP	-0,0133	0,0052	-2,56	-0,0104	0,0035	-2,93	-0,0081	0,0041	-1,97	-0,0709	0,0138	-5,12	-0,0005	0,0002	-2,19
PROF	-0,0179	0,0245	-0,73	-0,0398	0,0264	-1,51	-0,0211	0,0266	-0,79	0,0779	0,0854	0,91	0,0037	0,0058	0,63
LIQ	0,0024	0,0015	1,58	0,0021	0,0011	1,86	-0,0045	0,0063	-0,71	0,0255	0,0070	3,65	0,0086	0,0031	2,77
TAX	0,0546	0,1092	0,5	0,0475	0,0446	1,07	-0,0086	0,0378	-0,23	0,0499	0,0298	1,68	-0,1593	0,1084	-1,47
OILES	0,1397	0,0881	1,59				0,0354	0,1224	0,29						
ALTEN							-0,0858	0,1500	-0,57						
CHMCL	0,1514	0,0597	2,54	-0,0052	0,0921	-0,06	0,0810	0,1045	0,77	0,2014	0,1295	1,55	0,0099	0,0938	0,11
FSTPA	0,0800	0,0925	0,86	0,3952	0,1229	3,22				0,3467	0,1600	2,17	0,0177	0,1163	0,15
INDMT	0,2037	0,0652	3,12	-0,0199	0,0940	-0,21	0,0011	0,1048	0,01	0,0804	0,1270	0,63	0,0423	0,0896	0,47
MNING				-0,0014	0,0958	-0,01				0,1367	0,1696	0,81	0,1358	0,1589	0,85
CNSTM	0,1706	0,0581	2,94	0,0190	0,0956	0,2	-0,0883	0,1065	-0,83	0,2459	0,1364	1,8	0,0466	0,0896	0,52
AERSP							0,0203	0,1476	0,14						
GNIND	0,1729	0,0673	2,57	0,0510	0,1056	0,48				0,1116	0,1218	0,92	0,0834	0,0964	0,87
ELTNC	0,1481	0,0695	2,13	0,0445	0,0966	0,46	-0,0598	0,1476	-0,4						

Table 6.7 (b) Hausman-Taylor estimator results - base model & financial sector development variables- MYS|IDN|BRA|MEX|CHL (cont'd)

	MYS			IDN			BRA			MEX			CHL		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	0,1986	0,0636	3,13	-0,0639	0,1282	-0,5	0,0641	0,1236	0,52				0,0153	0,1180	0,13
INDTR	0,1922	0,0623	3,09	0,0293	0,1034	0,28	0,0140	0,1021	0,14	0,7019	0,1649	4,26	0,0978	0,0908	1,08
SUPSV	0,2495	0,0645	3,87	-0,0641	0,1247	-0,51	-0,1192	0,1233	-0,97	0,2133	0,1556	1,37	0,1277	0,1107	1,15
AUTMB	0,1219	0,0869	1,4	0,1340	0,0999	1,34	-0,0665	0,1036	-0,64	0,3584	0,1615	2,22	-0,0087	0,1232	-0,07
BEVES	0,0879	0,0652	1,35	-0,0886	0,1062	-0,83				-0,0160	0,1227	-0,13	0,0433	0,0894	0,48
FOODS	0,1022	0,0553	1,85	0,0250	0,0976	0,26	0,0023	0,0938	0,02	0,1060	0,1282	0,83	0,0055	0,0899	0,06
HHOLD	0,1322	0,0643	2,06				-0,0374	0,1042	-0,36	0,2471	0,1409	1,75	0,0586	0,0981	0,6
LEISG															
PERSG	0,2044	0,0740	2,76	0,0538	0,0964	0,56	-0,0885	0,0988	-0,9	0,1327	0,1526	0,87			
TOBAC	0,1532	0,0745	2,06	-0,0729	0,1149	-0,63	-0,0879	0,1491	-0,59				-0,0760	0,1173	-0,65
HCEQS	0,1768	0,0656	2,69				-0,1659	0,1086	-1,53	0,1995	0,1761	1,13	0,0107	0,0967	0,11
PHARM	0,1043	0,0873	1,19	-0,0462	0,0961	-0,48							0,1016	0,1183	0,86
FDRGR				-0,0268	0,1199	-0,22	-0,1064	0,1218	-0,87	0,0638	0,1273	0,5	0,0536	0,0932	0,58
GNRET	0,1428	0,0600	2,38	0,0574	0,1052	0,55	-0,0686	0,0996	-0,69	0,0572	0,1256	0,46	0,0973	0,1014	0,96
MEDIA	0,2054	0,0715	2,87	0,1044	0,1051	0,99				0,2433	0,1373	1,77			
TRLES	0,1190	0,0589	2,02	-0,0494	0,1073	-0,46				0,2746	0,1388	1,98	0,0135	0,0979	0,14
TELMB	0,0640	0,0865	0,74	0,0720	0,1291	0,56	0,0597	0,1470	0,41						
RLISV							-0,1028	0,1059	-0,97						
SFTCS	0,1176	0,0884	1,33	-0,1265	0,1073	-1,18	-0,2055	0,1281	-1,6						
TECHD	0,2016	0,0717	2,81	0,0440	0,1216	0,36	-0,1574	0,1488	-1,06				0,1670	0,1186	1,41
INTERCEPT	-0,2702	0,1111	-2,43	-0,1012	0,2058	-0,49	0,7781	0,1878	4,14	-1,2015	0,4340	-2,77	0,0434	0,1649	0,26

Table 6.7 (c) Hausman-Taylor estimator results-base model & financial sector development variables-TUR|SAU|EGY|JOR

	TUR			SAU			EGY			JOR		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
BCA	-0,0010	0,0041	-0,25									
BC	-0,0006	0,0002	-2,83	-0,0216	0,0150	-1,44	0,0032	0,0025	1,3	0,0044	0,0042	1,06
BROA	-0,0026	0,0029	-0,91				0,0433	0,0441	0,98	0,0726	0,1123	0,65
SMC	-0,0014	0,0006	-2,32	-0,0120	0,0083	-1,45	0,0004	0,0003	1,41	-0,0014	0,0011	-1,24
TANG	0,1227	0,0279	4,41	0,0869	0,0955	0,91	0,1026	0,0656	1,56	-0,0958	0,0596	-1,61
SIZE	0,0004	0,0055	0,07	0,0683	0,0155	4,41	0,0138	0,0093	1,48	0,0053	0,0093	0,57
GROWOPP	-0,0072	0,0038	-1,89	-0,0056	0,0075	-0,75	-0,0019	0,0021	-0,89	-0,0062	0,0084	-0,73
PROF	-0,0001	0,0233	0	-0,3455	0,1361	-2,54	-0,2398	0,0746	-3,22	-0,0758	0,0596	-1,27
LIQ	0,0021	0,0016	1,26	0,0074	0,0057	1,31	-0,0003	0,0033	-0,08	0,0010	0,0034	0,3
TAX	-0,0155	0,0199	-0,78	-0,7307	0,5860	-1,25	0,0151	0,0967	0,16	-0,0088	0,0175	-0,5
OILES												
ALTEN												
CHMCL	-0,0581	0,0579	-1	0,0839	0,1086	0,77	0,0029	0,0497	0,06	0,1040	0,0733	1,42
FSTPA	-0,0143	0,0957	-0,15							0,2462	0,0908	2,71
INDMT	-0,0128	0,0582	-0,22	0,0532	0,1118	0,48	0,0584	0,0597	0,98	0,1342	0,0898	1,49
MNING							0,0019	0,0640	0,03	0,0664	0,1071	0,62
CNSTM	-0,0480	0,0525	-0,91	0,0091	0,1026	0,09	-0,0069	0,0485	-0,14	0,0994	0,0909	1,09
AERSP												
GNIND	-0,0647	0,0643	-1,01	0,0261	0,1054	0,25				0,1042	0,1064	0,98
ELTNC	-0,0472	0,0760	-0,62	-0,0436	0,1141	-0,38	-0,0475	0,0612	-0,78	0,1071	0,0792	1,35

Table 6.7 (c) Hausman-Taylor estimator results-base model & financial sector development variables-TUR|SAU|EGY|JOR (cont'd)

	TUR			SAU			EGY			JOR		
	Coeff.	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*	*Coeff.*	*se*	*t*
INDEN	-0,0391	0,0575	-0,68							0,0914	0,0837	1,09
INDTR	0,0275	0,0956	0,29	0,2251	0,1413	1,59	-0,0065	0,0804	-0,08	0,1660	0,0815	2,04
SUPSV				-0,0019	0,1113	-0,02						
AUTMB	-0,0479	0,0568	-0,84				-0,0334	0,0617	-0,54	0,0741	0,0928	0,8
BEVES	-0,0468	0,0775	-0,6									
FOODS	0,0908	0,0566	1,6	-0,0448	0,1022	-0,44	-0,0382	0,0494	-0,77	0,0781	0,0757	1,03
HHOLD	-0,0021	0,0597	-0,03	0,0766	0,1319	0,58	0,0209	0,0615	0,34	0,0894	0,0869	1,03
LEISG	0,0551	0,0942	0,58							0,2084	0,0895	2,33
PERSG	-0,0192	0,0567	-0,34				-0,0588	0,0528	-1,12	0,1079	0,0909	1,19
TOBAC							-0,0478	0,0582	-0,82	0,1192	0,0769	1,55
HCEQS										0,0687	0,0916	0,75
PHARM	-0,0398	0,0755	-0,53	-0,0623	0,1296	-0,48	-0,0259	0,0620	-0,42	0,0865	0,0804	1,08
FDRGR												
GNRET	0,0171	0,0689	0,25	-0,0187	0,1057	-0,18				0,1066	0,0810	1,32
MEDIA	0,0011	0,0755	0,01	-0,0589	0,1313	-0,45	-0,0765	0,0687	-1,11	0,0624	0,0944	0,66
TRLES	-0,0081	0,0647	-0,13	0,0346	0,1160	0,3	0,0232	0,0568	0,41	0,1412	0,0772	1,83
TELMB							0,1085	0,0536	2,02			
RLISV							0,0270	0,0758	0,36	0,1105	0,0863	1,28
SFTCS												
TECHD	-0,0467	0,0759	-0,62									
INTERCEPT	0,1511	0,1008	1,5	1,2275	1,4475	0,85	-0,3720	0,2032	-1,83	-0,3429	0,3649	-0,94

6.3.Analysis of pooled data

In order to comprise the country-specific variables which do not exhibit sufficient variation over time as c*redit depth of information index (CDII), strength of legal rights index (SLRI), business extent of disclosure index (BEDI),* and *time to resolve insolvency (TRI),* the data of all the countries except Chile which lacks data for country-specific variables are pooled in one sample, and the analysis is conducted for the macroeconomic conditions and financial sector development variables separately. In the analysis of pooled data, the Hausman-Taylor estimator is employed by presuming that the firm-specific variables *tangibility, size, growth opportunity, profitability,* and *liquidity* are correlated with u_i, namely individual-level effect. The analysis of the pooled sample for financial sector development and macroeconomic conditions variables is repeated by adding the country and region dummies successively. In the overall analysis of the countries, the *corporate tax rate (CORTAX)* collected by KPMG which does not vary much over time is also tested instead of *tax rate (TAX)*. The *tax rate (TAX)* is an average rate calculated by using the financial data of each firm in DATASTREAM database, whereas the *corporate tax rate (CORTAX)* is an aggregate rate for the whole country. In order to test the impact of tax regime in a country as accurate as possible with the available data, both variables are tested and their impact has been compared. Tables 6.8 (a) and (b) show the results for the model involving the tax rate variable (TAX) while Tables 6.9 (a) and (b) exhibit the results of the model including corporate tax rate variable (CORTAX). The results show that the tax rate variable is not significant whether it is analyzed with the financial sector development or macroeconomic condition variables. However, KPMG's corporate tax variable is significant at the 5% level within the model involving macroeconomic conditions. It is significant at the 10% level when the financial sector development variables are considered. The reduction in significance may be due to the relatively high dependence of the financial markets' development on the tax policies of a country.

When the tax rate (TAX) is included in the model, the inflation rate has positive whereas GDP has negative significant impact on the leverage of firms. When the inflation gets higher, the profitability of the firms may decrease in real prices. The reduced retained

Table 6.8 (a) Analysis of all countries by pooling-financial sector development variables with variable *tax rate (TAX)*

Variable	***Base***			***With Country Dummies***			***With Region Dummies***		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
BCA	-0,0020	0,0009	-2,13	-0,0079	0,0014	-5,64	-0,0043	0,0011	-3,93
BC	-0,0004	0,0001	-4,2	-0,0004	0,0001	-3,29	-0,0003	0,0001	-2,57
BROA	-0,0123	0,0018	-7,01	-0,0117	0,0019	-6,13	-0,0111	0,0018	-6,3
SMC	-0,0005	0,0001	-8,41	-0,0005	0,0001	-8,29	-0,0005	0,0001	-8,46
CDII	-0,0100	0,0026	-3,76	-0,0054	0,0048	-1,11	-0,0097	0,0026	-3,68
SLRI	0,0039	0,0013	2,97	0,0021	0,0019	1,12	0,0039	0,0016	2,34
BEDI	-0,0031	0,0015	-2,1	-0,0057	0,0031	-1,85	0,0014	0,0015	0,92
TRI	-0,0072	0,0038	-1,9	0,0077	0,0099	0,78	-0,0020	0,0037	-0,55
TANG	0,1120	0,0129	8,68	0,1137	0,0133	8,52	0,1031	0,0129	7,98
SIZE	0,0053	0,0014	3,93	0,0130	0,0027	4,82	0,0025	0,0016	1,61
GROWOPP	-0,0136	0,0014	-9,96	-0,0122	0,0014	-8,7	-0,0136	0,0014	-9,93
PROF	-0,0663	0,0090	-7,35	-0,0671	0,0092	-7,29	-0,0660	0,0091	-7,27
LIQ	0,0025	0,0006	4,4	0,0027	0,0006	4,59	0,0024	0,0006	4,17
TAX	0,0012	0,0018	0,66	0,0010	0,0016	0,65	0,0010	0,0017	0,56
OILES	0,0781	0,0382	2,05	0,1058	0,0334	3,17	0,0798	0,0358	2,23
ALTEN	0,0948	0,0464	2,04	0,1414	0,0413	3,43	0,0996	0,0436	2,28
CHMCL	0,0365	0,0245	1,49	0,0856	0,0214	3,99	0,0593	0,0226	2,63
FSTPA	0,1160	0,0343	3,39	0,1753	0,0303	5,78	0,1380	0,0320	4,3
INDMT	0,0250	0,0268	0,93	0,0746	0,0233	3,2	0,0496	0,0248	2
MNING	0,0094	0,0343	0,27	0,0805	0,0305	2,64	0,0380	0,0320	1,19
CNSTM	0,0264	0,0237	1,12	0,0761	0,0208	3,65	0,0472	0,0218	2,16
AERSP	0,0423	0,0331	1,28	0,0835	0,0291	2,87	0,0511	0,0308	1,66
GNIND	0,0605	0,0268	2,26	0,1069	0,0235	4,54	0,0793	0,0248	3,2
ELTNC	0,0248	0,0266	0,94	0,0833	0,0242	3,45	0,0470	0,0248	1,9
INDEN	0,0230	0,0257	0,89	0,0766	0,0231	3,31	0,0433	0,0239	1,81
INDTR	0,1145	0,0271	4,22	0,1613	0,0239	6,75	0,1349	0,0253	5,34
SUPSV	0,0873	0,0292	3	0,1318	0,0256	5,15	0,1049	0,0271	3,87
AUTMB	0,0561	0,0262	2,14	0,0953	0,0223	4,28	0,0800	0,0240	3,33
BEVES	0,0130	0,0292	0,45	0,0547	0,0253	2,16	0,0302	0,0271	1,12
FOODS	0,0302	0,0237	1,27	0,0755	0,0208	3,64	0,0498	0,0219	2,27
HHOLD	0,0446	0,0259	1,72	0,0928	0,0233	3,98	0,0572	0,0242	2,37
LEISG	-0,0013	0,0320	-0,04	0,0532	0,0282	1,89	0,0189	0,0298	0,64
PERSG	0,0182	0,0254	0,72	0,0712	0,0226	3,15	0,0388	0,0236	1,65
TOBAC	0,0377	0,0352	1,07	0,0690	0,0301	2,29	0,0631	0,0327	1,93
HCEQS	0,0159	0,0287	0,55	0,0622	0,0257	2,42	0,0309	0,0269	1,15

Table 6.8 (a) Analysis of all countries by pooling-financial sector development variables with variable *tax rate (TAX)* (cont'd)

Variable	***Base***			***With Country Dummies***			***With Region Dummies***		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
PHARM	-0,0194	0,0279	-0,7	0,0348	0,0244	1,42	0,0066	0,0258	0,26
FDRGR	0,0099	0,0296	0,33	0,0425	0,0252	1,68	0,0250	0,0273	0,92
GNRET	0,0326	0,0257	1,27	0,0681	0,0224	3,04	0,0495	0,0238	2,08
MEDIA	0,0406	0,0282	1,44	0,0899	0,0247	3,64	0,0569	0,0261	2,18
TRLES	0,0794	0,0261	3,05	0,1303	0,0228	5,73	0,1028	0,0241	4,26
TELMB	0,0802	0,0360	2,23	0,1171	0,0307	3,81	0,1004	0,0334	3
RLISV	0,0786	0,0362	2,17	0,1216	0,0329	3,69	0,0786	0,0341	2,3
SFTCS	0,0001	0,0292	0	0,0567	0,0267	2,12	0,0151	0,0274	0,55
TECHD	0,0179	0,0310	0,58	0,0638	0,0270	2,36	0,0379	0,0288	1,31
DEU				-0,0863	0,0180	-4,78			
BRA				-0,0174	0,0279	-0,62			
IDN				-0,1662	0,0333	-5			
FRA				-0,0524	0,0208	-2,52			
UK				-0,0132	0,0190	-0,69			
JPN				-0,1409	0,0195	-7,22			
MYS				-0,0365	0,0191	-1,91			
MEX				-0,0608	0,0171	-3,56			
EGY				-0,1534	0,0339	-4,53			
SAU				-0,0392	0,0227	-1,72			
TUR				-0,0358	0,0229	-1,57			
JOR				-0,0127	0,0265	-0,48			
SA							-0,0174	0,0155	-1,12
EU							-0,0621	0,0144	-4,31
MENA							-0,0668	0,0168	-3,98
PAC							-0,0812	0,0132	-6,15
_CONS	0,1295	0,0401	3,23	0,0506	0,0677	0,75	0,1735	0,0479	3,62

Table 6.8 (b) Analysis of all countries by pooling-macroeconomic condition variables with variable *tax rate (TAX)*

Variables	***Base***			***With Country Dummies***			***With Region Dummies***		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
INF	0,0014	0,0004	3,1	0,0011	0,0005	2,39	0,0011	0,0004	2,47
GDP	-0,0024	0,0003	-8,81	-0,0022	0,0003	-7,92	-0,0022	0,0003	-8,12
CDII	-0,0092	0,0025	-3,66	-0,0066	0,0044	-1,5	-0,0044	0,0025	-1,72
SLRI	0,0026	0,0013	1,99	0,0023	0,0019	1,21	0,0032	0,0017	1,91
BEDI	-0,0057	0,0015	-3,91	-0,0021	0,0029	-0,75	-0,0013	0,0014	-0,93
TRI	-0,0122	0,0036	-3,38	0,0030	0,0098	0,3	0,0000	0,0035	0
TANG	0,1160	0,0133	8,7	0,1190	0,0135	8,82	0,1099	0,0131	8,39
SIZE	0,0164	0,0018	9,12	0,0151	0,0027	5,51	0,0081	0,0015	5,43
GROWOPP	-0,0154	0,0014	-11,14	-0,0154	0,0014	-11,04	-0,0158	0,0014	-11,51
PROF	-0,0766	0,0092	-8,3	-0,0757	0,0093	-8,14	-0,0747	0,0092	-8,11
LIQ	0,0026	0,0006	4,31	0,0027	0,0006	4,5	0,0025	0,0006	4,16
TAX	0,0014	0,0017	0,8	0,0010	0,0016	0,61	0,0010	0,0016	0,65
OILES	0,0857	0,0367	2,33	0,1129	0,0333	3,39	0,0938	0,0338	2,78
ALTEN	0,1376	0,0447	3,08	0,1502	0,0412	3,64	0,1167	0,0410	2,85
CHMCL	0,0444	0,0236	1,88	0,0902	0,0214	4,21	0,0680	0,0214	3,18
FSTPA	0,1235	0,0330	3,74	0,1804	0,0303	5,95	0,1511	0,0302	5
INDMT	0,0244	0,0259	0,94	0,0796	0,0233	3,41	0,0595	0,0234	2,54
MNING	0,0037	0,0332	0,11	0,0886	0,0304	2,91	0,0539	0,0302	1,79
CNSTM	0,0407	0,0229	1,78	0,0816	0,0208	3,92	0,0591	0,0207	2,86
AERSP	0,0544	0,0319	1,71	0,0904	0,0291	3,11	0,0659	0,0291	2,27
GNIND	0,0682	0,0259	2,64	0,1115	0,0235	4,74	0,0885	0,0234	3,77
ELTNC	0,0434	0,0256	1,69	0,0904	0,0242	3,74	0,0611	0,0234	2,61
INDEN	0,0458	0,0248	1,85	0,0829	0,0231	3,59	0,0593	0,0225	2,63
INDTR	0,1232	0,0262	4,7	0,1675	0,0239	7,02	0,1451	0,0239	6,07
SUPSV	0,0962	0,0281	3,42	0,1374	0,0256	5,37	0,1161	0,0256	4,53
AUTMB	0,0527	0,0254	2,08	0,0979	0,0222	4,4	0,0858	0,0228	3,76
BEVES	0,0154	0,0281	0,55	0,0612	0,0252	2,43	0,0408	0,0256	1,6
FOODS	0,0394	0,0229	1,72	0,0807	0,0207	3,89	0,0594	0,0208	2,86
HHOLD	0,0657	0,0250	2,62	0,0992	0,0233	4,25	0,0717	0,0228	3,14
LEISG	0,0108	0,0309	0,35	0,0601	0,0282	2,13	0,0349	0,0281	1,24
PERSG	0,0342	0,0245	1,4	0,0783	0,0226	3,47	0,0555	0,0222	2,49
TOBAC	0,0211	0,0340	0,62	0,0765	0,0301	2,55	0,0637	0,0309	2,06
HCEQS	0,0386	0,0277	1,39	0,0714	0,0257	2,78	0,0460	0,0254	1,81
PHARM	-0,0200	0,0270	-0,74	0,0420	0,0244	1,72	0,0180	0,0245	0,73
FDRGR	0,0039	0,0286	0,14	0,0452	0,0252	1,8	0,0296	0,0259	1,15

Table 6.8 (b) Analysis of all countries by pooling-macroeconomic condition variables with variable *tax rate (TAX)* (cont'd)

Variables	***Base***			***With Country Dummies***			***With Region Dummies***		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
GNRET	0,0408	0,0248	1,65	0,0738	0,0224	3,3	0,0551	0,0225	2,45
MEDIA	0,0513	0,0272	1,89	0,0956	0,0247	3,87	0,0707	0,0247	2,87
TRLES	0,0874	0,0252	3,47	0,1346	0,0227	5,92	0,1114	0,0229	4,87
TELMB	0,0677	0,0348	1,94	0,1187	0,0307	3,87	0,1063	0,0316	3,36
RLISV	0,1125	0,0353	3,19	0,1322	0,0329	4,01	0,0959	0,0322	2,98
SFTCS	0,0301	0,0281	1,07	0,0665	0,0267	2,49	0,0366	0,0258	1,42
TECHD	0,0261	0,0299	0,87	0,0693	0,0270	2,57	0,0500	0,0272	1,84
DEU				0,0062	0,0146	0,42			
BRA				0,0162	0,0284	0,57			
IDN				-0,1340	0,0343	-3,91			
FRA				0,0028	0,0189	0,15			
UK				0,0115	0,0180	0,64			
JPN				-0,0864	0,0184	-4,68			
MYS				-0,0387	0,0181	-2,14			
MEX				-0,0232	0,0163	-1,43			
EGY				-0,0689	0,0312	-2,21			
SAU				-0,0332	0,0229	-1,45			
TUR				-0,0290	0,0223	-1,3			
JOR				-0,0392	0,0263	-1,49			
SA							0,0029	0,0147	0,2
EU							-0,0064	0,0112	-0,57
MENA							-0,0490	0,0160	-3,06
PAC							-0,0634	0,0114	-5,53
_CONS	-0,0971	0,0367	-2,65	-0,1649	0,0660	-2,5	-0,0521	0,0400	-1,3

earnings due to increasing inflation may lead firms to borrowing, which is the second best source of fund according to the pecking order theory. Accordingly, when the economy is expanding, the retained earnings of firms escalate. Therefore, they use less leverage in financing their investment. The financial sector development variables are also significant as seen in Table 6.8 (a). The results exhibit that as bank capital to assets ratio increase, the debt ratios of firms decrease. As the central banks of countries increase capital requirements of banks, there is less amount of loan in favorable conditions for firms. This may lead the firms to search for other financing options. The results in Table 6.8 (a) show that increasing return on bank assets results in a reduction in the leverage of the firms. This is in compliance with the results of the individual analysis of the countries. Bank concentration variable is also significant with a negative sign in the analysis of the pooled data. It is inferred from the result that as the assets of the banking system accumulate in a fewer number of banks, the accessibility of the banking system is diminished, and hence the firms acquire less loans. The results also suggest that as the stock market enlarges, the firms prefer less leverage in their balance sheet. The overall evaluation of the financial market development variables supports the argument that the availability of the external funding resources may alter the financing decisions of firms. Although all the firm-specific variables are highly significant as well, the significance of the financial market development variables indicates that the financial decisions of firms are not independent of the financial markets.

The underlying assumption in the analysis of the pooled data is that the coefficients of the firm-specific variables are identical for all the countries. Though it is a strong assumption, it is argued that the coefficients of firm-specific variables may converge as more country-specific factors are added to the model. In addition, although the coefficients may vary among the countries, the overall analysis gives a hint about the general tendency. Tables 6.8 (a) and (b) present that all five firm-specific variables have significant influence on the debt ratios of firms. Tangibility, size and liquidity have positive impact whereas the growth opportunity and profitability has negative impact on the long term debt ratios of the firms. The results do not change dramatically between the two models with macroeconomic conditions and financial market development variables.

The pooling of data enables to incorporate three indices into the model. Although these indices do not vary much over time for any country, the coefficients generated by the Hausman-Taylor approach for all of them are significant at the 5% level. The credit depth of information index (CDII) which measures how well the creditworthiness of borrowers is monitored in a country has negative effect on leverage. When the credit history of firms are kept as precisely as possible, the firms use debt more conservatively. Likewise, business extent of disclosure index (BEDI) which indicates the transparency of stock market has negative impact on leverage. As the firms share more information about their financial position, the investors tend to invest more on equity because of the reduced asymmetry of information. The increasing demand on equity encourages firms to engage in equity financing instead of borrowing. The strength of legal rights index (SLRI) which is related with the enforcement of the bankruptcy code in a country has significant impact on leverage. The results exhibit that as the strength of legal rights index (SLRI) surges, the firms use more debt. The surge of SLRI implies that the regulations in a country are better designed to protect borrowers and lenders. The protection of legal rights of borrowers and lenders facilitates lending, and hence helps increase the debt ratios. Accordingly, time to resolve insolvency (TRI), which is the number of years from the filing for insolvency in court until the resolution of distressed assets, has negative impact on leverage. The longer period of time passing in court discourages lending, and enforces the firms to seek for funds other than loans.

The results for both models with *tax rate (TAX)* variable show that industry is a determinant of the leverage levels of firms. The number of industries with significant dummies is considerable. However, the insignificant dummies suggest that testing for industry needs more firms from diverse industries. Moreover, the coefficients of 31 industries some of which most probably have similar features may correlate among themselves, and have less significant estimates. That is, a different classification of firms may produce different results in terms of size and significance of the coefficients for dummies. Nevertheless, it can be inferred from the results that industry of the firms is a required parameter in predicting the debt ratio of a firm.

In Tables 6.8 (a) and (b), the results of the analyses with country and region dummies are also given. First, 12 country dummies for 13 countries are added to the model. Since USA is the base country, the coefficient for a dummy represents the incremental leverage of the country it stands for, *ceteris paribus*. The country dummies are included in the analysis in order to identify the significance of the unobserved country-specific determinants of leverage. With the financial sector variables, the dummies for Germany, France, Japan, Mexico and Egypt have significant coefficients. However, when the macroeconomic condition variables are analyzed, Indonesia, Japan, Malaysia, and Egypt have significant coefficients at the 5% level. The difference between two analyses may arise from the fact that the unobserved country-specific effects have correlation with the macroeconomic conditions and financial market development in different schemes. The inclusion of the country dummies reduces the explanatory power of the variables *CDII, SLRI, BEDI*, and *TRI*. The significance of these four variables decreases when the country-dummies are incorporated into the model. The region dummies have similar impact when added to the model. The significance of few of the country-specific variables is reduced when the 4 region dummies for 5 regions, namely North America or USA, South or Latin America, Western Europe, MENA, and Asia-Pacific are involved in the analysis. Nevertheless, most of the country-specific variables are still significant. When the dummies themselves are considered, among the 4 region dummies, the MENA and Asia-Pacific have significant coefficients at the 5% level for both models with macroeconomic condition and financial sector development variables. Western Europe region has significant coefficient only in the model with financial sector development variables. Contrary to the country dummies, the region dummies indicate that there are region-wide unobserved determinants other than the country-specific variables used in the models, which differentiate the leverage of the firms.

The pooled data is re-analyzed by replacing the tax rate (TAX) variable with corporate tax rate (CORTAX) variable. Unlike TAX, CORTAX is significant with a positive sign at the 5% level in the model with macroeconomic condition variables. When analyzed with financial sector development variables, CORTAX is significant at the 10% level. These results demonstrated in Tables 6.9 (a) and (b) suggest that the firms utilize more debt when the corporate tax rate increases. This result is in line with trade-off theory

which argues that firms use more debt in order to exploit the tax advantages of debt to the extent that costs of financial distress exceed the tax advantages of debt. The model of macroeconomic condition variables yields significant coefficients for inflation rate and GDP per capita growth. However, the significance of the indices is reduced when CORTAX is used. The model of the financial sector variables yields significant coefficients for the indices, but bank capital to assets ratio and bank concentration does not have significant impact anymore. The alterations in the country-specific variables may be due to their correlation with the CORTAX variable. Since CORTAX is an aggregate value for the country, it reflects some policy aspects which may correlate with the policies proxied in this research. When the coefficients for industry dummies are compared, a slight increase in the significance of the dummies is observed. When the TAX variable which is firm- specific and supposed to have close relationship with the industry is excluded from the model by using CORTAX instead, the within-variation due to TAX may be allocated to the industry dummies by the model.

When the country and region dummies are included in the model, the CORTAX variable loses significance in both models. The country-specific variables such as SLRI and TDI become insignificant in the model with financial sector development variables, whereas BCA gains its significance again. The significance of the industry dummies increase when the country and region dummies are incorporated into the model. The number of countries with significant dummies also increases when CORTAX is used in the model. With financial sector variables, Germany, Indonesia, France, Japan, Mexico, Egypt, Saudi Arabia, Turkey and Jordan have significant dummy coefficients at the 5% level. The number of significant region dummies also increase with the usage of CORTAX. With financial sector variables, Saudi Arabia has also significant coefficient at the 10% level.

Table 6.9 (a) Analysis of all countries by pooling-financial sector variables with variable *corporate tax rate (CORTAX)*

Variable	***Base***			***With Country Dummies***			***With Region Dummies***		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
CORTAX	0,0846	0,0444	1,9	0,0845	0,0562	1,5	0,0658	0,0454	1,45
BCA	0,0002	0,0011	0,21	-0,0057	0,0018	-3,21	-0,0030	0,0013	-2,24
BC	0,0000	0,0002	0,09	0,0000	0,0003	-0,12	0,0001	0,0002	0,42
BROA	-0,0135	0,0018	-7,47	-0,0125	0,0022	-5,71	-0,0115	0,0018	-6,24
SMC	-0,0005	0,0001	-9,17	-0,0006	0,0001	-8,56	-0,0005	0,0001	-9,45
CDII	-0,0084	0,0026	-3,18	-0,0068	0,0050	-1,36	-0,0086	0,0028	-3,11
SLRI	0,0041	0,0018	2,31	-0,0035	0,0037	-0,93	0,0016	0,0025	0,62
BEDI	-0,0030	0,0018	-1,68	-0,0058	0,0045	-1,29	0,0022	0,0018	1,18
TRI	-0,0075	0,0038	-1,96	0,0003	0,0111	0,03	-0,0035	0,0038	-0,92
TANG	0,1084	0,0146	7,42	0,1050	0,0151	6,97	0,0979	0,0146	6,71
SIZE	0,0045	0,0016	2,73	0,0082	0,0030	2,72	0,0006	0,0019	0,32
GROWOPP	-0,0128	0,0014	-9,22	-0,0118	0,0014	-8,23	-0,0129	0,0014	-9,17
PROF	-0,0557	0,0092	-6,06	-0,0557	0,0094	-5,95	-0,0552	0,0093	-5,96
LIQ	0,0028	0,0006	4,55	0,0028	0,0006	4,53	0,0026	0,0006	4,26
OILES	0,0877	0,0371	2,36	0,0977	0,0338	2,89	0,0782	0,0358	2,19
ALTEN	0,1083	0,0453	2,39	0,1297	0,0420	3,09	0,1005	0,0436	2,31
CHMCL	0,0467	0,0236	1,98	0,0771	0,0218	3,54	0,0578	0,0225	2,57
FSTPA	0,1224	0,0332	3,69	0,1598	0,0309	5,17	0,1308	0,0320	4,08
INDMT	0,0347	0,0258	1,35	0,0658	0,0237	2,78	0,0474	0,0247	1,92
MNING	0,0177	0,0331	0,54	0,0643	0,0310	2,08	0,0323	0,0320	1,01
CNSTM	0,0364	0,0229	1,59	0,0665	0,0212	3,14	0,0456	0,0218	2,1
AERSP	0,0451	0,0323	1,4	0,0631	0,0297	2,12	0,0401	0,0309	1,3
GNIND	0,0687	0,0259	2,65	0,0957	0,0240	3,99	0,0758	0,0247	3,06
ELTNC	0,0334	0,0258	1,3	0,0684	0,0248	2,76	0,0420	0,0248	1,69
INDEN	0,0281	0,0250	1,12	0,0615	0,0237	2,59	0,0354	0,0240	1,47
INDTR	0,1253	0,0262	4,78	0,1536	0,0243	6,32	0,1333	0,0253	5,28
SUPSV	0,0928	0,0282	3,29	0,1182	0,0261	4,53	0,0980	0,0271	3,62
AUTMB	0,0658	0,0251	2,62	0,0899	0,0225	3,99	0,0781	0,0240	3,26
BEVES	0,0242	0,0282	0,86	0,0479	0,0257	1,86	0,0298	0,0270	1,1
FOODS	0,0369	0,0229	1,61	0,0646	0,0211	3,06	0,0454	0,0218	2,08
HHOLD	0,0524	0,0252	2,08	0,0800	0,0239	3,34	0,0533	0,0242	2,2
LEISG	0,0063	0,0311	0,2	0,0377	0,0288	1,31	0,0113	0,0298	0,38
PERSG	0,0274	0,0246	1,11	0,0590	0,0231	2,55	0,0347	0,0236	1,47
TOBAC	0,0444	0,0340	1,31	0,0645	0,0304	2,12	0,0594	0,0326	1,83
HCEQS	0,0171	0,0279	0,61	0,0433	0,0263	1,65	0,0195	0,0269	0,72

Table 6.9 (a) Analysis of all countries by pooling-financial sector variables with variable *corporate tax rate (CORTAX)* (cont'd)

Variable	Base			With Country Dummies			With Region Dummies		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
PHARM	-0,0104	0,0269	-0,38	0,0241	0,0248	0,97	0,0022	0,0258	0,09
FDRGR	0,0180	0,0284	0,63	0,0361	0,0255	1,41	0,0231	0,0272	0,85
GNRET	0,0367	0,0248	1,48	0,0564	0,0227	2,48	0,0428	0,0237	1,81
MEDIA	0,0521	0,0273	1,91	0,0817	0,0251	3,25	0,0559	0,0261	2,15
TRLES	0,0875	0,0252	3,48	0,1214	0,0232	5,24	0,0992	0,0241	4,12
TELMB	0,0871	0,0347	2,51	0,1128	0,0310	3,64	0,0987	0,0332	2,97
RLISV	0,0825	0,0355	2,32	0,1037	0,0337	3,08	0,0705	0,0342	2,06
SFTCS	0,0053	0,0285	0,19	0,0387	0,0275	1,41	0,0063	0,0275	0,23
TECHD	0,0236	0,0301	0,78	0,0501	0,0275	1,82	0,0306	0,0288	1,06
DEU				-0,0999	0,0203	-4,92			
BRA				-0,0477	0,0343	-1,39			
IDN				-0,1383	0,0407	-3,4			
FRA				-0,0626	0,0267	-2,35			
UK				-0,0086	0,0253	-0,34			
JPN				-0,1305	0,0220	-5,93			
MYS				-0,0310	0,0259	-1,2			
MEX				-0,0795	0,0207	-3,83			
EGY				-0,1641	0,0397	-4,13			
SAU				-0,0615	0,0273	-2,25			
TUR				-0,0603	0,0284	-2,12			
JOR				-0,0776	0,0371	-2,09			
SA							-0,0337	0,0176	-1,92
EU							-0,0657	0,0158	-4,16
MENA							-0,0808	0,0201	-4,03
PAC							-0,0787	0,0145	-5,44
_CONS	0,0630	0,0489	1,29	0,1477	0,0754	1,96	0,1745	0,0598	2,92

Table 6.9 (b) Analysis of all countries by pooling-macroeconomic condition variables with variable *corporate tax rate (CORTAX)*

Variable	Base			With Country Dummies			With Region Dummies		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
CORTAX	0,1016	0,0414	2,45	-0,0397	0,0519	-0,77	-0,0098	0,0440	-0,22
INF	0,0009	0,0004	2,19	0,0012	0,0005	2,61	0,0011	0,0004	2,55
GDP	-0,0024	0,0003	-8,51	-0,0021	0,0003	-7,24	-0,0021	0,0003	-7,42
CDII	-0,0014	0,0024	-0,57	-0,0052	0,0046	-1,12	-0,0028	0,0026	-1,07
SLRI	0,0023	0,0017	1,36	0,0016	0,0036	0,44	0,0012	0,0025	0,48
BEDI	-0,0022	0,0017	-1,28	-0,0036	0,0042	-0,85	-0,0015	0,0017	-0,87
TRI	-0,0035	0,0035	-1,01	-0,0017	0,0109	-0,16	-0,0014	0,0036	-0,4
TANG	0,0940	0,0148	6,35	0,1135	0,0153	7,42	0,1064	0,0149	7,14
SIZE	0,0037	0,0011	3,31	0,0107	0,0031	3,5	0,0066	0,0016	4,04
GROWOPP	-0,0157	0,0014	-11,1	-0,0153	0,0014	-10,64	-0,0156	0,0014	-11
PROF	-0,0645	0,0094	-6,87	-0,0652	0,0095	-6,86	-0,0652	0,0094	-6,91
LIQ	0,0024	0,0006	3,86	0,0027	0,0006	4,34	0,0026	0,0006	4,13
OILES	0,0944	0,0351	2,69	0,1060	0,0336	3,15	0,0946	0,0334	2,83
ALTEN	0,1204	0,0427	2,82	0,1402	0,0418	3,35	0,1192	0,0407	2,93
CHMCL	0,0560	0,0224	2,5	0,0828	0,0217	3,82	0,0672	0,0211	3,19
FSTPA	0,1299	0,0315	4,12	0,1658	0,0307	5,39	0,1460	0,0300	4,87
INDMT	0,0453	0,0245	1,85	0,0719	0,0236	3,05	0,0589	0,0231	2,55
MNING	0,0394	0,0314	1,25	0,0742	0,0308	2,41	0,0501	0,0298	1,68
CNSTM	0,0426	0,0217	1,96	0,0731	0,0211	3,47	0,0577	0,0203	2,84
AERSP	0,0520	0,0305	1,7	0,0718	0,0295	2,43	0,0564	0,0289	1,95
GNIND	0,0762	0,0246	3,1	0,1016	0,0239	4,26	0,0857	0,0231	3,7
ELTNC	0,0429	0,0244	1,76	0,0773	0,0247	3,13	0,0577	0,0232	2,49
INDEN	0,0413	0,0236	1,75	0,0696	0,0236	2,95	0,0546	0,0224	2,44
INDTR	0,1346	0,0249	5,41	0,1608	0,0242	6,65	0,1454	0,0237	6,14
SUPSV	0,1011	0,0268	3,77	0,1255	0,0259	4,84	0,1109	0,0254	4,37
AUTMB	0,0805	0,0239	3,37	0,0931	0,0224	4,16	0,0854	0,0224	3,81
BEVES	0,0339	0,0268	1,26	0,0557	0,0255	2,18	0,0414	0,0253	1,64
FOODS	0,0443	0,0217	2,04	0,0709	0,0210	3,37	0,0556	0,0205	2,72
HHOLD	0,0597	0,0238	2,51	0,0881	0,0238	3,7	0,0693	0,0226	3,07
LEISG	0,0183	0,0295	0,62	0,0460	0,0286	1,61	0,0297	0,0279	1,07
PERSG	0,0415	0,0232	1,79	0,0677	0,0230	2,94	0,0537	0,0220	2,44
TOBAC	0,0508	0,0323	1,57	0,0734	0,0302	2,43	0,0618	0,0305	2,03
HCEQS	0,0289	0,0264	1,09	0,0543	0,0262	2,08	0,0374	0,0252	1,49
PHARM	-0,0002	0,0256	-0,01	0,0330	0,0247	1,34	0,0159	0,0242	0,66
FDRGR	0,0330	0,0270	1,22	0,0394	0,0254	1,55	0,0279	0,0254	1,1

Table 6.9 (b) Analysis of all countries by pooling-macroeconomic condition variables with variable *corporate tax rate (CORTAX)* (cont'd)

Variable	Base			With Country Dummies			With Region Dummies		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
GNRET	0,0440	0,0236	1,87	0,0634	0,0226	2,8	0,0501	0,0222	2,26
MEDIA	0,0642	0,0259	2,48	0,0887	0,0250	3,55	0,0711	0,0244	2,92
TRLES	0,0953	0,0239	3,98	0,1265	0,0230	5,49	0,1093	0,0226	4,84
TELMB	0,1044	0,0330	3,17	0,1144	0,0308	3,72	0,1039	0,0311	3,34
RLISV	0,0770	0,0335	2,3	0,1169	0,0335	3,49	0,0919	0,0321	2,87
SFTCS	0,0253	0,0269	0,94	0,0509	0,0273	1,86	0,0316	0,0257	1,23
TECHD	0,0340	0,0285	1,19	0,0572	0,0273	2,09	0,0448	0,0270	1,66
DEU				-0,0051	0,0166	-0,31			
BRA				0,0119	0,0360	0,33			
IDN				-0,0977	0,0403	-2,43			
FRA				0,0028	0,0231	0,12			
UK				0,0009	0,0222	0,04			
JPN				-0,0724	0,0208	-3,48			
MYS				-0,0479	0,0222	-2,16			
MEX				-0,0269	0,0198	-1,35			
EGY				-0,0845	0,0385	-2,2			
SAU				-0,0471	0,0279	-1,69			
TUR				-0,0418	0,0282	-1,48			
JOR				-0,0703	0,0341	-2,06			
SA							-0,0062	0,0168	-0,37
EU							-0,0084	0,0118	-0,71
MENA							-0,0630	0,0198	-3,18
PAC							-0,0620	0,0117	-5,3
_CONS	-0,0231	0,0342	-0,68	-0,0556	0,0755	-0,74	-0,0106	0,0481	-0,22

6.4.Analysis of regions

The results found in section 6.3 suggest that each region has distinct features which distinguish them from other regions as regards the capital structure decisions of the firms. Therefore, in this section each region is analyzed separately for macroeconomic conditions and financial sector variables. The data of the countries are pooled in four samples in accordance with the regions and Hausman-Taylor method is used to estimate the models. The regional classification made in Chapter 5 considers USA together with Western Europe. This classification made by UN reflects the geopolitical aspects. However, in this section USA is taken apart from European countries because of the distinct features of Europe in terms of financial system and legal aspects. The results are presented in Tables 6.10 and 6.11 for South (Latin) America (SA), Europe (EU), Middle East and North Africa (MENA) and Asia-Pacific (PAC) regions. Although Turkey is more related with the Europe with its institutions and legal system, the individual analyses of the countries suggest that it is to be analyzed within MENA group.

Table 6.10 demonstrates the results with macroeconomic condition variables. In regional analysis only CORTAX is used, because in the previous section the analyses with CORTAX yield significant coefficients for regional dummy variables. In SA and PAC, CORTAX is significant with positive sign. However, it is insignificant in EU and MENA. Inflation has positive and significant impact in SA and EU, while its coefficient is significant at the 5% level with a negative sign in PAC. The coefficient for GDP is significant with a negative sign in EU, MENA and PAC. Among the indices, in PAC, credit depth of information and time to resolve insolvency is significant. In MENA only business extent of disclosure is marginally significant with a positive sign. Since the indices do not vary over time for most of the countries, the analysis for a group of only three countries does not yield significant results.

Table 6.10 Analysis of regions by pooling-macroeconomic condition variables with variable *corporate tax rate (CORTAX)*

VARIABLE	SA			EU			MENA			PAC		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
CORTAX	1,6765	0,6312	2,66	-0,1242	0,0895	-1,39	-0,1002	0,0807	-1,24	0,603275	0,196066	3,08
INF	0,0360	0,0058	6,26	0,0048	0,0019	2,47	0,0009	0,0006	1,56	-0,00371	0,001475	-2,52
GDP	0,0015	0,0012	1,25	-0,0024	0,0006	-4,38	-0,0017	0,0005	-3,24	-0,00115	0,000593	-1,95
CDII				-0,0090	0,0136	-0,66	-0,0024	0,0047	-0,51	0,023169	0,009173	2,53
SLRI				0,0072	0,0059	1,22	0,0027	0,0049	0,56	0,015293	0,013561	1,13
BEDI	0,0394	0,0154	2,55	-0,0037	0,0049	-0,76	0,0073	0,0037	1,96	-0,01942	0,011491	-1,69
TRI							-0,0204	0,0143	-1,43	0,057119	0,016443	3,47
TANG	0,0524	0,0467	1,12	0,0753	0,0386	1,95	0,0365	0,0280	1,3	0,221317	0,025824	8,57
SIZE	-0,0138	0,0094	-1,47	0,0270	0,0079	3,43	0,0038	0,0040	0,96	0,004298	0,00674	0,64
GROWOPP	-0,0097	0,0043	-2,25	-0,0375	0,0036	-10,33	-0,0033	0,0021	-1,59	-0,01558	0,003694	-4,22
PROF	0,0038	0,0282	0,13	-0,0706	0,0136	-5,21	-0,0295	0,0206	-1,43	-0,09058	0,022874	-3,96
LIQ	0,0157	0,0053	2,94	0,0143	0,0029	4,92	0,0042	0,0020	2,14	0,001653	0,000684	2,42
OILES	0,0832	0,1060	0,78	0,1745	0,0671	2,6				0,087415	0,073508	1,19
ALTEN	-0,0270	0,1295	-0,21	0,2207	0,0643	3,44						
CHMCL	0,0821	0,0837	0,98	0,1258	0,0439	2,87	0,0635	0,0427	1,49	0,032148	0,044887	0,72
FSTPA	0,1875	0,1282	1,46	0,1469	0,0664	2,21	0,1083	0,0646	1,68	0,162427	0,056364	2,88
INDMT	0,0029	0,0842	0,03	0,0668	0,0609	1,1	0,0278	0,0463	0,6	0,064246	0,045285	1,42
MNING	-0,1317	0,1302	-1,01	0,3732	0,0961	3,88	0,0351	0,0733	0,48	0,052406	0,049761	1,05
CNSTM	-0,0135	0,0838	-0,16	0,1376	0,0420	3,27	0,0102	0,0410	0,25	0,037609	0,043979	0,86
AERSP	0,0161	0,1272	0,13	0,0789	0,0473	1,67				0,062862	0,068756	0,91
GNIND	0,0415	0,0918	0,45	0,1587	0,0447	3,55	-0,0019	0,0504	-0,04	0,098882	0,04987	1,98

Table 6.10 Analysis of regions by pooling - macroeconomic condition variables with variable *corporate tax rate (CORTAX)* (cont'd)

VARIABLE	SA			EU			MENA			PAC		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
ELTNC	-0,0513	0,1273	-0,4	0,1599	0,0532	3,01	0,0115	0,0509	0,23	0,059012	0,047434	1,24
INDEN	0,1252	0,1074	1,17	0,1115	0,0478	2,33	0,0038	0,0478	0,08	0,071034	0,048227	1,47
INDTR	0,1264	0,0867	1,46	0,2172	0,0498	4,36	0,0968	0,0511	1,9	0,11738	0,047078	2,49
SUPSV	-0,0494	0,0942	-0,52	0,1562	0,0496	3,15	-0,0536	0,0737	-0,73	0,182259	0,048167	3,78
AUTMB	0,0192	0,0877	0,22	0,1170	0,0413	2,83	0,0025	0,0474	0,05	0,117953	0,045652	2,58
BEVES	0,0177	0,0969	0,18	0,1449	0,0511	2,84	-0,0349	0,0629	-0,55	0,038375	0,04853	0,79
FOODS	-0,0248	0,0795	-0,31	0,1078	0,0436	2,47	0,0452	0,0422	1,07	0,032728	0,042221	0,78
HHOLD	0,0061	0,0845	0,07	0,0943	0,0490	1,92	0,0494	0,0478	1,03	0,057651	0,050773	1,14
LEISG				0,1252	0,0543	2,31	0,0930	0,0715	1,3	0,021489	0,053565	0,4
PERSG	-0,0648	0,0828	-0,78	0,0947	0,0462	2,05	0,0362	0,0458	0,79	0,055983	0,046795	1,2
TOBAC	-0,0860	0,1293	-0,67	0,1619	0,0663	2,44	0,0473	0,0631	0,75	0,060179	0,05413	1,11
HCEQS	-0,1076	0,0917	-1,17	0,1369	0,0512	2,67	0,0063	0,0748	0,08	0,089243	0,051666	1,73
PHARM				0,1205	0,0505	2,38	-0,0055	0,0491	-0,11	0,013977	0,046596	0,3
FDRGR	-0,0618	0,0867	-0,71	0,0686	0,0422	1,63	-0,0514	0,0968	-0,53	0,024934	0,059324	0,42
GNRET	-0,0466	0,0819	-0,57	0,1250	0,0450	2,78	0,0074	0,0471	0,16	0,0832	0,047051	1,77
MEDIA	0,0067	0,0946	0,07	0,1263	0,0464	2,72	0,0064	0,0546	0,12	0,102831	0,051783	1,99
TRLES	0,0473	0,0921	0,51	0,2349	0,0446	5,27	0,0466	0,0457	1,02	0,080085	0,045625	1,76
TELMB	0,0570	0,1045	0,55	0,2217	0,0675	3,28	0,2081	0,0730	2,85	0,054836	0,061859	0,89
RLISV	-0,0413	0,0928	-0,44	0,4179	0,0934	4,48	0,0544	0,0560	0,97			
SFTCS	-0,0751	0,1121	-0,67	0,1126	0,0541	2,08				0,041789	0,057432	0,73
TECHD	-0,1080	0,1286	-0,84	0,1259	0,0514	2,45	-0,0505	0,0717	-0,7	0,047257	0,051191	0,92
_CONS	-0,6386	0,2942	-2,17	-0,3234	0,1967	-1,64	0,0167	0,0808	0,21	-0,47325	0,290779	-1,63

Table 6.11 Analysis of regions by pooling-financial sector development variables with variable *corporate tax rate (CORTAX)*

VARIABLE	SA			EU			MENA			PAC		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
CORTAX	1,4844	0,5998	2,48	-0,1109	0,1459	-0,76	0,0563	0,1013	0,56	0,472433	0,251956	1,88
BCA	-0,0025	0,0086	-0,28	-0,0068	0,0060	-1,14	-0,0053	0,0038	-1,39	-0,0076	0,003537	-2,15
BC	-0,0010	0,0007	-1,58	-0,0006	0,0009	-0,62	0,0010	0,0006	1,62	-0,00057	0,000893	-0,64
BROA	-0,0396	0,0068	-5,82	0,0006	0,0110	0,06	-0,0041	0,0032	-1,3	0,032335	0,015072	2,15
SMC	-0,0009	0,0006	-1,45	-0,0005	0,0002	-3,15	-0,0004	0,0001	-3,07	-0,00103	0,000144	-7,12
CDII				0,0143	0,0154	0,93	-0,0100	0,0062	-1,6	0,027335	0,012096	2,26
SLRI				0,0026	0,0072	0,36	0,0024	0,0054	0,45	0,033449	0,014171	2,36
BEDI	0,0092	0,0146	0,63	0,0084	0,0058	1,45	0,0101	0,0052	1,95	-0,02621	0,016803	-1,56
TRI							-0,0398	0,0337	-1,18	0,044397	0,014391	3,09
TANG	0,0587	0,0468	1,25	0,0688	0,0387	1,78	0,0442	0,0254	1,74	0,207145	0,025488	8,13
SIZE	-0,0136	0,0096	-1,42	0,0274	0,0078	3,5	0,0041	0,0041	0,99	0,002869	0,006434	0,45
GROWOPP	-0,0097	0,0044	-2,23	-0,0362	0,0037	-9,88	-0,0034	0,0019	-1,84	-0,01041	0,00366	-2,84
PROF	0,0023	0,0282	0,08	-0,0732	0,0135	-5,42	-0,0253	0,0189	-1,34	-0,07748	0,022284	-3,48
LIQ	0,0147	0,0053	2,76	0,0142	0,0029	4,9	0,0042	0,0018	2,37	0,00157	0,000664	2,37
OILES	0,0866	0,1057	0,82	0,1754	0,0674	2,6				0,076706	0,074244	1,03
ALTEN	-0,0255	0,1292	-0,2	0,2222	0,0644	3,45						
CHMCL	0,0838	0,0834	1	0,1263	0,0440	2,87	0,0630	0,0930	0,68	0,029384	0,045375	0,65
FSTPA	0,1872	0,1278	1,46	0,1488	0,0666	2,23	0,0997	0,1389	0,72	0,162521	0,056833	2,86
INDMT	0,0047	0,0839	0,06	0,0669	0,0611	1,09	0,0293	0,1007	0,29	0,061142	0,045846	1,33
MNING	-0,1299	0,1298	-1	0,3753	0,0964	3,89	0,0258	0,1588	0,16	0,046432	0,050409	0,92
CNSTM	-0,0109	0,0836	-0,13	0,1374	0,0422	3,26	0,0117	0,0886	0,13	0,035723	0,044525	0,8
AERSP	0,0190	0,1268	0,15	0,0777	0,0475	1,64				0,054021	0,068937	0,78
GNIND	0,0420	0,0915	0,46	0,1593	0,0448	3,55	0,0014	0,1086	0,01	0,096842	0,050294	1,93

Table 6.11 Analysis of regions by pooling - financial sector development variables with variable *corporate tax rate (CORTAX)* (cont'd)

VARIABLE	SA			EU			MENA			PAC		
	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t	Coeff.	se	t
ELTNC	-0,0485	0,1269	-0,38	0,1604	0,0532	3,02	0,0100	0,1109	0,09	0,055567	0,047891	1,16
INDEN	0,1283	0,1072	1,2	0,1120	0,0479	2,34	0,0066	0,1024	0,06	0,065117	0,048722	1,34
INDTR	0,1276	0,0865	1,48	0,2185	0,0499	4,38	0,0898	0,1089	0,82	0,117443	0,047603	2,47
SUPSV	-0,0480	0,0941	-0,51	0,1558	0,0497	3,13	-0,0473	0,1596	-0,3	0,180598	0,048881	3,69
AUTMB	0,0197	0,0876	0,23	0,1168	0,0415	2,82	0,0056	0,1034	0,05	0,117387	0,04634	2,53
BEVES	0,0200	0,0966	0,21	0,1441	0,0512	2,81	-0,0283	0,1379	-0,21	0,031819	0,049208	0,65
FOODS	-0,0229	0,0793	-0,29	0,1084	0,0438	2,48	0,0440	0,0907	0,49	0,028921	0,042817	0,68
HHOLD	0,0101	0,0844	0,12	0,0944	0,0491	1,92	0,0500	0,1036	0,48	0,053904	0,051109	1,05
LEISG				0,1252	0,0544	2,3	0,0889	0,1576	0,56	0,017414	0,054362	0,32
PERSG	-0,0626	0,0825	-0,76	0,0936	0,0464	2,02	0,0388	0,0969	0,4	0,049692	0,047197	1,05
TOBAC	-0,0828	0,1289	-0,64	0,1587	0,0667	2,38	0,0343	0,1385	0,25	0,043413	0,05493	0,79
HCEQS	-0,1046	0,0916	-1,14	0,1366	0,0513	2,66	-0,0087	0,1604	-0,05	0,082384	0,052358	1,57
PHARM				0,1197	0,0507	2,36	-0,0103	0,1060	-0,1	0,006026	0,047224	0,13
FDRGR	-0,0595	0,0864	-0,69	0,0690	0,0424	1,63	-0,0442	0,2082	-0,21	0,020579	0,05989	0,34
GNRET	-0,0447	0,0816	-0,55	0,1252	0,0452	2,77	0,0052	0,1017	0,05	0,082144	0,04778	1,72
MEDIA	0,0092	0,0943	0,1	0,1251	0,0465	2,69	0,0056	0,1195	0,05	0,099887	0,052281	1,91
TRLES	0,0475	0,0919	0,52	0,2358	0,0447	5,27	0,0405	0,0966	0,42	0,079858	0,046285	1,73
TELMB	0,0575	0,1042	0,55	0,2207	0,0679	3,25	0,2021	0,1592	1,27	0,053015	0,062756	0,84
RLISV	-0,0363	0,0926	-0,39	0,4130	0,0937	4,41	0,0449	0,1170	0,38			
SFTCS	-0,0726	0,1119	-0,65	0,1120	0,0542	2,07				0,034444	0,05786	0,6
TECHD	-0,1041	0,1282	-0,81	0,1252	0,0515	2,43	-0,0421	0,1577	-0,27	0,044837	0,051925	0,86
_CONS	-0,0443	0,2713	-0,16	-0,4003	0,2256	-1,77	0,1003	0,1790	0,56	-0,34284	0,300872	-1,14

The results in Table 6.10 compared with those in Tables 6.6 (a)-(c) imply that pooling the data of the SA and MENA region does not contribute to the significance of the variables. The countries of these two regions do not have more significant coefficients when they are analyzed after pooling the data. However, the analysis of EU region yields more significant coefficients for macroeconomic condition, firm-specific and industry dummy variables than the individual analyses. The analysis of EU countries as a whole indicates that the firms with more tangible assets borrow more. As they become larger in scale, they can increase their leverage level. The more liquid their assets are, the more debt they utilize. On the contrary, the European firms with more growth opportunity use less debt. In addition, if they become more profitable, they prefer less debt in their balance sheet. For European firms, the results also demonstrate that the industry is a highly significant determinant of leverage. Almost all of the coefficients for industry dummies are significant at the 5% level.

When the analysis is repeated with financial sector variables, CORTAX is again significant only in SA and PAC region as seen in Table 6.11. Bank capital to assets ratio has negative and significant impact only in PAC. Bank concentration is significant in none of the regions. Bank return on assets has negative impact on leverage in SA, whereas it has positive influence in PAC region. The opposite signs in two regions for the effect of banks' return on leverage may originate from the differences in the banking system of two regions. The banking systems of PAC countries are used by the governments to boost their economy. Therefore, a state supported banking system may enable the banks to increase returns and provide more loans at the same time. However, in SA the banking system is more liberal. They can follow strategies to increase their profit only by risking losing customers because of higher costs of borrowing. Stock market capitalization to GDP has negative and significant impact on leverage in EU, MENA, and PAC. Among the country-specific variables stock market capitalization to GDP is almost always significant whichever sample is analyzed. The indices and time to resolve insolvency have significant coefficients only in PAC as it is also the case with macroeconomic variables. When the industry dummies and firm-specific variables are taken into account, EU is the only region where they have significant coefficients. The firm-specific variables except size have also

significant impact in PAC. Liquidity and growth opportunity are the only variables that have significant coefficients for all regions with positive and negative signs, respectively.

CHAPTER 7

CONCLUSION

In this research, the capital structure determinants are examined with data of firms from developing countries as well as the developed ones. The significance of firm-specific variables, the country-specific variables, and the industry of the firms is investigated by constructing a sample of firms from 14 countries which has distinct macroeconomic conditions, financial market development level and legal system. The leverage of firms is measured by taking only long term debt into account since the short term debt comprises obligations which bear characteristics distinct from those of debt.

Before conducting sophisticated analysis of data, the summary statistics of the variables are examined. The mean long-term debt ratios of the countries vary between 5 and 15 percent. The highest leverage is observed in USA, Mexico, Brazil, Japan and Indonesia in descending order. The lowest average long-term debt ratio belongs to Jordan, Egypt and Turkey in ascending order. Since the mean debt ratios of the countries do not differentiate significantly, it is difficult to identify the impacts of the variables just by observing rough data. However, even the observation of the summary statistics of the variables suggests that the size has positive and liquidity has negative impact on average debt ratios. The ranking of the countries with respect to *Credit depth of information index (CDII)* demonstrate that the countries with the highest value of the index are the countries with more levered firms on average. The ranking of the countries also indicate that the countries with high mean debt ratios such as USA, Mexico and Japan have less time necessary to resolve insolvency.

After examining the summary statistics of the variables, the individual analysis of countries is performed with both fixed effects and Hausman-Taylor model. In both models, the firm-specific determinants are comprised in every analysis. However, the country-

specific variables cannot be included at the same time since the high correlation among them reduces the explanatory power. Because the main objective is cross-country comparison of the impacts of certain variables on capital structure decisions, the country-specific variables are analyzed in two separate models. The variables are classified in two groups named as macroeconomic condition variables and financial sector development variables, and every analysis is repeated for each group.

The fixed-effects model handles the unobserved heterogeneity issue by sacrificing time-invariant variables. As a base model, each country of the sample is first analyzed with fixed effects model. The results of fixed effects model without country-specific variables indicate that the coefficient for tangibility is positive and significant at the 5% level for countries UK, France, Germany, Japan, Malaysia, Indonesia, Chile and Turkey, and at the 10% level for Mexico and Egypt. The coefficient for size is positive and significant for countries, UK, France, Germany, Malaysia, Mexico, and Saudi Arabia at the 5% level and for Egypt at the 10% level. However, it is negative and significant for US, Indonesia, and Brazil at the 5% level. The coefficients for growth opportunities are negative for all of the countries. Though profitability is significant in less number of countries than growth opportunity is, its impact is negative as well. The coefficients for liquidity are positive and significant in UK, USA, France, Japan, Mexico and Chile at the 5% level. The fixed effects model with two groups of country specific variables generates similar results for firm-specific variables. The results for macroeconomic condition variables do not suggest a common tendency except for the GDP per capita growth. In UK, USA, France, Germany, Japan, Indonesia, and Turkey, GDP per capita growth has negative and significant impact on the debt ratios of the firms. The fixed effects model incorporating the financial sector development variables show that in USA, France, Germany, Brazil and Chile, the coefficients for bank return on assets are negative and significant at the 5% level. Stock market capitalization to GDP ratio has negative and significant impact on debt ratio in UK, France, Japan, Indonesia, and Turkey according to the results of fixed-effects model.

The main objective in this research is to investigate the impact of variables that demonstrate negligible or no variation in time. After testing each country one-by-one with fixed effects model, same procedure is followed by employing Hausman-Taylor model which helps include the variables that are constant over time span. In Hausman-Taylor the

industry dummies and effective rate variables are incorporated into the model. Fixed effects and Hausman-Taylor models generate almost the same coefficients with the same level of significance for the variables common in both models. The similarity between the results of two models implies that the endogeneity assumption of Hausman-Taylor model about the firm-specific variables is feasible. Moreover, Hausman-Taylor method helps analyze the impact of the tax variable and industry dummies. The coefficient for tax rate variable is positive and significant at the 5% level in USA and at the 10% level in Mexico. In other countries, the coefficients do not indicate a significant relationship between the tax rate and debt ratios of the firms. As to the coefficients of industry dummies, the coefficients for most of the industries in UK, France and Malaysia are significant.

After the individual analyses of all countries are conducted, the data of all the countries are pooled. The pooled sample is analyzed with Hausman-Taylor in order to include country-specific variables which do not exhibit sufficient variation over time such as c*redit depth of information index (CDII), strength of legal rights index (SLRI), business extent of disclosure index (BEDI),* and *time to resolve insolvency (TRI)*. The pooled sample is analyzed successively with financial sector development and macroeconomic conditions variables. In order to test the impact of tax regime in a country as accurate as possible with the available data, the *corporate tax rate (CORTAX)* collected by KPMG and *the tax rate (TAX)* calculated from the financial statements of each firm is tested separately.

The results show that the tax rate (TAX) is not significant whether it is analyzed with the financial sector development or macroeconomic condition variables. However, KPMG's corporate tax variable (CORTAX) is significant at the 5% level within the model involving macroeconomic conditions. It is significant at the 10% level when the financial sector development variables are considered. In the model with TAX variable, the inflation rate has positive whereas GDP has negative significant impact on the leverage of firms. The financial sector development variables are significant as well. The results exhibit that as bank capital to assets ratio increase, the debt ratios of firms decrease. Increasing return on bank assets results in a reduction in the leverage of the firms. Bank concentration variable is also significant with a negative sign in the analysis of the pooled data. The results also suggest that as the stock market enlarges, the firms prefer less leverage in their balance sheet. The overall evaluation of the financial market development variables

supports the argument that the availability of the external funding resources may alter the financing decisions of firms.

The model with TAX variable generates significant coefficients for all firm-specific variables. The estimation of Hausman-Taylor method exhibit that tangibility, size and liquidity has positive impact whereas the growth opportunity and profitability has negative impact on the long term debt ratios of the firms. The considerable number of industries with significant coefficients suggests that industry is a determinant of leverage. The three indices CDII, BEDI, SLRI and the variable TRI analyzed with the pooled data all have significant coefficients. The estimations show that when the credit history of firms are kept as precisely as possible, the firms use debt more conservatively. As the firms share more information about their financial position, the investors tend to invest more on equity, and hence firms find equity financing more feasible. If the regulations in a country are better designed to protect borrowers and lenders, more debt is utilized by the firms. If the number of years from the filing for insolvency in court until the resolution of distressed assets increases in a country, the firms prefer sources of financing other than debt.

The country and region dummies are included in the analysis in order to identify the significance of the unobserved country-specific determinants of leverage. Few number of countries have significant coefficients for dummies. However, the significance of region dummies suggests that there are region-wide unobserved determinants other than the country-specific variables used in the models, which differentiate the leverage of the firms.

The pooled data is re-analyzed by replacing the tax rate (TAX) variable with corporate tax rate (CORTAX) variable. The results are similar with those obtained with TAX variable except that the significance of the indices, bank capital to assets ratio and bank concentration is reduced. However, the significance of industry dummies increase with CORTAX. The number of countries and regions with significant dummies also increase when CORTAX is used in the model.

In the last stage of the analysis, the data is pooled in four groups, each one of which is corresponding to a region. By Hausman-Taylor method, South (Latin) America (SA), Europe (EU), Middle East and North Africa (MENA) and Asia-Pacific (PAC) regions are analyzed separately with tax regime being proxied by CORTAX only. In SA and PAC, CORTAX is significant with positive sign. However, it is insignificant in EU and MENA.

Inflation has positive and significant impact in SA and EU, while its coefficient is significant at the 5% level with a negative sign in PAC. The coefficient for GDP is significant with a negative sign in EU, MENA and PAC. Among the indices, in PAC, credit depth of information and time to resolve insolvency is significant. In MENA only business extent of disclosure is marginally significant with a positive sign.

The regional analysis repeated with financial sector variables reveals that CORTAX is again significant in SA and PAC region. Stock market capitalization to GDP has negative and significant impact on leverage in EU, MENA, and PAC. The indices and time to resolve insolvency have significant coefficients only in PAC. EU is the region where all the firm-specific variables and industry dummies have significant coefficients. The firm specific variables except size have significant impact in PAC as well. Liquidity and growth opportunity are the only variables that have significant coefficients for all regions with positive and negative signs, respectively.

The analyses of the whole sample, regions, and the countries demonstrate that the firm specific variables are the right proxies for the parameters set forth in the theoretical framework. Even in the individual analysis of the developing countries with scarce data, the results obtained comply with theoretical propositions. The coefficients for tangibility and firm size support the relevance of trade-off theory, whereas the profitability has mostly negative impact as pecking order theory predicts. The analyses generate significant results for countries with sufficient data which are in EU and PAC region. Especially the industry dummies become significant as long as the data permits. MENA and SA region needs more firm data for making more sound judgment.

The previous research has dealt with endogeneity problem with fixed effects method applied with panel data. This methodology ignores the effects of time-invariant firm and country-specific variables. In order to overcome this issue, Hausman-Taylor method is implemented. Significant and consistent estimates are obtained through the use of Hausman-Taylor method especially for inflation rate, GDP per capita growth, and the financial sector development variables. This research suggests that the financing decisions of firms are highly influenced by the features of the banking system and the size of the stock market. High correlation between the macroeconomic conditions and the financial markets does not permit the analysis of one model encompassing every attribute. However,

overall evaluation of the results suggests that financial market development is more relevant for the leverage than the macroeconomic conditions. The macroeconomic condition variables such as GDP and inflation are correlated with vast number of observed and/or unobserved heterogeneity in a country. This leads to misspecification of country-specific variables affecting the leverage decisions of firms.

In this study, it is also demonstrated that well-functioning legal system facilitates borrowing. It is also proved empirically that the increasing transparency of firms leads to more equity financing and less debt usage.

The tax advantage of debt financing is a crucial element of capital structure theory. However, the complexity of tax regime in a country forces the researchers to use proxies such as nondebt tax shields. In this study, two tax rates have been used in the analysis. The analysis of pooled data with the aggregate tax rate (CORTAX) implies that the firms use more debt in order to benefit from tax advantages. However, the tax rate (TAX) calculated from the financial statements of firms predicts only when the data is sufficient such as that of USA.

Regarding the results of this research, it is judged that more data and analysis is needed for developing countries. The conflicts between the different theories of capital structure can be resolved with the analysis of samples from countries bearing distinct features.

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APPENDICES

APPENDIX A: FTSE's Industry Classification Benchmark

(Only the sectors used in the sample)

ICB Industry DS Level 2		ICB Supersector DS Level 3		ICB Sector DS Level 4	
Name	**INDC2 Mnemonic**	**Name**	**INDC3 Mnemonic**	**Name**	**INDC4 Mnemonic**
Oil & Gas	OILGS	Oil & Gas	OILGS	Oil & Gas Producers	OILGP
				Oil Equipment & Services	OILES
				Alternative Energy	ALTEN
Basic Materials	BMATR	Chemicals	CHMCL	Chemicals	CHMCL
		Basic Resources	BRESR	Forestry & Paper	FSTPA
				Industrial Metals & Mining	INDMT
				Mining	MNING
Industrials	INDUS	Construction & Materials	CNSTM	Construction & Materials	CNSTM
		Industrial Goods & Services	INDGS	Aerospace & Defense	AERSP
				General Industrials	GNIND
				Electronic & Electrical Equipment	ELTNC
				Industrial Engineering	INDEN
				Industrial Transportation	INDTR
				Support Services	SUPSV
Consumer Goods	CNSMG	Automobiles & Parts	AUTMB	Automobiles & Parts	AUTMB
		Food & Beverage	FDBEV	Beverages	BEVES
				Food Producers	FOODS
		Personal & Household Goods	PERHH	Household Goods & Home Construction	HHOLD
				Leisure Goods	LEISG
				Personal Goods	PERSG
				Tobacco	TOBAC
Health Care	HLTHC	Health Care	HLTHC	Health Care Equipment & Services	HCEQS
				Pharmaceuticals & Biotechnology	PHARM
Consumer Services	CNSMS	Retail	RTAIL	Food & Drug Retailers	FDRGR
				General Retailers	GNRET
		Media	MEDIA	Media	MEDIA
		Travel & Leisure	TRLES	Travel & Leisure	TRLES
				Mobile Telecommunications	TELMB
Financials	FINAN	Real Estate	RLEST	Real Estate Investment & Services	RLISV
Technology	TECNO	Technology	TECNO	Software & Computer Services	SFTCS
				Technology Hardware & Equipment	TECHD

APPENDIX B: Step by step Hausman-Taylor estimation

1. Obtain the fixed effects estimator of $\boldsymbol{\beta}_1$ and $\boldsymbol{\beta}_2$ based on $\mathbf{X}_1$ and $\mathbf{X}_2$. The residual variance estimator from this step is a consistent estimator of σ^2_{ϵ}

2. Use the residuals from step 1 to compute the "intra-group" temporal mean of residuals,

$$\overline{e_\iota} = \frac{\sum_{t=1}^{T} e_{it}}{T}$$

and stack them into a vector.

$$\bar{e}' = \left(\left(\overbrace{\overline{e_1}, \overline{e_1}, \overline{e_1}, \dots, \overline{e_1}}^{T} \right), \dots \dots \dots, \left(\overbrace{\overline{e_n}, \overline{e_n}, \overline{e_n}, \dots, \overline{e_n}}^{T} \right) \right)$$

3. Do a regression $\boldsymbol{Z}_{2i}$ on $\boldsymbol{Z}_{i1}$ and $\boldsymbol{X}_{1it}$. Use the predicted values $\widehat{\boldsymbol{Z}}_{2i}$in the matrix $\boldsymbol{Z} = \left(\boldsymbol{Z}_1^*, \widehat{\boldsymbol{Z}}_{\boldsymbol{2}}^*\right)$for each group i.

4. Regress the vector $\bar{\mathbf{e}}$ on $\mathbf{Z}$ to get estimates of $(\hat{\alpha}_1, \hat{\alpha}_2)$. Obtain σ^{*2}.

5. Obtain σ_u from the following equation

$$\sigma_u^2 = \sigma^{*2} - \frac{\sigma_\epsilon^2}{T}$$

6. Following matrices are constituted in order to calculate the weights for FGLS :

$$\hat{\theta} = \sqrt{\frac{\hat{\sigma}_\epsilon^2}{\hat{\sigma}_\epsilon^2 + T\hat{\sigma}_u^2}}$$

$$W^* = [\boldsymbol{x}_{\mathrm{it1}}, \boldsymbol{x}_{\mathrm{it2}}, \boldsymbol{z}_{\mathrm{i1}}, \boldsymbol{z}_{\mathrm{i2}}] - \hat{\theta}[\boldsymbol{x}_{\mathrm{it1}}, \boldsymbol{x}_{\mathrm{it2}}, \boldsymbol{z}_{\mathrm{i1}}, \boldsymbol{z}_{\mathrm{i2}}]$$

$$y^* = y_{it} - \hat{\theta} y_{it}$$

$$\boldsymbol{v}_{it}^{\prime} = \left[(\boldsymbol{x}_{1it} - \boldsymbol{x}_{1i})^{\prime}, (\boldsymbol{x}_{2it} - \boldsymbol{x}_{2i})^{\prime}, \boldsymbol{z}_{1i}^{\prime}, \overline{\boldsymbol{x}}_{1i}^{\prime}\right]$$

7. Regress W^* on V. Generate the predicted values for $\widehat{W}^*$.

8. Regress y^*on $\widehat{W}^*$ to get $\left(\hat{\beta}^{\prime}, \hat{\alpha}^{\prime}\right)$.

APPENDIX C: CURRICULUM VITAE

Title- Name:	Mr. Emre Basaran
Date – Place of Birth:	03/23/1973 – Ankara/TURKEY
Phone (Work):	+90 312 294 6703
e-mail:	ebasaran@kalkinma.gov.tr
Address:	Kalkınma Bakanlığı Necatibey cad. No:108 Yücetepe/ANKARA

PROFESSIONAL EXPERIENCE

Ministry of Development, Ankara, Turkey **Jun 2011 – present**

Department of Urban and Spatial Development

Head of Department

- Developing policies and strategies for the urbanization in Turkey
- Drafted a central government program for the urban regeneration in Turkey together with the Ministry of Urbanization
- Implementing a program for enhancing the economic development of certain cities in underdeveloped regions in Turkey
- Budgeting the investments of central government agencies in urban land use planning and regeneration, cadastre modernization, and smart city applications
- Approved the programming and financing of Land Register and Cadastre Modernization Project co-financed by the World Bank
- Contributed to the Urbanization Review in Turkey study conducted by the World Bank
- Participating in the country policy dialogues and contributing to the country partnership strategy of Turkey developed by the World Bank

- Supervising the regional development agencies of Turkey in the strategy development, programming and budgeting process.
- Assessed the needs and priorities of underdeveloped regions of Turkey through coordination with the local and national stakeholders, and prepared operational plans

Prime Ministry, State Planning Organization, Ankara, Turkey Aug 2009- Jun 2011

Department of Local Development

Head of Department

- Developed a central government program aimed at enhancing rural transport infrastructure
- Managed a fund amount of 1 billion dollars for the construction of rural roads in the underdeveloped regions
- Prepared the legal framework for the establishment of regional development agencies in 26 regions of Turkey
- Drafted the legislation for the establishment of regional development authorities responsible for the implementation of operational plans in 4 subregions of Turkey
- Coordinated the activities related to the development of a multi-year action plan for East Anatolia region of Turkey
- Implemented programs and activities for capacity building in regional development agencies

Prime Ministry, State Planning Organization, Ankara, Turkey Apr 2000- Aug 2009

Department of Transportation and Energy

Planning Expert

- Developed policies and strategies in road transport
- Conducted economic appraisal of road transport project proposals.
- Budgeted the transport infrastructure investments of the central government institutions
- Developed policies and strategies for the municipalities in urban transport via conducting policy discussions with the representatives of central and local government institutions

- Carried out cost-benefit analysis of bus rapid transit and rail transit project proposals of the municipalities
- Assessed and approved the foreign credit usage of municipalities in the bus procurement and rail transit projects
- Participated in the team assigned for drafting a new framework law regulating the PPP applications in Turkey
- Evaluated BOT project proposals in transport and drafts of contracts before the approval of the Council of Ministers

Prime Ministry, State Planning Organization, Ankara, Turkey Oct 1998- Apr 2000

Department of Urban Infrastructure

Planning Expert

- Budgeted the water supply and sewerage system investments of the municipalities
- Evaluated the water supply and sewerage system project proposals of municipalities requiring foreign funding
- Drafted a regulation for the supervision of foreign credit utilization of municipalities

Yuksel Insaat Saudi Co. Ltd., Medina, Saudi Arabia Oct 1997- Oct 1998

Site Engineer

- Managed the site activities in a water pipeline project comprising of 400 km pipeline and 22 water reservoirs
- Conducted the quality control of the activities and reported to the Saline Water Conversion Corporation of Saudi Arabia

Middle East Technical University, Ankara, Turkey Aug 1995-Oct 1997

Research Assistant

- Supervised an R&D project about earthquake resistant prefabricated buildings funded jointly by government and the private sector

EDUCATION

- Phd in Banking and Finance, Yıldırım Beyazıt University, Turkey
  2011 – May 2016
- Master of Public Policy and Management, Carnegie Mellon University, PA, USA
  2003 - 2005
- MS in Civil Engineering, Middle East Technical University, Turkey
  1995 - 1997
- BS in Civil Engineering, Middle East Technical University, Turkey
  (Ranked 1st out of 195) 1991 - 1995

LANGUAGES

	Speaking	Reading	Writing
• English	Excellent	Excellent	Excellent
• French	Fair	Good	Good

COMPUTER SKILLS

- Office Applications
- Econometrics (Stata, EViews, SPSS)
- Web design (Dreamweaver, Fireworks)

PRESENTATIONS

- Experience of Turkey in Public Private Partnerships for Infrastructure Development, Capacity Training Workshop on Private-Public Partnerships in Jordan (MENA-OECD Investment Programme), Amman, Jordan, 2007
- Legal Framework for the Public Private Partnership Projects in Turkey, European Finance Convention, İstanbul, TURKEY, 2007

APPENDIX D: TURKISH SUMMARY

EKONOMİK KOŞULLAR İLE MALİ PİYASALARIN GELİŞMİŞLİĞİNİN FİRMALARIN SERMAYE YAPISI KARARLARINA ETKİLERİ

BÖLÜM 1

GİRİŞ

Literatürde firmaların sermaye yapısı kararlarını etkileyen faktörleri araştırmış birçok çalışma bulunmaktadır. Miller ve Modigliani'nin 1958 yılındaki çığır açan çalışmalarından bu yana firmaların borç kullanma oranlarını etkileyen değişkenleri ortaya koyan farklı teoriler geliştirilmiştir. Geçmiş çalışmalar büyük oranda yeterli veriye sahip gelişmiş ülkelerdeki firmaların borçluluk oranlarını etkileyen firma düzeyindeki değişkenlere odaklanmıştır. Geliştirilmiş modellerin açıklayıcılığının yeterli düzeyde olmaması sayısallaştırılamayan firma ve ülke özelinde bazı etkenlerin varlığını gündeme getirmiştir. Gelişmekte olan ülke piyasalarındaki ilerlemelerin neticesinde veri altyapısının yaygınlaşması ülke düzeyindeki bazı değişkenlerin incelenebilmesini sağlamıştır. Bununla birlikte gelişmekte olan ülkelere dair zaman serisini haiz veri yetersizliği ile test edilen modellerdeki içsellik sorunu araştırmacıların kapsayıcı ve açıklayıcılığı yüksek model kurmalarının önünde engel olmaya devam etmektedir.

Bu araştırmanın iki temel amacı bulunmaktadır. Birinci amaç firma düzeyinde yeterli miktarda varyasyona sahip değişkenlerin etkilerinin ülkeler arasında karşılaştırmasını yapmaktır. İkinci amaç zamanda sabit değişkenlerin etkilerini incelemektir. İkinci amaç için bütün veri havuzu Hausman-Taylor metodolojisiyle analiz edilmiştir.

Bu araştırmada sermaye yapısını etkileyen bütün değişkenleri ortaya koyan kapsayıcı bir model ortaya koymak amaçlanmamıştır. İçsellik sorunu ve ülkelere özgü değişkenlerin arasındaki yüksek korelasyon bütün değişkenlerin modelde içerilmesine

engel olmaktadır. Asıl amaç ülkeler arası karşılaştırma yapmak olduğundan değişkenler gruplanmış ve testler her bir grup veri için tekrar edilmiştir.

BÖLÜM 2

TEORİK ÇERÇEVE

Bu bölümde sermaye yapısı teorileri kısaca özetlenmiştir. Miller ve Modigliani'nin önermeleri irdelenmiş, ardından geliştirilen ana teoriler karşılaştırmalı olarak incelenmiştir.

Sermaye yapısına dair modern teorik ilk çalışmalar Miller ve Modigliani'nin sermaye maliyeti, firma değeri ve sermaye yapısı ilişkisini ortaya koyan çalışmalarıdır. Miller ve Modigliani önermelerini aşağıdaki varsayımlara dayanarak geliştirmişlerdir:

a. Bireysel yatırımcılar sıfır riskli oran üzerinden borç alıp verebilirler.
b. İflasın herhangi bir maliyeti bulunmamaktadır.
c. Firmalar sadece sıfır riskli borç ya da sermaye payı ihraç edebilirler.
d. Bütün firmalar aynı risk sınıfına aittirler.
e. Firma ile yatırımcılar arasında bilgi asimetrisi bulunmamaktadır.
f. Firma yöneticileri firma sahiplerinin varlığını artırmak için çalışmaktadırlar.
g. Piyasalarda işlem maliyeti bulunmamaktadır.

Bir numaralı önermelerinde yukarıdaki koşullar gerçekleştiği takdirde kurumlar vergisinin olmadığı durumda firma değerinin sermaye yapısından bağımsız olduğunu gösteren araştırmacılar, iki numaralı önermelerinde özkaynak maliyetinin ağırlıklı ortalama sermaye maliyetine, borç maliyetine ve firmanın borç/özsermaye oranına bağlı olduğunu belirtmişlerdir. Üçüncü ve son önermelerinde ise firmanın bir yatırım fırsatını değerlendirebilmesi için yatırım getirisinin ağırlıklı ortalama sermaye maliyetinden fazla olması gerektiğini göstermişlerdir. Miller ve Modigliani daha sonraki çalışmalarında faiz ödemelerinin vergi matrahından düşülmesini hesaba katarak önermelerini revize etmişlerdir. Revize önermelerinde artık firma değeri finansman tercihlerinden bağımsız değildir. Araştırmacılar borç ödemelerindeki vergi avantajından faydalanabilmek için yöneticilerin borçlanmayı tercih etmeleri çıkarımında bulunmaktadırlar.

Miller ve Modigliani'nin borçlanmaya dayalı vergi muafiyetini hesaplarına katmalarının ardından yeni bir tartışma başlamıştır: Firmalar hangi noktaya kadar

borçlanmaya devam edeceklerdir? Kraus ve Litzenberger (1973), Baron (1975), Scott (1977) ve Schneller (1980) borçlanmanın artırdığı iflas riskinin maliyetini ortaya koyarak borç oranının, potansiyel iflas maliyetinin borçtan kaynaklanan vergi avantajını dengelediği noktaya kadar artırılabileceğini iddia etmişlerdir. Dengeleme Teorisi olarak adlandırılan bu teorinin açıklaması kolay olmakla birlikte ampirik olarak ispatı zordur. Zira iflas gerçekleşmeden muhtemel maliyetini ortaya koymak kolay değildir. Buna karşılık Altman (1984), Warner (1977), Ang, Chua ve McConnell (1982) gibi bazı araştırmacılar doğrudan ve dolaylı olmak üzere iflasın maliyetini yaşanmış vakalar üzerinden hesaplamayı denemişlerdir. Bazı araştırmacılar ayrıca dinamik modeller geliştirmişlerdir. Beklentileri ve işlem maliyetlerini hesaba katan araştırmacılar firmaların belirli bir borçlanma oranı hedefi olduğunu, bu hedefi tutturmak için işlem maliyetlerini dikkate alarak borçlanma oranını belirlediklerini iddia etmişlerdir. Fama ve French (2002), Kayhan ve Titman (2007), Leary ve Roberts (2005) dinamik olarak belirli bir hedef doğrultusunda borçlanma oranının belirlendiğini ampirik olarak göstermişlerdir.

Jensen ve Meckling (1976) vekalet maliyetinin optimal borç oranını belirleyici bir etken olduğunu iddia etmişlerdir. Araştırmacılar firmalarda iki tip çıkar çatışması belirlemişlerdir: 1) Hissedarlar ile yöneticiler arası 2) borç verenlerle pay sahipleri arasında. Yöneticiler kendi çıkarları adına hareket ederler. Buna engel olmanın yolu yöneticilerin hisse payının artırılması ya da borçlanmadır. Borçlanma idarecilerin kullanımına açık nakit fazlasını azaltacak, yönetimi disipline edecektir. Araştırmacılara göre vekalet açısından özsermayenin getirdiği bu maliyetin yanında sermayedar ile borç sahibi arasındaki çıkar çatışmasının da maliyeti vardır. Riskli bir yatırımın getireceği fazla getiri tamamen pay sahiplerine aktarılacağından borç verenler bu durumu hesaba katarak borçlanma maliyetini yükseltirler. Jensen ve Meckling (1976) sözkonusu maliyetlerin dengelendiği noktanın optimal borç oranı olacağını iddia etmişlerdir.

Bilgi asimetrisi ve işaret vermenin sermaye yapısı kararlarına etkisi Myers ve Majluf (1984) tarafından incelenmiştir. Araştırmacılar hisse ihracının ancak hisselerin aşırı değer kazandığı düşünüldüğünde gerçekleşeceğini, bunu tahmin eden yatırımcının hisseye tahmin edilenin altında değer biçeceğini iddia ederek Finansal Hiyerarşi Teorisi olarak da adlandırılan aşağıdaki önermeleri geliştirmişlerdir:

1) Firmalar dış kaynaklar yerine özkaynakları tercih ederler
2) Temettülerden feragat ederek yatırım yapılması yatırımcı açısından tercih edilmez.
3) Eğer yatırım finansmanı için dış kaynak gerekiyor ise firmalar öncelikle dış borca başvururlar. Yeterli kaynak sağlanamazsa hisse senedi gibi daha riskli araçlara yönelirler.

Shyam-Sunder ve Myers (1999) sınırlı sayıda ve gelişmiş firmalardan oluşan bir veri setiyle ampirik olarak finansal hiyerarşi ve dengeleme teorilerini karşılatırmışlar, finansal hiyerarşi teorisinin daha doğru sonuçlar verdiğini göstermişlerdir. Frank ve Goyal (2003) daha geniş bir veri setiyle dış borcun hisse ihracına karşı daha fazla tercih edilmediğini göstermişlerdir. Araştırmacıların modeline göre, finansal hiyerarşi sadece büyük firmalar tarafından takip edilmektedir. Benzer çıkarımları elde eden Lemmon ve Zender (2010) bu durumun küçük firmaların dış borca olan sınırlı erişimden kaynaklandığını iddia etmişlerdir.

İki ana teori dışında son dönemde şirket kontrolü ile üretim stratejilerinin sermaye yapısına etkisini inceleyen çalışmalar da bulunmaktadır. Harris ve Raviv (1988), Stulz (1988) ve Israel (1991) şirket el değiştirmelerini göz önüne alan modeller geliştirmişlerdir. Bu modellerde yöneticilerin borç oranını muhtemel yönetim değişikliğinin mevcut yönetime azami katkı sağlayacağı düzeyde belirlediklerini önermişlerdir. Öte yandan Brander ve Lewis (1986) üretim stratejileri ile finansman stratejileri arasında ilişki olduğunu ortaya koymuşlardır. Araştırmacılar, firmaların üretim stratejilerini rakiplerini finansal zorluğa sokacak şekilde belirlediklerini iddia etmişlerdir.

BÖLÜM 3
SERMAYE YAPISINI ETKİLEYEN FAKTÖRLER

İkinci bölümde özetlenen teoriler sermaye yapısını etkileyen değişkenleri belirlemeye dönük deneysel çalışmalara yön vermiştir. Bu bölümde literatürde yaygın olarak incelenmiş olan sermaye yapısını etkileyen faktörler açıklanmıştır.

Teoride en fazla üzerinde durulan vergi konusu ampirik çalışmalarda da ön plana çıkmaktadır. Teoride fazlasıyla üzerinde durulmasına karşılık borçlanmanın getirdiği vergi avantajının hesabı kolay değildir. Ticari bir bilgi olması nedeniyle gerçekleşen firma ve yatırımcı vergi ödemelerini doğru bir şekilde elde etmek çoğu zaman güç olmaktadır. Bu nedenle ampirik çalışmalarda genellikle vergi oranı yerine amortisman ve vergi iadeleri gibi diğer vergi avantajlarının kullanılması tercih edilmiştir. Bunun nedeni bu tür vergi avantajlarının yüksek olması durumunda firmaların borcun getirdiği vergi avantajına daha az başvuracağı önermesidir.

Vergi oranları dışında ampirik çalışmalarda en çok incelenen firma bazlı değişkenler sabit varlık oranı, firma ölçeği, büyüme beklentisi, karlılık ve oynaklıktır. Titman ve Wessels (1988), Bennett ve Donnelly (1993), Panno (2003) sabit varlıkların borçlanma maliyetini düşüren bir faktör olduğu düşüncesiyle sabit varlıkların toplam varlıklara oranını çalışmalarında test etmişlerdir. Sözkonusu araştırmacılar yüksek oranda sabit varlıklara sahip firmaların sabit varlıkları borçlara karşı teminat göstererek daha kolay ve ucuz şekilde borçlanabileceği, bu yüzden de hisse ihracı yerine borcu tercih edeceği düşüncesiyle modellerinde sabit varlık oranı değişkenini test etmişlerdir.

Firma ölçeğinin etkisi çok net olmamakla birlikte, birçok araştırmacı tarafından modellerde test edilmiştir. Titman ve Wessels (1988) toplam satışın doğal logaritmasını firma ölçeğinin bir göstergesi olarak modellerinde kullanmışlardır. Sonuçlar büyük ölçekli firmaların borçlanma kapasitelerinin yüksekliği nedeniyle küçük ölçekli firmalara göre daha yüksek borç oranına sahip olabileceğini göstermiştir. Pano (2003) da büyük firmaların daha az risk taşıdığı, piyasalara daha rahat erişebildiği ve daha uygun oranlarda borçlanabildiği önermesiyle toplam varlıkların doğal logaritmasını ölçeğin göstergesi olarak modelinde kullanmıştır. Sonuçlar ölçeğin borç oranı üzerinde pozitif etkisi olduğunu göstermektedir. Toplam varlıklar yerine toplam satışları ölçeğin göstergesi olarak kullanan Köksal ve Orman (2014) da firma ölçeğinin borç oranları ile pozitif ilişkisi olduğunu göstermişlerdir.

Büyüme beklentisinin borç oranına olan etkisi konusunda ana teorilerin farklı argümanları mevcuttur. Dengeleme Teorisine göre borç kaynaklı vekalet maliyetleri büyüme beklentisi yüksek olan firmalarda daha fazladır. Bu nedenle yatırım fırsatı fazla olan firmaların borç oranı düşük olmalıdır. Finansal hiyerarşi teorisine göre ise büyüme

beklentisi yüksek olan firmaların dış finansman ihtiyacı yüksek olup borçlanma oranı da bu doğrultuda artacaktır. Özkan (2001), Frank ve Goyal (2009), Charalambakis ve Psychoyios (2012) toplam varlıkların piyasa değerinin muhasebe değerine oranını büyüme beklentisinin göstergesi olarak test etmişlerdir. Sonuçlar büyüme beklentisinin borçlanma üzerinde negatif etkisi olduğunu göstermektedir.

Firma karlılığının borçlanma üzerinde etkisi konusunda da ana teoriler farklı pozisyondadırlar. Dengeleme Teorisine göre iflas beklentisi karlılığı yüksek olan firmalarda düşük olacaktır. Bu doğrultuda karlılığı yüksek olan firmaların borç oranlarının yüksek olmasını beklemek gerekir. Buna karşılık finansal hiyerarşi teorisine göre firmalar dış kaynaklar yerine özkaynakları tercih edeceklerinden karlılığı yüksekse borç oranının düşük olması gerekir. Titman ve Wessels (1988) karlılığı işletme gelirinin toplam varlıklara oranı değişkeniyle modellerinde test etmişlerdir. Sonuçlar karlılığın borçlanma üzerinde negatif etkisi olduğunu göstermektedir. Allen ve Mizuno (1989) karlılığı faiz ve vergi öncesi karın toplam varlıklara oranıyla modellerine dahil etmişlerdir. Onların sonuçları da finansal hiyerarşi teorisini destekler mahiyette negatif bir ilişki ortaya koymaktadır.

Oynaklığın borçlanma üzerindeki etkisi konusunda her iki teori de negatif bir ilişki öngörmektedir. Bradley, Jarrell ve Kim (1984) oynaklığı yıllık karın yıllar arası değişiminin standart sapması olarak test etmişlerdir. Sonuçlar oynaklık arttıkça borçlanmanın azalacağını göstermiştir.

Bu faktörlerin yanısıra borç oranlarının sektörler arasında ciddi düzeyde farklılık gösterdiği bilinmektedir. Bradley, Jarrell ve Kim (1984) istatistiksel olarak kâğıt, tekstil, çelik üretimi ve havayolu sektöründe yer alan firmaların yüksek kaldıraç oranına sahip olduklarını göstermişlerdir. Sektörler arası farkı farklı argümanlarla açıklamak mümkündür. Bazı araştırmacılar sektör ortalamasını firmaların hedef kaldıraç oranı olarak algıladıklarını belirtmişlerdir. Başka bir argümana göre ise aynı sektörde yer alan firmalar borçlanma kararlarını etkileyen benzer faktörlere maruz kalmaktadırlar. Sektörler arası kaldıraç kullanımının farkı ampirik çalışmalarda kukla değişkenlerle ölçülmektedir. Talberg, Winge, Frydenberg ve Westgaard (2008) çalışmalarında kukla değişken katsayılarını anlamlı bulmuşlardır. Bununla birlikte araştırmacılar katsayıların ifade ettiği anlamı yorumlamanın zor olduğunu belirtmişlerdir.

BÖLÜM 4

SERMAYE YAPISI KARARLARININ ÜLKELER ARASI KARŞILAŞTIRMASI

Bugüne kadar yapılan ampirik çalışmalar sermaye yapısını etkileyen faktörler hakkında gelişmiş ülke firmalarına dönük önemli bulgular ortaya koymuşlardır. Firma düzeyinde elde edilen sonuçların arasındaki çelişkiler makro düzeyde sermaye yapısını etkileyen faktörlerin olabileceği düşüncesini desteklemektedir. Son yıllarda gelişmekte olan ülkelere ait güvenilir verilerin oluşmasıyla araştırmacılar makro düzeyde yeni değişkenlerin etkisini test edebilmişler, ülkeler arası kıyaslama yapabilmişlerdir. Bu bölümde bu çalışmaların bazıları hakkında özet bilgi verilecektir.

Rajan ve Zingales (1995) G-7 ülkelerinde sermaye yapısı kararlarını etkileyen faktörleri incelemişlerdir. Araştırmacıların amacı ABD firmalarının borçluluk oranlarını etkileyen faktörlerin diğer ülke firmalarının sermaye yapılarını da benzer şekilde etkileyip etkilemediğini ölçmek olmuştur. Ülkeleri vergi rejimleri, iflas mevzuatı, piyasaların gelişmişliği, şirketlerin ortaklık yapısı gibi hususlarda kıyaslayarak borçluluk oranlarındaki farklılaşmanın bu tür değişkenlerle ne kadar açıklanabileceğini test eden Rajan ve Zingales (1995) anlamlı sonuçlara ulaşamamışlardır. Firma düzeyindeki değişkenlerin ise anlamlılık düzeyleri değişmekle birlikte diğer ülkelerde de borç oranları üzerinde etkili olduğu ampirik olarak desteklenmiştir.

La Porta, Lopez-De-Silanes, Shleifer ve Vishny (1997) dış finansman kullanımı ile hukuki faktörlerin etkileşimini incelemişlerdir. Araştırmacılar yatırımcıların haklarını düzenleyen mevzuatın ve bunların uygulamasına dönük müeyyidelerin değişik hukuk sistemlerinde farklılık gösterdiğini belirtmişlerdir. Bu doğrultuda 49 ülkeyi hukuki sistemleri açısından İngiliz, Fransız, Alman ve İskandinav sistemleri olmak üzere dört gruba ayırmışlar, kullandıkları kukla değişkenlerle kaldıraç kullanımının hukuki sistemlere göre farklılaşabileceği hipotezini test etmişlerdir. Sonuçlar hukuki sistemlerin borç kullanma üzerinde anlamlı bir etkisi olmadığını gösterse de, ülkelerin bankacılık ve

sermaye piyasalarının gelişmişliğinin hukuki sistemlerle doğrudan ilişkisi olabileceğini ortaya koymuştur.

Booth, Aivazian, Demirgüç-Kunt ve Maksimovic (2001) Hindistan, Pakistan, Tayland, Malezya, Türkiye, Zimbabve, Meksika, Brezilya, Ürdün ve Güney Kore'deki firmaların sermaye yapısı tercihlerini incelemişlerdir. Ülkeleri makroekonomik koşullarıyla firma borçluluk oranları açısından kıyaslayan araştırmacılar toplam borçluluk oranları ile uzun vadeli borçlanma oranları arasındaki farkın gelişmekte olan ülkelerde daha fazla olduğunu göstermişlerdir. Reel ekonomik büyümenin borçlanmayı artırdığını, enflasyonun ise azalttığını istatistiksel olarak gösteren araştırmacılar ayrıca vergi avantajının daha fazla olduğu ülkelerde ortalama borçlanma oranının arttığı sonucuna ulaşmışlardır. Ülkeleri ayrı ayrı ve toplu halde firma düzeyindeki değişkenler açısından da analiz eden araştırmacılar kaldıraç oranını karlılık ve ortalama vergi oranının negatif, firma ölçeğinin ise pozitif olarak etkilediğini göstermişlerdir.

Antoniou, Güney ve Paudyal (2008) ülkelerin piyasalarının eğilimlerinin sermaye yapısı üzerine etkisini incelemişlerdir. Ülkelerin mali piyasalarının bankacılık veya menkul kıymetler piyasalarından birini daha fazla ortaya koyabileceğini belirten araştırmacılar Fransa, Almanya ve Japonya'yı bankacılığı, ABD ve İngiltere'yi ise menkul kıymetler piyasalarını daha fazla teşvik ettiği argümanıyla sözkonusu ülkelerdeki sermaye yapısı tercihlerini analiz etmişlerdir. Modelde kullanılan firma bazlı değişkenler karlılık, büyüme beklentisi, sabit varlık oranı, vergi oranı, temettü oranı ve borçlanma dışı vergi muafiyetleridir. Panel veri kullanılarak yapılan analizler sonucunda karlılık, büyüme beklentisi ve vergi oranı arttıkça kaldıraç oranının azaldığı görülmüştür. Borçlanma dışı vergi muafiyetlerinin etkisi beklenildiği gibi pozitif ve anlamlıdır. Bu 5 ülkede temettü politikalarının borçlanma politikaları üzerinde etkisi olmadığı sonucu elde edilmiştir. Ayrıca kullanılan ülke kukla değişkenlerinin anlamlı çıkması kaldıraç oranını etkileyen ve modelde öngörülemeyen ülkelere özgü bir takım faktörlerin varlığını göstermiştir.

Antoniou, Güney ve Paudyal (2008) ayrıca ülkelerdeki kanun gücü, ortaklık yapısı, alacaklı hakları ve yönetici-şirket sahibi ilişkilerini düzenleyen yasaların finansman tercihi üzerindeki etkilerini de incelemişlerdir. Kanuni müeyyidelerin etkisi borçlanma üzerinde negatiftir. Araştırmacılar, bu sonucun iflas kanunlarının etkililiğinin firmaları borç

kullanmadan uzaklaştırması nedeniyle ortaya çıktığı yorumunu yapmışlardır. Araştırmacıların bulguları ayrıca mülkiyetin az sayıda ortakta toplandığı firmaların daha fazla borç tercih edeceğini, alacaklı haklarının güçlü olduğu ülkelerde ise borçlanmanın kolaylaşması nedeniyle borç oranının artacağını göstermiştir.

Lopez-Iturriaga ve Rodriguez-Sanz (2008) ülkelerin hukuki sistemlerinin menşeinin finansal piyasalardaki ilişkileri yönlendirebileceği hipotezini test etmişlerdir. Seçtikleri 10 ülkenin üç farklı hukuk sisteminden birine ait olduğunu kabul ederek sermaye yapılarının hukuki sisteme göre değişim gösterip göstermediğini analiz etmişlerdir. Araştırmacılar Anglo-sakson hukuk anlayışına sahip ülkelerin uzun vadeli borcu tercih ettiklerini, Alman tarzı hukuki sistemi benimseyen ülkelerin en düşük uzun vadeli borç oranına sahip olduğunu göstermişlerdir. Firma düzeyindeki parametrelerin borç oranları üzerinde etkilerini de inceleyen araştırmacılar hukuki sistemlerin finansman kararlarını doğrudan etkilemek yerine firma davranışlarını etkileyerek dolaylı yoldan etki gösterdiklerini önermişlerdir.

Jong, Kabir ve Nguyen (2008) ülkelere özgü faktörlerin dolaylı ve doğrudan etkilerini incelemişlerdir. Araştırmacılar makro düzeydeki etkenlerin firma değişkenlerini etkileyerek dolaylı olarak kaldıraç oranlarını etkilediğini önermişlerdir. Firma düzeyindeki değişkenlerin piyasaların gelişmişliği, müeyyidelerin uygulama gücü, GSYİH gibi değişkenlerden ne kadar etkilendiğini inceleyen araştırmacılar, hisse senedi piyasalarının gelişmişliğinin sabit sermaye oranının etkisi üzerinde negatif etki yaptığını elde etmişlerdir. Ayrıca firma ölçeğinin etkisinin müeyyidelerin uygulama gücü arttıkça azaldığı sonucu testler sonunda ortaya çıkmıştır.

Kayo ve Kimura (2011) sermaye yapısını etkileyen faktörleri üç düzeyde ele almışlardır: 1) zaman 2) firma 3) sektör/ülke. 40 ülkenin firmalarının 1997-2007 yıllarına ait verilerini kullanan araştırmacılar değişirlik ayrıştırması metoduyla her bir düzeyin sermaye yapısı üzerindeki etkisini incelemiştir. Sonuçları firma düzeyindeki değişkenlerin borç oranının değişiminin yüzde 42,5'inden sorumlu olduğunu göstermiştir. Zamana bağlı değişim yüzde 35,6 olarak ölçülürken sektör ve ülke düzeyi faktörler sırasıyla yüzde 11,6 ve 3,3 düzeyindeki değişime sebep olmuşlardır. Bu sonucun sektör ve ülke faktörlerinin değişiminin uzun vadeye yaygın olmasından kaynaklandığını ifade eden araştırmacılar, bu

sonuçlara bakılarak makro düzeydeki faktörlerin ihmal edilmesinin doğru olmadığını savunmuşlardır.

Fan, Titman ve Twite (2012) yapısal farklılıkların sermaye yapısını nasıl etkileyebileceğini incelemişlerdir. 39 ülkeye ait firma verilerinin yanı sıra vergi uygulamaları, hukuki müeyyideler, yolsuzluklar, makroekonomik değişkenler ve finansman kuruluşlarına ilişkin düzenlemeleri modellerine dâhil eden araştırmacılar kaldıracın enflasyona duyarlı olmadığını ve ekonomik büyümeyle pozitif ilişkisi olduğunu elde etmişlerdir. Regresyon sonuçları yolsuzluğun yüksek borç oranlarıyla, Anglo-sakson hukukun ise düşük borç oranlarıyla ilişkili olduğunu göstermiştir. Araştırmacılar ayrıca borçtan kaynaklanan vergi muafiyetinin yüksek olduğu ülkelerde borç oranlarının yüksek olduğunu tespit etmişlerdir. Buna karşılık kaldıraç oranlarının bankacılık sektörünün büyüklüğü, sigorta endüstrisinin derinliği, yurtiçi tasarrufların büyüklüğü ve bono piyasalarının gelişmişliğinden bağımsız olduğunu test sonuçları göstermiştir.

Dengeleme teorisinin dinamik olarak modellendiği çalışmalar uluslararası düzeyde de yapılmıştır. Bunlardan Antoniou, Guney ve Paudyal (2008) hedef kaldıraç oranına erişim hızını etkileyen faktörleri ABD, İngiltere, Fransa, Almanya ve Japonya için test etmiştir. Sonuçlar firmaların bir hedef orana zaman içerisinde ulaştığını doğrulamaktadır. Hedef borç oranına ulaşma hızı en yüksekten en düşüğe olmak üzere Fransa, ABD, İngiltere, Almanya ve Japonya'ya aittir. Araştırmacılar hızı belirleyen faktörlerin işlem maliyeti ile hedef kaldıraç oranından uzakta olmanın getirdiği maliyetler olduğunu belirtmişler, sözkonusu maliyetlerin ise ülkelerin finansal sistemleri ile şirket idare geleneklerine bağlı olduğunu ifade etmişlerdir.

Oztekin ve Flanney (2012) ülkelere ait niteliklerin hedefe ulaşma hızını nasıl etkileyebileceklerini incelemişlerdir. 37 ülkeye ait firma verileri ile makro verileri modellerinde test eden araştırmacılar, işlem maliyetindeki artışın hedefe ulaşma hızını yüzde 3 ila 9 orasında azalttığını tespit etmişlerdir. Araştırmacılar ayrıca ülkelerin hukuki ve kurumsal yapılarının etkilerini de incelemişlerdir. Sermaye piyasalarına erişim kolaylığının hızı artırdığını, bilgi asimetrisindeki artışın ise hızı yavaşlattığını göstermişlerdir.

Cotei, Farhat ve Abugri (2011) 23 gelişmiş 14 gelişmekte olan ülkeye ait firmaların kaldıraç hedefine erişim hızlarını etkileyen faktörleri test etmişlerdir. Sonuçlar Anglo-sakson hukukunu benimseyen ülkelerin erişim hızının kıta Avrupa'sına göre daha fazla olduğunu ortaya koymuştur.

BÖLÜM 5
VERİ VE ANALİZ METODU

Bu bölümde modelde kullanılan değişkenler, kullanılan örnekleme ait özellikler ile analiz yöntemi hakkında bilgi verilmiştir.

Firmalara ait veriler Thomson Reuters Datastream veri tabanından elde edilmiştir. Literatürde sıkça test edilmiş olan sabit varlık oranı, ölçek, büyüme beklentisi, karlılık ve likidite değişkenleri sözkonusu veri tabanında yer alan firma bilanço ve nakit akışı tablolarındaki veriler kullanılarak elde edilmiştir. Sabit varlık oranı (TANG) net sabit varlıkların toplam varlıklara bölünmesiyle elde edilmiştir. Ölçek (SIZE) firmaların toplam yıllık satış rakamlarının doğal logaritması olarak alınmıştır. Büyüme beklentisi (GROWOPP) toplam varlıkların piyasa değerinin muhasebe değerine bölünmesiyle hesaplanmıştır. Karlılık (PROF) vergi ve faiz öncesi kazancın toplam varlığa bölünmesiyle elde edilmiştir. Likidite (LIQ) ise cari varlıkların toplam varlıklara bölünmesiyle elde edilmiştir. Bu çalışmada vergi oranı (TAX) her bir firmanın analiz dönemi boyunca ödediği toplam verginin toplam vergi öncesi gelirine bölünmesiyle hesaplanmıştır. Bağımlı değişken olan kaldıraç oranı (MVLTD) uzun vadeli borçların toplam varlıkların piyasa değerine bölünmesiyle elde edilmiştir.

Datastream firmaları FTSE'nin Industry Classification Benchmark (ICB) kriterlerine göre sınıflandırmaktadır. Bu çalışmada sektör düzeyi olarak adlandırılan 4'üncü düzey dikkate alınarak kukla değişkenlerin kullanılması yoluyla firmaların sektörleri analize dahil edilmiştir. Dağıtım firmaları ve finans sektöründe işlem gören firmalar sermaye yapıları açısından yasal düzenlemelere uymak zorunda olduklarından bu çalışmaya dâhil edilmemişlerdir.

Ülkelere özgü değişkenler üç başlık altında dikkate alınmıştır. Dünya Bankasına ait veri tabanından elde edilen mali piyasaların gelişmişliğine dair değişkenler banka yoğunluğu (BC), banka aktif karlılık oranı (BROA), sermaye piyasası büyüklüğünün GSYİH'ye oranı (SMC), banka sermaye oranı (BCA), reel faiz oranı (RIR), kredi veri derinliği endeksi (CDII) ve yasal hakların etkinliği endeksidir (SLRI). BC bir ülkedeki en büyük 3 bankaya ait toplam varlıkların ticari bankalara ait toplam varlıklara oranıdır. BROA bankalara ait net karın toplam varlıklara bölünmesiyle elde edilir. SMC borsada kote olan payların toplam piyasa değerinin GSYİH'ye bölünmesiyle elde edilir. BCA bankaların toplam sermaye ve rezervlerinin toplam varlıklarına bölümüdür. CDII 0 ile 6 arasında değişen bir endekstir. Yüksek olması kredi kayıt sisteminin etkinliğini gösterir. SLRI endeksi 0 ila 10 arasında değişir. Ülkedeki borçlanma ve iflasa dönük yasal altyapının gücünü ve etkinliğini belirtir.

Makro ekonomik koşullara ait değişkenler kişi başına GSYİH (GDP), enflasyon oranı (INF) ve nakit fazla/açığının GSYİH'ye oranıdır (CSD). İş ortamına ilişkin değişkenler ise ticari şeffaflık endeksi (BEDI) ve iflas çözülme süresi (TRI)'dir. BEDI 0 ila 10 arasında değişen, yüksek olması mülkiyet ve mali bilgilere ait şeffaflığın arttığını gösteren endekstir. TRI iflas davasının açılmasından yükümlülüklerin karşılanıp davanın kapanmasına kadar geçen ortalama yıl sayısıdır.

Bu çalışmada seçilen ülkeler Birleşmiş Milletlerin sınıflandırmasına göre 4 grupta yer almaktadır:

1. ABD ve Batı Avrupa: ABD, İngiltere, Fransa, Almanya
2. Asya-Pasifik: Japonya, Malezya, Endonezya
3. Latin Amerika: Brezilya, Meksika, Şili
4. Ortadoğu ve Kuzey Afrika: Türkiye, S.Arabistan, Mısır, Ürdün

Bütün ülkeler için Datastream'de yer alan güvenilirliği yüksek olarak derecelendirilmiş borsada kote firmalar belirlenmiştir. 1995-2012 yıllarına ait veriler veri tabanından çekilmiştir. Gelişmekte olan ülke verilerinin kısıtı nedeniyle analiz dönemi 2001-2011 olarak belirlenmiştir. İngiltere, ABD, Fransa, Almanya, Japonya, Malezya, Endonezya, Brezilya, Meksika, Şili, Türkiye, S.Arabistan, Mısır ve Ürdün'e ait sırasıyla 104, 106, 88, 98, 96, 85, 81, 79, 66, 72, 112, 50, 52 ve 58 firma örnekleme dâhil edilmiştir.

Araştırmada panel veri kullanılmıştır. Modelde kullanılan firma düzeyi değişkenler ile gözlemlenemeyen firmaya ait bazı nitelikler (işletme kültürü, idari özellikler gibi) arasında olabilecek ilişki göz önünde bulundurularak panel veri yöntemlerinden sabit etkiler modeli kullanılmıştır. Bu yöntemle elde edilen sonuçlar istatistiksel olarak güvenilir olsa da zaman içerisinde değişkenlik göstermeyen değişkenlerin etkilerini göstermemektedir. Bu amaçla Hausman-Taylor (1981) tarafından geliştirilen yöntem kullanılılarak sektör değişkenleri ve endeksler gibi zamanda sabit olan değişkenlerin kaldıraç üzerindeki etkileri incelenmiştir.

Finansal piyasalara ilişkin değişkenler (BC, BROA, SMC, BCAR, RIR) ile makroekonomik koşullara ilişkin değişkenler (GDP, INF, CSD) arasında yüksek korelasyon bulunmaktadır. Bu nedenle bu değişkenlerin birlikte aynı modelde analiz edilmesi değişkenlerin anlamlılık düzeylerini düşürmektedir. Tezin amacı ülkeler arasında kaldıraç oranının belirlenmesinde etken olan değişkenlerin karşılaştırmasını yapmak olduğundan analiz her bir grup için ayrı ayrı gerçekleştirilmiştir.

BÖLÜM 6

TEST SONUÇLARI

STATA 12.0 yazılım paketi kullanılarak panel veri sabit etkiler ve Hausman-Taylor modelleriyle analiz edilmiştir. Öncelikle her ülke tek tek analiz edilmiştir. Daha sonrasında bütün ülkelerin verileri birleştirilerek analiz tek bir örneklem için tekrarlanmıştır.

Analiz öncesinde bütün ülkelere ait veriler karşılaştırılmıştır. Ülkelerin ortalama uzun vadeli borç oranı yüzde 5 ila 15 arasında değişmektedir. En yüksek kaldıraç ABD, Meksika, Brezilya, Japonya ve Endonezya'da görülmüştür. En düşük borç oranları ise Ürdün, Mısır ve Türkiye'dedir. Ülkelerin ortalama firma büyüklükleri göz önüne alındığında en düşük kaldıraç oranlarına sahip olan Ürdün, Mısır ve Türkiye'nin en düşük firma ölçeklerine sahip oldukları görülmektedir. Aynı şekilde ABD, Meksika, Japonya ve Endonezya yüksek kaldıraç oranlarının yanısıra ortalama olarak en büyük ölçekli firmalara sahiptirler. En yüksek vergi oranlarına sahip dört ülke yine yüksek kaldıraç oranlarına sahip olan ABD, Meksika, Japonya ve Endonezya'dır.

Ülkelerin koşulları ile kaldıraç ilişkisi de ortalama değerler üzerinden gözlemlendiğinde anlamlı sonuçlar elde edilmektedir. Türkiye ve Ürdün gibi bankacılık sisteminin az sayıda banka üzerinde toplandığı ülkelerde kaldıraç oranı düşükken bankacılığın yaygın olduğu ABD, Endonezya ve Japonya yüksek kaldıraç oranlarına sahiptir. Ülkelerin ortalama değerlerine bakıldığında ayrıca banka sermaye rasyosu yüksek olan ülkelerde kaldıraç oranlarının düşük olduğu görülmektedir. CDII endeksi kredi kayıt sisteminin etkin olduğu ABD, Japonya ve Meksika'da kaldıraç oranının da ortalama olarak yükseldiğini göstermektedir. Hukuki müeyyidelerin etkinliğini gösteren SLRI endeksinin yüksek olduğu ülkelerde de kaldıraç oranları artmaktadır. Veri seti ayrıca GSYİH ile kaldıraç oranları arasında negatif ilişki olduğunu göstermektedir.

Analizin ilk bölümünde ülkeler ayrı ayrı sabit etkiler ve Hausman-Taylor yöntemleriyle analiz edilmiştir. Sabit etkiler modelinde ilk aşamada firmaya özgü değişkenler test edilmiştir. İkinci aşamada ilk aşamada kullanılan değişkenlere makroekonomik koşul değişkenleri eklenmiş, üçüncü aşamada ise firma bazlı değişkenler ile finansal piyasalara dair değişkenlerin kaldıraç üzerine etkisi test edilmiştir. İlk aşamanın sonuçlarına göre İngiltere, Fransa, Almanya, Japonya, Malezya, Endonezya, Şili ve Türkiye için TANG değişkeni katsayısı pozitif ve yüzde 5 düzeyinde anlamlı çıkmıştır. Özellikle Asya-Pasifik ülkelerinde TANG değişkeni yüzde 1 düzeyinde dahi anlamlıdır. Kaldıraç ile sabit varlıklar arasındaki pozitif ilişki sabit varlıkların ipotek olarak kullanılma kolaylığı nedeniyle beklenen bir durumdur. ABD firmaları için ise sabit varlıkların kaldıraç üzerinde herhangi bir etkisi bulunmamaktadır. SIZE değişkeni katsayısı İngiltere, Fransa, Almanya, Malezya, Meksika ve S.Arabistan firmaları için pozitif ve yüzde 5 seviyesinde anlamlıdır. Buna karşılık sözkonusu katsayı ABD, Endonezya ve Brezilya'da negatif ve yüzde 5 düzeyinde anlamlıdır. Pozitif işaretli ülkelerde bu durum dengeleme teorisini destekler şekilde büyük firmaların iflas riskinin düşük olması ve böylece daha yüksek borçlanma kapasitesine sahip olmasına göstergedir. Negatif işaretli ülkelerde ise bu durum finansal hiyerarşi modelini destekler mahiyette büyük firmaların daha şeffaf olması nedeniyle bilgi asimetrisinden minimum düzeyde etkilendiğini göstermektedir. GROWOPP değişkeninin katsayısı negatif ve S.Arabistan, Mısır ve Ürdün dışında bütün ülkeler için anlamlıdır. Bu sonuç borcun disipline edici rolünü vurgulayan dengeleme teorisini desteklemektedir. Test sonuçlarına göre yüksek büyüme beklentisinde olan

firmalar daha az borçlanmayı tercih etmektedirler. Karlılık değişkeni katsayısı da İngiltere, ABD, Fransa, Almanya, Japonya, S.Arabistan, Mısır ve Ürdün için negatif ve anlamlıdır. Bu durum finansal hiyerarşi teorisini desteklemektedir. Zira karlı firmalar borcu daha az oranda tercih etmektedirler.

İkinci aşama analizde makroekonomik koşullara dair değişkenlerin eklenmesi firma değişkenlerinin katsayılarında büyüklük ve istatistiksel anlam açısından değişime sebebiyet vermemiştir. Enflasyon katsayısı sadece 3 ülkede (Fransa, Brezilya ve Almanya) pozitif ve anlamlıdır. Enflasyonun negatif ve anlamlı etkiye sahip olduğu tek ülke ise Japonya'dır. Ülkelerin tek tek analizi enflasyonun etkisini ölçme açısından yeterli bulunmamaktadır. GSYİH ise İngiltere, ABD, Fransa, Almanya, Japonya, Endonezya ve Türkiye'de kaldıraç üzerinde negatif ve anlamlı etkiye sahiptir. Bu ülkelerde ekonomi büyüdükçe firmalar kaldıraç oranlarını düşürmektedirler. Nakit fazla/açığının etkisi incelendiğinde ise anlamlı bir ilişki ortaya çıkmamaktadır.

Üçüncü aşamada finansal piyasalara dair değişkenler eklendiğinde de firma değişkenlerinin katsayılarında değişiklik olmamaktadır. Sonuçlar kaldıraç oranı ile banka sermaye rasyoları arasında anlamlı bir ilişki göstermemektedir. ABD, Fransa, Almanya, Brezilya ve Şili'de banka aktif karlılığının etkisi negatif ve yüzde 5 düzeyinde anlamlıdır. Etkinin negatif olması bankaların kar iştahının firmaların borç talebi üzerinde negatif etkisi olduğuna işarettir. Hisse senedi piyasasının gelişmişliğini gösteren değişken SMC'nin katsayısı İngiltere, Fransa, Japonya, Endonezya ve Türkiye için negatif ve anlamlıdır. Bu sonuç sermaye piyasaları genişledikçe firmaların daha kolay hisse senedi ihraç edeceği, borca daha az oranda başvuracağı argümanıyla uyumludur.

Sabit etkiler yönteminin ardından aynı veri seti Hausman-Taylor modeli ile test edilmiştir. Hausman-Taylor yaklaşımı sektör kukla değişkenleri ile vergi değişkeninin modele eklenmesine imkân sağlamıştır. 31 sektör petrol ve doğalgaz üretimi baz alınacak şekilde 30 kukla değişkenle modele dahil edilmiştir. Hausman-Taylor modelinin bir koşulu olarak firma değişkenlerinin içsel değişkenler olduğu varsayılmıştır. Hem makroekonomik koşul değişkenleri hem de finansal piyasa değişkenleri ile yapılan analizlerde firma değişkeni katsayıları sabit etkiler yöntemi sonuçlarıyla benzerlik göstermiştir. Bu durum yapılan içsellik varsayımının doğruluğuna işaret olarak yorumlanmıştır. Makroekonomik koşullar ve finansal piyasa değişkenleri ile yapılan analizlerde vergi değişkeninin katsayısı

ABD ve Meksika'da pozitif ve anlamlı çıkmıştır. Sektör kukla değişken katsayıları ise İngiltere, Fransa ve Malezya'da çoğunlukla anlamlıdır.

Zaman içerisinde değişim göstermeyen CDII, SLRI, BEDI ve TRI değişkenlerinin kaldıraç üzerindeki etkisini test edebilmek için Şili dışındaki bütün ülkelere ait veriler birleştirilerek analiz edilmiştir. Benzer şekilde bütün veri havuzu Hausman-Taylor yöntemiyle makroekonomik koşullar ve finansal piyasalar değişkenleri ile ayrı ayrı test edilmiştir. Vergi değişkeni TAX'ın yanı sıra KPMG tarafından sunulan ülke ortalama kurumlar vergisi rakamı da ayrıca CORTAX değişkeniyle modelde test edilmiştir. Sonuçlar CORTAX değişkeni katsayısının makroekonomik koşul değişkenleri ile yapılan analizlerde yüzde 5 düzeyinde, finansal piyasa değişkenleriyle yapılan analizde yüzde 10 düzeyinde anlamlı olduğunu göstermiştir.

TAX değişkeniyle yapılan analizlerde enflasyonun kaldıraç üzerindeki etkisi pozitif, GSYİH'nın ise negatif olmaktadır. Bu sonuçlara göre enflasyon yükseldiğinde firmaların karlılığı reel olarak düşmektedir. Karlılık düşünce firmalar borçlanmaya yönelmektedirler. Aynı şekilde ekonomi büyüdüğünde firmaların gelirleri artmakta, borçlanma ihtiyaçları azalmaktadır. Test sonuçlarına göre banka sermaye rasyoları arttıkça firma borç oranları azalmaktadır. Ülkelerin Merkez Bankaları banka sermaye oranlarını artırdıkça firmalara uygun koşullarda sunulabilecek borç miktarını kısıtlamaktadırlar. Bu da firmaların kaldıraç oranlarına yansıyabilmektedir. Toplu verilerin analizi BC değişkenini negatif ve anlamlı kılmıştır. Bu sonuç bankacılık sisteminin az sayıda bankada toplanmasının erişilebilirliği azalttığı ve borçlanma oranlarını düşürdüğü argümanını desteklemektedir. Finansal piyasalara dair bütün değişkenlerin anlamlı olması finansman kararlarının finansal piyasaların niteliklerinden bağımsız olmadığını göstermektedir.

Verilerin birleştirilmesi 3 endeksin modele katılmasına olanak tanımaktadır. Hausman-Taylor yöntemiyle gerçekleştirilen analizler 3 endeks için de anlamlı sonuçlar vermektedir. Kredi izlemenin etkinliğini ölçen CDII endeksinin kaldıraç üzerindeki etkisi negatiftir. Firmaların kredi geçmişi etkili bir şekilde izlendiği takdirde firmalar kredi kullanımında daha dikkatli olmaktadırlar. Hisse senedi piyasasının şeffaflığı ile ilgili BEDI endeksinin kaldıraç üzerindeki etkisi negatiftir. Firmalar finansal pozisyonlarıyla ilgili verileri daha şeffaf bir şekilde paylaştıkları zaman bilgi asimetrisi azalmakta, hisse senedi ihracı ile finansman nispi olarak artabilmektedir. İflas ve alacaklı haklarını düzenleyen

mevzuatın etkinliğini ölçen SLRI endeksi yükseldiğinde kaldıraç oranı da yükselmektedir. Borçlu alacaklı ilişkisini düzenleyen hukuki altyapının güçlü olması borçlanma maliyetini düşürerek firmaların borç kullanımını artırmaktadır. Aynı şekilde test sonuçlarının TRI değişkeni katsayısının negatif ve anlamlı olduğu göstermesi de iflas sürecinin kısalmasının borç alıp vermeyi kolaylaştırdığını ortaya koymaktadır.

Sektör değişkenlerinin büyük çoğunluğu anlamlı çıkmaktadır. Buna karşılık anlamlı olmayan sektör katsayıları örneklemde farklı sektörlere ait daha fazla firmaya ihtiyaç olduğunu göstermektedir. Ayrıca katsayılar büyük oranda yapılan sınıflandırmaya bağlı olup farklı sınıflandırmada sonuçların farklı olacağı düşünülmektedir. Yine de sonuçlar firma kaldıraç oranının tahmininde firmanın bulunduğu sektörün belirleyici olduğu görüşünü desteklemektedir.

Analiz ülke kukla değişkenleri eklenerek tekrarlanmıştır. 13 ülke için ABD baz olacak şekilde 12 kukla değişken modele eklenmiştir. Ülke kukla değişkenleri ile tekrarlanan analizde CDII, SLRI, BEDI ve TRI değişkenlerinin anlamlılığı korelasyon nedeniyle düşmektedir. Ülke kukla değişkenlerinden Almanya, Fransa, Japonya, Meksika ve Mısır finansal piyasa değişkenleri kullanıldığında anlamlı olmaktadırlar. Makroekonomik koşul değişkenleri kullanıldığında ise Endonezya, Japonya, Malezya ve Mısır değişkenleri anlamlı olmaktadırlar. Bölge kukla değişkenlerinin de model üzerinde benzer etkileri olmaktadır. Bölge değişkenleri bazı ülke düzeyi değişkenlerinin anlamlılığını azaltabilmektedir. Bölge kukla değişkenlerinden MENA ve Asya-Pasifik hem makroekonomik koşullar hem de finansal piyasalara ilişkin değişkenlerle analiz edildiğinde anlamlı katsayılara sahip olmaktadırlar.

Toplu veri TAX yerine CORTAX değişkeni kullanılarak analiz edildiğinde sonuçlar anlamlı çıkmaktadır. Vergi oranı arttıkça firmaların borçlanma oranlarını yükselttikleri görülmektedir. Bu sonuç dengeleme teorisiyle uyuşmaktadır. Sonuçlar vergi oranları adına beklenen anlamlı sonuçları verse de gerek makroekonomik koşullara gerekse finansal piyasalara dair değişkenlerin anlamlılıklarında düşüş gözlemlenmiştir. Bunun nedeni bu değişkenlerin CORTAX değişkeniyle korelasyonlarından kaynaklanabileceği düşünülmektedir. CORTAX ülke için ortalama bir oranı simgelediğinden vergi politikalarından bağımsız olamayacak makroekonomik ve finansal koşullara dair

değişkenler sözkonusu değişkenle ilişkili olabilecektir. CORTAX kullanıldığında ülke ve bölge kukla değişkenlerinin anlamlılığında ise artış gözlemlenmektedir.

Bölge kukla değişkenlerinin anlamlı olması bölgelerin ayrı ayrı analiz edilmesinden anlamlı sonuçları çıkacağı düşüncesini desteklemiştir. Bu yüzden her bir bölge kendi içinde tekrar analiz edilmiştir. Türkiye her ne kadar kurumsal anlamda Avrupa ile daha ilişkili görülse de ülke analizlerindeki sonuçlar dikkate alınarak Ortadoğu-Kuzey Afrika bölgesine dâhil edilmiştir. Bölge analizlerinde enflasyon Latin Amerika ve Batı Avrupa'da pozitif, Asya-Pasifik bölgesinde negatif etkiye sahiptir. GSYİH katsayısı Batı Avrupa, Ortadoğu-Kuzey Afrika ve Asya-Pasifik bölgesinde negatif ve anlamlıdır. Finansal piyasa değişkenlerinden banka sermaye rasyosunun kaldıraç üzerindeki etkisi negatif ve sadece Asya-Pasifik bölgesinde anlamlıdır. Banka aktif karlılığı Latin Amerika'da negatif, Asya-Pasifik bölgesinde pozitif etkiye sahiptir. Hisse senedi piyasasının büyüklüğü Latin Amerika dışındaki bütün bölgelerde negatif etkiye sahiptir.

BÖLÜM 7
SONUÇ

Ülke, bölge ve bütün örneklem üzerinden yapılan analizler seçilen firma düzeyi değişkenlerin teorik çerçeveye uygun anlamlı değişkenler olduklarını ortaya koymuştur. Gelişmekte olan ülkelerin tek başına analizlerinde dahi firma düzeyi değişkenler istatistiksel olarak anlamlı sonuçlar vermişlerdir. Sabit varlık oranı ve firma büyüklüğüne ait katsayıların işaretleri dengeleme modelini doğrularken karlılık katsayısı finansal hiyerarşi modelini doğrulamıştır. TAX değişkeni kullanıldığında anlamlı katsayılar elde edilememiştir. Buna karşılık CORTAX değişkeni dengeleme teorisini doğrulayacak şekilde anlamlı katsayılara sahiptir. Sektör kukla değişkenlerinin büyük oranda anlamla katsayılara sahip olması sektörün kaldıraç oranı açısından belirleyici olduğunu göstermiştir. Bu çalışma ile literatürde ilk defa kullanılan CDII, BEDI, SLRI endeksleri ve TRI değişkeni toplu veri ile analiz edildiğinde anlamlı katsayılara sahip olmuşlardır.

Kullanılan ülke düzeyi değişkenlerinin dışında gözlemlenmemiş ülke düzeyi değişkenler olabilir düşüncesiyle ülke kukla değişkenleri modele eklenerek analiz tekrarlanmıştır. Az sayıda ülke değişkeninin anlamlı çıkması kullanılan ülke düzeyi değişkenlerinin yeteri kadar açıklayıcı ve kapsayıcı olduğu sonucunu desteklemektedir.

ABD dışındaki dört grup ülke için ayrıca bölge kukla değişkeni kullanılmıştır. Bu değişkenlerin anlamlı katsayılara sahip olması modelde kapsanmamış bölgelere has bazı özelliklerin olabileceği düşüncesini doğurmuştur. Bu doğrultuda dört bölge ayrı olarak analiz edilmiştir.

Önceki araştırmalar içsellik problemini sabit etkiler yöntemiyle ve panel veri kullanarak aşmaya çalışmışlardır. Bu yöntem firma ve ülke düzeyinde zamanda sabit değişkenlerin ihmal edilmesi sonucunu doğurmuştur. Bu çalışmada Hausman-Taylor yöntemi kullanılarak anlamlı ve teoriyle uyumlu sonuçlar elde edilmiştir. Sonuçlar firmaların finansman kararlarının bankacılık sisteminin özellikleri ve hisse senedi piyasasının büyüklüğü ile yakından ilişkili olduğunu ortaya koymuştur. Ayrıca iyi işleyen bir hukuk sisteminin ve artan firma şeffaflığının borçlanmayı kolaylaştırarak borç oranlarını artırdığını göstermiştir.

Çalışma sonuçları gelişmekte olan ülkelere ait daha fazla veriyle analizin gerçekleştirilmesi ihtiyacını ortaya koymuştur. Farklı özelliklere sahip ülkelerin analize dâhil edilmesiyle teoriler arası uyuşmazlığın sebeplerinin daha açık ortaya konabileceği düşünülmektedir.