ÇANKAYA UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCE

MASTER OF BUSINESS ADMINISTRATION

MASTER THESIS

TESTING THE PECKING ORDER THEORY FOR TURKISH

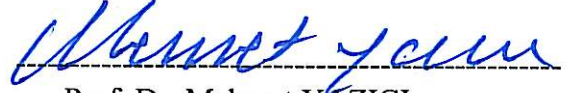**CORPORATIONS LISTED ON BARSEU ISTANBUL**

NAVID KHAZRAEI

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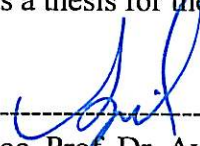
Corporations Listed On Barseu Istanbul

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ÖZET

BORSA İSTANBUL'A KOTE ŞİRKETLERDE FİNANSMAN HİYERARŞİSİ TEORİSİNİN TESTİ TESTING

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Yüksek Lisans Tezi

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Tez Yöneticisi: Prof. Dr. M. Mete DOĞANAY
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Bu tezin amacı, finansman hiyerarşisi teorisinin Borsa İstanbul'a kote anonim şirketlerde geçerli olup olmadığının incelenmesidir. Tezde Shyam-Sunder ve Myers tarafından önerilen metodoloji kullanılmıştır. İstatistiki analiz olarak dengelenmemiş panel regresyon yönteminin sabit etki modeli kullanılmıştır. Regresyon modeleinde borç seviyesindeki değişim bağımlı değişken, finansman açığı ise bağımsız değişken olarak alınmıştır. Finansman hiyerarşisi teorisine göre firmalar öncelikle iç fonlarını (dağıtılmamış kârlar) kullanırlar. Eğer iç fonlar yeterli olmazsa firmalar öncelikle borç alırlar, yeni hisse ihracına ise son çare olarak başvururlar. Eğer şirketler bu hiyerarşiyi takip ediyorlarsa, regresyon modelindeki kesişim katsayısı sıfıra eşit, regresyon katsayısı ise bire yakın olmalıdır. Modelde kullanılan değişkenlerle ilgili veriler halka açık anonim şirketlerin Kamuyu Aydınlatma Platformunun internet sitesinde yayımlanan nakit akım tablolarından derlenmiştir. Amprik sonuçlar Türkiye'de finansman hiyerarşisi teorisinin geçerliliğine yönelik zayıf kanıt ortaya koymaktadır. Bu durum halka açık anonim şirketlerin bazen yeni hisse ihracını borçlanmaya tercih ettiklerini göstermektedir.

Anahtar Kelimeler: Sermaye yapısı, Finansman açığı, Finansman hiyerarşisi teorisi, Borsa İstanbul

ABSTRACT

TESTING THE PECKING ORDER THEORY FOR TURKISH CORPORATIONS LISTED ON BARSEU ISTANBUL

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Master Thesis

Graduate School of Social Sciences
Master of Business Administration
Supervisor: Prof. Dr. M. Mete DOĞANAY
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The aim of this thesis is to empirically test whether the pecking order theory of capital structure is valid for Turkish corporations listed on Borsa Istanbul. The methodology proposed by Shyam-Sunder and Myers is utilized and unbalanced panel data regression analysis with fixed effect is performed. Change in borrowing is the dependent variable; financing deficit is independent variable in regression analysis. According to the pecking order theory firms first use internal funds (retained earnings) financing. If internal funds do not suffice firms first borrow then issue new stock as a last resort. If the corporations follow this hierarchy of financing the intercept term must be equal to zero and the regression coefficient must be close to one. Data for the variables are compiled from the cash flow statements of the publicly held corporations published in the web page of Public Disclosure Platform for the period of 2009-2014. Empirical results indicate weak support for pecking order theory in Turkey. This implies that publicly held corporations in Turkey sometimes prefer issuing new equity than borrowing.

Keywords: Capital structure, Financing deficit, Pecking order theory, Borsa Istanbul

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INTRODUCTION

Background

In these modern times, corporations are the critical part of financial activities and it's impossible to deny their role in economics. Financing has become the main concern of corporations. Development of corporations has led to increase in the production in all economies and supply of tax revenues for the governments at the same time has had a very positive impact on decreasing the poverty (Prasad et al., 2001).

One of the critical issues for a corporation is to design its capital structure, which can be defined as the mix of equity and interest bearing debt. Although it is critical for firms to have a proper balance in their capital structures, but there isn't any absolute path that can express the mindset of firms when they're selecting their own capital structure (Jen et al. 2003). Nevertheless, there exist many researches, which present many methods and patterns to explain how firms select their capital structures. Most of the empirical researches have indicated that pecking order theory provides more appropriate pattern to explain the capital structures of firms (Qinglan. 2013).

The majority of these researches are performed in developed countries with similar structures in their economics (Booth et al., 2001). But it is also necessary to consider that countries have different economic characteristics like interest rates, tax, bankruptcy, inflation and so on. Additionally, they have cultural and social differences. All of them influence the way firms are financed.

Turkey is one of the newly industrialized countries (NIC) in the world based on political scientists and economists. According to International Monetary Fund (IMF), economy of turkey is an emerging market economy, which means the country has some elements of a developed market, however she cannot satisfy all the requirements of a developed market. According to IMF, Turkey has a nominal GDP of 791 billion dollars. Inflation rate of the country is 6.57% in 2016. The main industries of Turkey are

tourism, textiles, food processing, mining, construction, electronics, lumber, petroleum, electronics, autos and paper.

Aim of the Study

The aim of this study is to test if the pecking order theory is valid for Turkish corporations listed on Borsa Istanbul during the period 2009-2014. In other words, the aim of this thesis is to investigate whether Turkish publicly held corporations follow the financing hierarchy proposed by the pecking order theory of capital structure.

Structure of the Thesis

Introduction section of this study introduces the background knowledge and aim of the study. First chapter provides the evolution of the capital structure theories and gives basic information related to these theories. Second chapter furnishes literature review in which previous studies are examined. In the third chapter methodology and data used in this study are explained, and the results of the empirical analysis are provided. Last chapter provides conclusion and also some recommendations for future work in this area.

CHAPTER 1

CAPITAL STRUCTURE THEORIES

1.1 Capital Structure and Its Importance for a Corporation

Capital structure theories were first introduced in the United States. Finance system in the United States is market based. In a market based finance system corporations acquire the necessary funds from the capital market by issuing securities. In fact, in the United States the purpose of establishing a business as a corporation is to get funds from the capital market.

Some researchers define capital structure as the mix of permanent capital. Permanent capital consists of long-term debt and equity. So, according to this view capital structure is the mix of long-term debt and equity. Capital in this context is used to indicate the money invested in the business. In this definition, short-term liabilities are excluded from the permanent capital and they are not considered in capital structure. Because short-term liabilities are due within a year and they are not the money committed to the business for a longer period. Permanent capital is the amount of money tied up in the business to generate revenue for more than a year. As it is said the purpose of the permanent capital is to acquire fixed assets to create operating capacity in order to generate revenue for a longer period of time. Permanent capital is also used to finance the permanent level of working capital, which can be defined as the minimum level of current assets for a business to continue its operations.

Some other researchers define capital structure as the mix of equity and interest bearing debt. According to their view some corporations may adopt aggressive financing policy and choose to finance a portion of fixed assets by short-term debt. In addition, short-term debt has also a cost and this cost should be included in the cost of capital. Also, short-term debt is also used to finance a portion of current assets. So, they claim debt short-term must be included in the capital structure. Baskin (1989) has the same

view and states that short-term debt must be included in the capital structure. Baskin regards debt as short-term and long-term borrowing. He states that what is important is not the maturity of debt but the amount of borrowing. He excludes trade credit from the amount of debt because he does not regard trade credit as a source of capital. He states that "suppliers provide credit as a convenient means of sale, not in order to seek a return".

In this thesis we accept the second view of capital structure. We define capital structure as "the mix of equity and interest bearing debt". As explained above capital is the money invested in the business. With this money both current assets and fixed assets can be financed. Corporations acquire this capital by incurring a cost. This cost may be a real cost such as interest, originating fee etc. as is the case in debt capital, or this cost may be an opportunity cost (foregone benefit not investing the money to another alternative instead of investing into the corporation) as is the case in equity capital. Spontaneous sources of financing such as trade payables, taxes and other duties payable, and advances from the customers are excluded from the capital structure because they are non-interest bearing liabilities.

Debt capital may be in the form of bank loans (short-term or long-term), financial leasing or in the form of issuing debt securities (bonds and bills). There are two main forms of equity capital, which are retained earnings and issuing new stock.

Modern finance theory states that the main purpose of a publicly held corporation is to maximize its value. In other words, maximize the market value of its stock. Maximizing the value also maximizes the wealth of the stockholders. Many scholars have tried to find an answer to the question "whether a corporation can maximize its value and minimize its cost of capital by changing its capital structure?" Value of a corporation is equal to the present value of its future free cash flows.

Free cash flow (FCF) = Operating income − tax on operating income + depreciation + other non-cash expenses (e.g.: bad debt expense) − additional net working capital − capital investment cash outflows. Value of a corporation can be expressed as follows:

$$Value = \frac{FCF_1}{(1+WACC)} + \frac{FCF_2}{(1+WACC)^2} + \frac{FCF_3}{(1+WACC)^3} + ... + \frac{FCF_n}{(1+WACC)^n}$$

Here, WACC is the discount factor. Smaller the discount factor higher the corporation's value. As it is said before there are two components of capital structure, which are debt and equity. Cost of debt is less than the cost of equity because lenders bear less risk compared to the stockholders. Lenders take precedence of the claim on assets. Since most of the risk born by the stockholders their required rate of return is higher. Required rate of return of the stockholders is the cost of equity. Scholars have investigated whether it is possible to reduce the cost of capital and increase the corporation's value by substituting debt for equity. The remainder of this chapter explores the capital structure theories.

1.2 Modigliani and Miller Theory (without taxes)

Seminal paper related to capital structure theory was published by Modigliani and Miller (1958). Modigliani and Miller states, under some unrealistic assumptions, that the capital structure is irrelevant for firm value. In other words, a firm cannot reduce its cost of capital and increase its value by changing its capital structure. This theory was considered by many people in the form of a suggestion in terms of a firm's debt-equity mix. Before Modigliani and Miller, there was not any universally approved theory of capital structure.

Lots of studies on capital structure in finance have examined Modigliani and Miller (1958)'s prominent feature implying situation to which capital structure can be unrelated to the value of firm.

As explained above, this theory states that the value of a firm is not related to the capital structure. No matter if a firm has lower debt or is very highly leveraged, it doesn't have any effect on its market value. Instead, its market value is directly related to the operating income of the firm.

Capital structure of a firm defines how assets of the firm are financed. Assets of a firm can be financed by either debt or equity or different mixture of them. A firm's capital structure may consist of mostly debt or mostly equity, merely one of the two elements as well as the same combination of both them. Debt financing and equity financing have their or advantages and disadvantages. Modigliani and Miller state that the amount of debt and equity in the capital structure has no effect on the firm value. Assumptions of the Modigliani and Miller capital structure theory are as follows:

a. Firms with the same degree of business risk form a homogeneous risk class.

b. Investors have homogeneous expectations about the expected firm's earnings and the riskiness of these earnings.

c. Stocks and bonds are traded in perfect capital markets. This means there are no transaction costs and no single investor can influence the prices.

d. Investors (individuals or institutions) can borrow at the same rate as corporations.

e. Investors and individuals can borrow at the risk-free rate as much as they want.

f. The firm distributes all income as dividend.

g. There are no taxes. Individuals and corporations do not pay any tax on their income.

h. Operating income and debt of the firms are perpetuities.

As explained before, they are very unrealistic assumptions. But Modigliani and Miller attempted to find an answer to capital structure theory under these assumptions. The propositions developed by Modigliani and Miller are presented below.

First Proposition: The earning power and riskiness of a firm's earnings primarily determine the value of the firm. The way that the firm finance its assets is not important. Two companies with different capital structures are considered and discussed by Modigliani and Miller. Capital structure of the first one includes debt, while capital structure of the other one does not include any debt. Assume that both companies are in the same risk class (the riskiness of their operating incomes are the same) and they have the same expected operating income. In their words $E(EBIT)$ and $\sigma EBIT$ are the same. Modigliani and Miller assert that their values cannot be different just because their capital structures are different. Their values must be the same because they are the same in every respect except the capital structure. They say that only factors that determine capital structure is the risk class of the firm and its expected operating income, which are $E(EBIT)$ and $\sigma EBIT$. According to Modigliani and Miller the value of a firm is expressed as follows:

$$V_L = V_U = EBIT / k_u$$

In this expression V_L is the value of a firm that has debt in its capital structure, V_U is the value of a firm that has no debt in its capital structure. In other words, V_U is all equity financed. k_u is the cost of equity of a firm that has no debt in its capital structure.

If $V_L > V_U$, this create an arbitrage opportunity and arbitrage continues until both firm's values are equal. The arbitrage proof developed by Modigliani and Miller is presented below.

By definition value of a firm is equal to the sum of the market value of its equity (market value of its stock) and debt. We can formulize this definition as follow:

$Vj = Sj + Dj$

Here Vj is the value of the jth firm, Sj is the market value of its equity, Dj is the value of its debt. EBIT is the operating income (earnings before interest and tax) of the same firm.

Suppose $V_L > V_U$ and an investor owns x % shares of L.

As the assumptions of the model say the firm distributes all of its income as dividend. So the share of income to this investor from L is as follows.

$I_L = x * (EBIT - k_d * D_L)$ where I_L is the share of income to the investor, k_d cost of debt (interest rate) and D_L is the amount of debt of the firm L. $k_d * D_L$ is the total amount

of interest paid to the lenders. After the interest is paid, EBIT $-$ $k_d * D_L$ is the remaining amount that can be paid out as dividend to the shareholders. X % of this income (denoted as I_L) belongs to the investor. So our investor earns I_L from his/her investment in the stock of L.

If $V_L > V_U$ our investor wants the take the advantage of the arbitrage opportunity. With this arbitrage opportunity, he/she gets a return with no additional risk and without spending any money out of his/her pocket. Our investor sells his/her shares in L. The money received from this sale is x * S_L where S_L is the total market value of L's stock. The investor takes out a loan equal to x * D_L where D_L is the total debt of L. Total amount of money received by the investor is:

x * S_L + x * D_L or x * (S_L + D_L)

The investor uses this money to buy U's stock. U is the firm that has no debt and U's EBIT is the same as that of L's. Investor's return from this investment is as follows:

$$I_U = \frac{x * (S_L + D_L)}{S_U} * EBIT - k_d * x * D_L$$

S_U is the total market value of U's stock. $\dfrac{x * (S_L + D_L)}{S_U}$ is the percentage of investment of our investor in the stock of U. This percentage times EBIT is the amount of income that comes from the earning of U. Interest paid on the loan ($k_d * x * D_L$) is subtracted from this amount to come up with the net income to the investor from this investment.

By definition S_L + D_L is equal to the value of L (V_L). Since U has no debt (D_U = 0) the value of U (V_U) is equal to S_U. So we can rewrite the expression above as follows.

$$I_U = x * \frac{V_L}{V_U} * EBIT - k_d * x * D_L$$

As it is shown above I_L = x * (EBIT $-$ k_d * D_L) or I_L = x * EBIT $-$ k_d * x * D_L

If $V_L > V_U$ then $I_U > I_L$. Then the investor gains a profit by selling his/her share in L, takes out a loan that is equal to x * D_L, and investing to total amount of the funds available to U's stock. As can be seen no extra money comes out of the investor's pocket.

Now let's examine risk of this transaction. Since L and U are in the same risk class there is no extra business risk. When the investor was the shareholder of L, x percentage of L's debt belonged to the investor. Now investor takes out a loan that is equal to his/her share of L' debt ($x * D_L$) by himself/herself. This is called home made leverage. So his/her financial risk is the same. We can say that there is no extra risk. So the investor gains a profit without bearing extra risk. That is why if $V_L > V_U$ investors sell L's stock and buy U's stock. This reduces the price of L's stock and increases the price of U's stock. This arbitrage operation continues until $V_L = V_U$. So Modigliani and Miller first proposition states that, under certain assumptions capital structure has no effect on firm's value. A firm cannot increase its value by just changing its capital structure.

Second Proposition: It is also impossible to reduce the cost of capital by changing the capital structure. As explained above debt is less costly. A firm cannot reduce its cost of capital by substituting less costly component (debt) for the costlier component (equity). More debt increases the financial risk of the firm that must be borne by the shareholders. So, shareholders demand more return to compensate higher risk. That situation increases the cost of equity so there is no change in the weighted average cost of capital.

1.3 Modigliani and Miller Theory (with taxes)

In a later article Modigliani and Miller (1963) relaxed no tax assumption. They say that they drop the assumption that corporations do not pay any tax on their income and accepted that corporations pay tax. This changes the all setting because interest is a tax-deductible expense. Corporations can deduct interest from their taxable incomes. So, interest has tax advantage for the corporations. Individuals cannot deduct interest from their taxable income. So borrowing of corporations is not the same as borrowing of the individuals because corporations have tax advantage whereas individuals do not have the same advantage.

According to Modigliani and Miller Theory with taxes value of a firm that has debt in its capital structure is as follows:

$V_L = V_U$ + Present value of tax advantage of debt.

$V_U = EBIT (1-T) / k_u$

Total return received by each investor group (shareholders and lenders) of a firm that has debt in its capital structure is presented below.

Total return received by the shareholders = $(EBIT - D_L * k_d) * (1-T)$

Here, from EBIT the return to the lenders, $D_L * k_d$ (amount of interest), is subtracted and result is multiplied by $(1-T)$ to reach after tax return to shareholders. T is the tax rate.

Return to the lenders is the amount of interest, which is $D_L * k_d$. So the total return received by the investors is:

$(EBIT - D_L * k_d) * (1-T) + D_L * k_d$

When the above expression is rearranged we obtain the following expression.

$EBIT (1-T) + D_L * k_d * T$

The expression presented above must be discounted to obtain the present value. There is EBIT on the left-hand side of the expression. EBIT is riskier so it must be discounted by k_u. There is interest ($D_L * k_d$) on the right-hand side of the expression. Interest is less risky so the discount rate must be different. Modigliani and Miller used k_d to discount the right hand-side of the expression. Following expression is obtained by discounting the above expression.

$V_L = [EBIT (1-T)]/k_u + [D_L * k_d * T)]/k_d$

$V_L = V_U + D_L * T$

Here, $D_L * T$ is the present value the tax advantage. So, Modigliani and Miller (1963) assert that a corporation can increase its value by using more debt in its capital structure.

Miller (1977) published another article related to capital structure theory. In this article he also took into consideration the personal income taxes. Corporations pay corporate income tax on their income. But individuals also pay personal income tax on their own income. Return to the investors, which are dividend and interest, must be included in the income tax base of the individuals. They are both taxable income. Miller says that personal income tax cancels out the tax advantage of interest. So, he asserts that the net effect of debt is zero and Modigliani and Miller model without taxes is valid.

Miller model, as Modigliani and Miller model without taxes, states that a corporation cannot increase its value by changing its capital structure.

1.4 Trade-Off Theory

Trade-offs tend to be fundamental to economics as well as to life. These are in the center of economics for the reason that society and decision makers may have conflicting objectives. Everyone considers the trade-offs that needs to be created the moment that the factors, which are utilized to control public decisions, are unable to all become completely satisfied.

Various authors utilize the concept of trade-off theory to explain a group of relevant theories. Throughout these theories, a decision maker managing a company appraises a variety of costs and benefits of different financing plans. Often it is supposed that an option is provided in order that marginal costs and marginal benefits are balanced.

An initial model of the trade-off theory developed from the discussion of the Modigliani-Miller theorem. When corporate income tax was combined with the initial irrelevance proposition this generated an advantage for debt because it presented a tax advantage. So a firm can increase its value by substituting debt for equity in its capital structure. More debt means more value for a firm. Logically, according to this assertion a firm maximizes its value when it is financed by 100 % debt.

Critics of this view say that more debt increases the risk of a firm. There are also debts related costs. They say that Modigliani and Miller model with taxes misses these points.

First of all, more debt increases the financial risk of a firm. More financial risk increases the probability of financial distress and bankruptcy. There are financial distress and bankruptcy costs. Direct costs of bankruptcy are the costs that must be incurred when the bankrupt occurs. Direct costs are legal and administrative costs related to bankruptcy procedures. Indirect costs of financial distress arise from the inefficient

decision of the managers when a business experience financial distress and actions of the employees, customers, and he suppliers. Managers may take actions to lower the costs in the short-term that may harm the long-term value. Employees may leave the business because they consider their job safety in danger. Suppliers and customers may hesitate to go into long-term relation with the firm. Suppliers also don't want to extent trade credit. All of them erode the long-term value of the business (Brigham and Gapenski, 1991). Trade off theory states the value of a firm that has debt in its capital structure as follows (Brealey and Myers, 1988):

$V_L = V_U + TD -$ Present value of financial distress costs $-$ Present value of agency costs

Debt has tax advantage as stated in Modigliani and Miller model with taxes. As explained before TD is the present value of tax advantage in the above expression. Tax advantage has a positive impact on the value. But there are also debt related costs such as financial distress and agency costs. Debt related costs have negative impact on value. Up to a certain debt level tax advantage of debt prevails. As the level of debt increases in the capital structure so do the debt related costs. At a certain point tax advantage of debt equates the amount of debt related costs. This level of debt is the optimal amount of debt and it is the optimal capital structure because firm value is maximized at that point (in other words at that level of debt). Beyond this level of debt, debt related costs prevail the tax advantage of debt and the value of the firm decreases. So, firms can maintain an optimal capital structure by balancing the costs and benefits of debt.

Researchers such as Robichek and Myers (1966), Baxter (1967), Kraus and Litzenberger (1973), Kim (1978), and DeAngelo and Masulis (1980) pointed out the debt related costs and stated that firms tried to balance the costs and advantages of debt when they made decisions related to capital structure.

Besides presenting an optimal capital structure, trade off theory has some other implications. These implications are mentioned below: (Brigham and Gapenski, 1991).

- Level of debt is related to the business risk, which can be defined as the variability of operating income. High business risk increases the probability of financial distress and in turn the cost of financial distress. That is why firms with high business risk should refrain from borrowing. High level of debt negatively affects the value of the firms that have high business risk.

- Firms that have more tangible assets in their asset structure may borrow more because when bankruptcy actually occurs tangible assets can be converted into cash to settle the debt.

- Profitable firms may borrow more. Profitable firms have more taxable income and they may make use of tax advantage of interest.

Trade off theory of capital structure is not criticism free. Warner (1977) states that direct costs of bankruptcy are too small to affect the value of a firm, and also states that it is too hard to quantify the indirect costs of bankruptcy. Myers (1989) states that there is an inverse correlation between profitability and debt. He says that most profitable firms use less debt.

1.5 Pecking Order Theory

The pecking order theory was first introduced by Myers (1984). Previous literature and especially the book authored by Donaldson (1961) inspired Myers. Pecking order theory of capital budgeting is based on adverse selection and asymmetric information. Myers asserts that because of adverse selection retained earnings are superior to debt and debt is superior to equity. This rating was encouraged with regards to the Myers and Majluf's (1984) adverse selection model.

The pecking order theory is one of the important theories of corporate finance. Based on Myers (1984), because of adverse selection, preferable choice for the firm is internal finance, not external. Whenever the firm needs external funds, it chooses first debt instead of equity issue due to debt issues send less adverse signals to the investor. Firms should issue debt as a last resort.

Asymmetric information implies that managers have better information than the investors about the prospects of the firm and as a result they have much better idea about the true value of its stock. According to asymmetric information theory managers issue stock whenever they believe that their firms' stock is overvalued. In other words, they issue stock whenever the market value of their firms' stock is more than the true (intrinsic) value. Managers are eager to take the advantage of this situation. Managers are in the position to evaluate the true value of their firms' stock because they possess all the information related to the value of the stocks. Myers, and Myers and Majluf also state that managers decide to issue new shares when they are pessimistic about the future of the firm. They are pessimistic because the value of their firms' stock is overpriced. The value of he stock will drop to its true value when the information asymmetry disappears.

On the other hand, investors are aware of this fact. Whenever a firm announces new stock issue investors believe that the stock is overpriced and the managers of the firm want to issue new stock in order to take the advantage of this situation. As explained above investors believe that managers are pessimistic about the future prospects of the firm. So they accept to buy the stock at a discount. In other words, they consent to buy the stock from the new issue at a lower price. For this reason, announcement of a seasoned (secondary) equity offering causes a sharp decline in the price of the stock. Since a new stock issue sends bad signals to the investors and causes a decline in the price of the stock managers are reluctant to issue new shares and they issue new shares only as a last resort.

Pecking order theory splits equity into two components one of which is the retained earnings (internally generated funds or internal equity) another one is the newly issued shares (external equity). Trade off theory doesn't make this distinction between internal and external equity. Pecking other theory also states that firms should keep financial slack. Financial slack is valuable. This implication of the theory is related to internal capital. The firm may have retained earnings on its balance sheet. But that does not

mean the firm keeps these earnings as cash. Retained earnings is just an accounting (accrued) item. Financial slack is readily available funds in the form of cash and marketable securities. The firm uses these funds to finance its assets and operations. According to pecking order theory the firm should first use internal equity. If the internal funds are not sufficient and external financing is required, the firm should borrow (debt financing) first because debt financing (issuing debt instruments or taking out a bank loan) does not send bad signals to the investors about the future prospects of the firm. As explained above the firm should new shares only as a last resort because of its adverse signal.

CHAPTER 2

LITERATURE REVIEW

Modigliani and Miller models are theoretical in nature and they present no opportunity of empirical studies. That is why there is no empirical study related to Modigliani and Miller models in the literature. On the other hand, trade-off theory is suitable for empirical study and there is a vast literature related to the empirical work of trade-off theory in the literature.

Pioneering study on this topic was conducted by Titman and Wessels (1988). They examined the effect of several attributes on the capital structure of the businesses. These attributes are: asset structure, non-debt tax shields, growth, uniqueness, industry, size, earnings volatility, and profitability. As indicated in the previous chapter when the implications of trade off theory are discussed, when bankruptcy actually occurs tangible assets can be converted into cash to settle the debt. That is why firms that have more tangible assets in their asset structure are expected to borrow more. Main advantage of debt is the tax advantage of interest. If a firm has other tax shields such as depreciation, amortization, and loss carry forwards interest tax shield diminishes in importance. So, firms that have other tax shields are expected to use less debt. Growth opportunities are intangible and cannot be collateralized. That is why firms whose values are derived mainly from growth opportunities are expected to use less debt. Uniqueness is related to producing unique products or providing unique services. In this type of firms if bankruptcy occurs customers, suppliers, and employees suffer higher costs. The reason is that customers may not find these specialized products or services, suppliers may not find customers, and because of their specialized skills employees may not find a comparable job. That is why the present value of financial distress costs is higher for the firms that produce unique products or provide unique services. This type of businesses is expected to use less debt. Bankruptcy costs are higher in certain industries because of their characteristics. That is why firms operating in those industries are expected to use less debt. The probability of bankruptcy for large firms is lower compared to the smaller

sized firms. For this reason, present value of financial distress costs is less in large firms and they are expected to use more debt. Earnings volatility is the main indicator of business risk. In the previous chapter business risk is defined as the variability of the operating income. Firms with high business risk are expected to use less debt. As indicated in the previous chapter profitable firms have more taxable income and they may make use of tax advantage of interest. So profitable firms are expected to use more debt. Authors used measurable proxies for the attributes and developed an empirical model to test which attributes affect the capital structure of the firms. Following this paper other researchers have investigated the validity of trade off theory by using the similar attributes.

One of the early empirical studies conducted to test the pecking order theory was performed by Baskin (1989). He basically uses similar attributes used by Titman and Wessels. Dependent variable in the regression analysis was debt ratio. Independent variables were proxies for profitability, growth, size, uniqueness, industry, and past dividends. In this study his aim was to find evidence in support of the pecking order theory as opposed to the trade-off theory. He found strong evidence in favor of the pecking order theory.

Another study that tested the pecking order theory against the trade-off theory was conducted by Shyam-Sunder and Myers (1999). They also performed regression analysis but used different dependent and independent variables. They defined independent variable as the financing deficit, DEF. DEF is defined as follows:

$DEF_t = DIV_t + X_t + \Delta W_t + R_t - C_t$

where,

DEF_t is the financial deficit for a specific firm in time t,

DIV_t is the dividend payments in time t,

X_t is the capital expenditures in time t,

ΔW_t change in working capital in time t,

R_t is current portion of long-term debt at start of the period,

C_t is operating cash flows, after interest and taxes, in time t.

The regression model of Shyam-Sunder and Myers is as follows:

$$\Delta D_{it} = a + b_{PO} DEF_{it} + e_{it}$$

where,

ΔDit is the net borrowing (funds borrowed – funds repaid) in time t for firm i,

DEFit is the financing deficit in time t for firm i.

Shyam-Sunder and Myers states that a must be equal to zero and bpo must be equal to one if the firms follow the pecking order. Shyam-Sunder and Myers found strong evidence for the support of pecking order theory in their research.

Another pioneering study related to the test of pecking order theory was performed by Frank and Goyal (2003). They basically used the same approach adopted by Shyam-Sunder and Myers. Frank and Goyal defined the financing deficit as follows:

DEFt = DIVt + It + ΔWt - Ct

They defined It as the net investment in year t. It = capital expenditures + increase in investment + acquisitions + other use of funds – sale of plant, property and equipment – sale of investment. As can be seen from the above expression the current portion of long-term debt is not included in the financing deficit. Change in current debt is included in ΔWt. But Frank and Goyal also estimated the Shyam-Sunder and Myers' equation and empirically confirmed that short-term portion of long-term debt is not part of financing deficit. They found that large firms follow the pecking order.

After these two pioneering papers other paper have also been published related to the test of the pecking order theory sme of which mentioned below.

De Jong, Verbeek and Verwijmeren (2011) expanded Shyam-Sunder and Myers (1999) model by separating the impacts of large deficits, normal deficits and financing surplus. By utilizing broad cross-section of publicly traded firms from the time period 1971 to 2005, they discovered that the predicted coefficient of pecking order theory is lowest for large deficit, higher when firms have normal deficit and highest for firms have surplus. Two empirical puzzles were clear up by these conclusions. The first puzzle was that although small firms have the highest potential for asymmetric information, but

their behavior is not based on the pecking order theory. The second one was the explanatory power of pecking order theory has been lost over time. They solved these puzzles by demonstrating that the frequency of large deficit is greater in smaller firms and growing over time.

Shakil Khan and Adom (2015) made use of cross section of 12,244 publicly traded corporations in the U.S. from 1999 to 2009 in order to evaluate the pecking order hypothesis. They found weak proof by using the methodology of Frank and Goyal (2003) to support this hypothesis. Although it is suggested by pecking order theory that firms should use all capacity of debt issuance before issuing equity and they use equity as a final option, they observed that the relationship between financing deficit and net equity is superior than financing deficit and net debt issue.

Hsu, Chiang and Liao (2013) tried to find out how well the pecking order theory explains the financing behavior of the US firms. Firms were classified as multinational firms and domestic firms because there are several different characteristics between multinational firms and domestic firms. As a result, they observed that financing behavior of multinational firms are represented better by pecking order theory than domestic firms. A concave relationship between financing deficit and net debt issue for both types of firms is illustrated by the result from the curvilinear regression models, which shows that the deficit of the firms is financed firstly by issuing debt and if firms reach their debt capacity, they will start to issue equity.

Jibran, Wajid, Waheed and Muhammad (2012) tested the pecking order theory for Pakistani firms listed on Karachi Stock Exchange. It's sustained by pecking order theory that in its strong form of the theory firms never issue equity, whereas it accepts small amount of equity issuing in its weak form. They consider a sample of capital structure of non-financial firms covering a period of 8 years from 2001-2008. Data of different firms is tested by panel data regression analysis. The results showed that the weak form of pecking order theory was supported by firms in Karachi Stock Exchange. It's more preferred to use internal equity and debt, whereas using external equity is limited.

Pardesi (2012) examined the pecking order theory of textile firms listed on Karachi Stock Exchange from the time period 2004 to 2009. He discovered that internal financing was more preferable than external financing for these firms. Nevertheless, it's not clear that firms prefer debt issuing to equity issuing and more research on both empirical and theoretical front is required. However, he stated that financing behavior of firms was more interpretable by the pecking order theory than the conventional leverage factor.

Chirinko and Singha (2000) showed that even if the financial behavior of firms was according to the pecking order hierarchy, it was possible that the value of the coefficient in Shyam-Sunder and Myers regression model was considerably less than one due to the amount of deficit. In case the deficit tends to be considerably large, there would be a restriction for he firms to issue debt and makes them to issue equity instead. Lemmon and Zender (2010) examined this specification empirically and discovered that the pecking order theory didn't work properly with firms having restriction in issuing debt.

Vidal and Ugedo (2005) tested the pecking order theory in the Spanish market. They analysed 1,566 firms from 1994 to 2000. Sample according to number of employees, sales and total assets was divided to 3 sub-samples: small, medium and large. By using panel data regression analysis, they showed that the firms, especially the small and medium sized ones, followed the pecking order theory. At last, they discovered that funds flow deficits of the firms were financed mainly with long term debt.

Choudry and Sundaram (2013) tested the pecking order theory on Indian firms over the period of 1991 to 2009. They focused on high growth Indian firms. Data collected from Center for Monitoring Indian Economy for nine sectors, which had high growth rates. They correlated the data associated to assets, debt and reserves. They observed that Indian firms did not follow the pecking order theory. Previous researches on Indian firms have reached the same conclusions. Reddy and Babu (2008) illustrated that while Indian pharmaceutical firms prefer retained earnings for financing, but issuing equity is more preferable than issuing debt. It was also shown by Aggarwal et al. (2009) that Indian top managers were conservative and preferred equity issue to debt issue.

Ni and Yu (2008) attempted to ascertain if the pecking order theory was followed by the Chinese firms. They utilized the cross-section sample of 442 firms listed on the Shanghai Stock Exchange in 2004 and found that there was not any evidence that pecking order theory was followed by these firms. Additional sub-sample analyses showed that small and medium sized firms didn't follow pecking order theory whereas big firms did. They concluded that main reasons of this result were imperfection of Chinese capital market and also economic laws which made issuing equity more desirable in China.

Maimako and Moses (2011) tested Nigerian economic sphere in order to evaluate whether they followed the pecking order theory. Ratios and the Pearson's Contingency Coefficient and Correlation of Attribute along with the standard Regression model were used to analyze the 20 most capitalized firms listed on the Nigerian Stock Exchange over the period of 2005 to 2008. The results showed that financial behavior of sample firms was considered from internal pool and equity, which indicated that capital structures of Nigerian firms were not according to the pecking order theory.

Medeiros and Daher (2005) examined whether the pecking order theory could explain empirically the capital structure of Brazilian firms. They collected the data of 132 non-financial firms listed in Brazilian stock exchange in 2001. They excluded financial institution due to their different accounting processes. Cross-section linear regression by OLS were used for the empirical tests of the pecking order theory in both strong and weak form. It's shown that capital structures of Brazilian firms support the weak form of the pecking order theory, which stated that limited amount of equity issue are acceptable.

Validity of the capital structure theories have also been tested in Turkey using the data of the corporations whose stocks are listed in Borsa İstanbul (formerly Istanbul Stock Exchange). One of the pioneering study that used Turkish data was performed by Durukan (1997). She used several leveraged ratios as dependent variable. Independent

variables were similar to the variables chosen by Titman and Wessels (1988) and other researchers who followed their methodology. She chose size, risk (variability of operating income), profitability, non-debt tax shields, growth, and tax rate (tax bracket) as the attributes that had an impact on capital structure. They used proxies as independent variables representing these attributes. Analyses showed that profitability and non-debt tax shields are the most important factors that affected the capital structure.

Acaravcı and Doğukanlı (2004) performed a similar study. They grouped independent variables that are expected to have an impact on the capital structure as firm specific factors, financial markets specific factors, and macroeconomic factors. They chose variables representing the related factors from each group. Analyses showed that growth of assets, maturity of the banking sector, inflation, corporate tax rate, are positively affected leverage whereas profitability negatively affected the leverage.

Çağlayan (2006) also performed a similar study. She used proxies for size, profitability, growth, and tangibility of the assets factors. She performed quantile regression analysis. She chose this method because it handled the extreme values better. She stated that analyses found enough evidence in favor of pecking order theory of capital structure.

Okuyan and Taşçı (2010) examined the validity of trade off and pecking order theories of capital structure in the largest 1000 manufacturing corporations in Turkey. They used proxies representing the factors of size, profitability, level of its exports, structure of the owners (percentage of private owners and foreign owners), and value added created. The purpose of the authors is twofold. One of the purposes is to examine the factors affecting the capital structure of the firms. Another factor is to test which theory (trade off or pecking order) better explains the capital structure of the firms. Authors state that trade off theory expects the smaller businesses to borrow less because the probability of financial distress is higher for smaller businesses. On the other hand pecking order theory expects that larger businesses borrow less because larger business have more internal funds compared to smaller businesses. Authors also state that trade

off theory expects profitable businesses borrow heavily because they want to take the advantage of interest tax shield. On the other hand, pecking order theory expects that profitable businesses borrow less because they have more internal funds to use. They also found strong evidence in support of the pecking order theory.

Yakar (2011) prepared a master's thesis n capital structure theories and the validity of these theories for the firms listed in Borsa İstanbul. He also used leveraged ratios as the dependent variables in the models he constructed. Independent variables were also proxies for the factors of asset structure, profitability, size, risk (variability of the operating income), tax burden, non-debt tax shields, borrowing cost, growth, and liquidity. Analyses showed evidence supporting the pecking order theory of capital structure.

Akman (2012) prepared a doctorate dissertation on this subject and basically used the same variables.

As can be seen from the literature review all of the papers, thesis, and dissertations in Turkey related to capital structure theories followed Titman and Wessels' methodology. We cannot find any research work that followed Shyam-Sunder and Myers' methodology as much as we have found. That motivated us to follow Shyam-Sunder and Myers' methodology to test the pecking order theory of capital structure for the firms listed in Borsa Istanbul.

CHAPTER 3

ANALYSIS

3.1 Problem definition

Main purpose of this thesis is to examine whether the publicly held corporations in Turkey follow the pecking order theory of capital structure.

As stated in the previous chapter, all of the papers, theses, and dissertations in Turkey investigating the validity of the pecking order theory of capital structure have employed Titman and Wessels' methodology. In this thesis a different methodology is employed to investigate the validity of the pecking order theory. This thesis employs the Shyam-Sunder and Myers' methodology. We believe that Titman and Wessels' methodology is more appropriate to test the validity of the trade off theory of capital structure. We find it more appropriate to use Shyam-Sunder and Myers' methodology to test the validity of the pecking order theory. Most of the research papers outside Turkey examining the validity of the pecking order theory have employed Shyam-Sunder and Myers' methodology. For this reason, in this thesis the validity of the pecking order theory in publicly held corporations operating in Turkey is investigated by using Shyam-Sunder and Myers' methodology.

Most of the relevant studies has been dedicated on developed markets. However, some of them have done on emerging markets. Pardesi (2012) is one of the most notables. Nevertheless, the perfect environments are provided by the emerging market to examine the pecking order theory, which shows that more studies are needed to be performed in these markets.

3.2 Limitations of the Study

This thesis investigates the validity of the pecking order theory for the publicly held corporations. In other words, corporations whose stocks are offered to public and traded in Borsa Istanbul are included in this study. This also the case in nearly all of the studies related to this topic that have been performed Turkey and outside Turkey. Of course privately held corporations may also follow pecking order to finance their activities. But these corporations are excluded in this study because their financial statements are not made public and it is very hard to obtain their financial statements for the purpose of compiling data.

The data start from 2009. The reason for this is that the current web page of the Public Disclosure Platform publishes the financial statements of the publicly held corporations beginning from 2009. We believe that 2009-2014 period (six years) is an appropriate time frame for our study because it contains both recession and growth cycles.

3.3   Methodology and Result

3.3.1   Model Specification

In this study Shyam-Sunder and Myers' specification is used, which is is presented below:

$$\Delta D_{it} = a + b_{PO} DEF_{it} + e_{it}$$

The terms used in this study for above specification is slightly different from those of used in Shyam-Sunder and Myers' and Frank and Goyal's studies. The terms used in this study is explained below:

ΔD_{it} is the net borrowing in time t for firm i. ΔD_{it} is calculated as follows:

ΔD_{it} = cash inflows from the bank loans taken out (both long-term and short-term) - cash outflows for the repayment of the bank loans (both long-term and short-term) + cash inflows from bonds issued – cash outflows for the repayment of the outstanding bonds – cash outflows related to financial lease payments

As can be seen from the above expression debt financing includes four components, which are short-term bank loans, long-term bank loans, bonds issued, and financial leasing. Financial leasing does not generate any cash inflows. On the other hand periodic lease payments create cash outflows.

DEF_{it} is the financing deficit in time t for firm i. DEF_{it} is calculated as follows:

$$DEF_t = C_t + I_t - DIV_t + INTR_t - INTP_t$$

Where

C_t is the cash flows from operations in a given year. It also includes change in net working capital (ΔW_t). Net working capital excludes short-term bank loans, short-term portion of long-term debt, and short-term financial lease liabilities. Since they are interest bearing debt they are part of the capital structure and included in ΔD_t as explained above. Tax payments are included in C_t. Whole of or a portion of interest paid and interest received are sometimes included in C_t.

I_t is cash flows from investments in a given year. I_t includes capital expenditures, increase in other investments, sale of plant, property and equipment, sale of other investments, and dividends received. Whole of or a portion of interest paid and interest received are sometimes included in I_t.

C_t and I_t may be positive or negative. If C_t is positive, in a given year cash inflows from operations exceed cash outflows from operations. If C_t is negative, in a given year cash outflows from operations exceed cash inflows from operations. If I_t is positive, in a given year cash inflows from investments exceed cash outflows from investments. If I_t is negative, in a given year cash outflows from investments exceed cash inflows from investment.

DIV_t is the dividends paid in a given year. Payment of dividends requires cash outflows. That is why DIV_t is always negative.

$INTR_t$ is the interest received in a given year. $INTR_t$ is the amount of interest that is not included in C_t and I_t. Since interest received generates cash inflows $INTR_t$ is always positive.

$INTP_t$ is the interest paid in a given year. $INTP_t$ is the amount of interest that is not included in C_t and I_t. Since interest paid causes cash outflows $INTP_t$ is always negative.

If there is a financing deficit, in other words if DEF_t is negative, this means that internal funds were not sufficient in a given year. According to pecking order theory of capital structure this shortfall must first be made up by debt. That is why we expect the coefficient (b_{PO}) to be equal to one or almost one.

3.3.2 Data

Data were collected from the cash flow statements of the publicly held corporations published in the web page of the Public Disclosure Platform.

Financial service companies such as banks, factoring companies, insurance companies, and holding companies are excluded because their cash flow statements are prepared in a different way. Service, manufacturing, and merchandising companies are included in the data.

Values of the whole variables mentioned above were compiled from the cash flow statements of the corporations. Data period covers 2009-2014.

3.3.3 Statistical Model and Result

The descriptive statistics are presented in the following table:

	C_t	I_t	DIV_t	DEF_t	ΔD_t
Min	-254,145,534	-2,716,012,000	0	-14,569	-2,082,777,000
Max	4,436,041,000	543,417,000	-2,492,420,000	-2,264,143.000	2,411,159,000
Mean	178,619,546	-110,781,926	-57,764,852	-1,271,248	20,791,748
Median	19,773,785	-10,110,195	-1,295,585	-2,121,626	222,875
Std. Dev	531,718,236	330,069,330	232,859,704	270,157,609	283,797,606

As mentioned above, the regression model is,

$$\Delta D_{it} = a + b_{PO} DEF_{it} + e_{it}$$

As can be seen from double subscript (it) the model is panel data regression model. The data is the combination of cross section data and time series data. Cross

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sectional units are corporations denoted by the subscript (i). Values of the variables (ΔD_{it} and DEF_{it}) are collected for the same cross sectional unit over time. DEF_{it} denotes the financing deficit of corporation (i) in year (t). Likewise, ΔD_{it} is the net borrowing of corporation (i) in year (t). The panel data is unbalanced because there are different number of time series observations for each cross sectional unit (for each corporation). The reason for this situation is that each corporation has financing deficit in different number of years. For example, one corporation has financing deficit in four years whereas another corporation has financing deficit in only one year.

Fixed effect model is used to estimate the regression model. Fixed effect model takes into account that capital structure policies of the corporations may be different from each other. The model also assumes that the capital structure policy of each corporation stays constant over time. In other words, capital structure policy of each corporation does not change in each year and the same policy is implemented every year throughout the time frame covered by the data.

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
a	1.122e+07	6.10066e+06	1.8392	0.0671
b_{PO}	−0.545767	0.119605	−4.5631	<0.0001

When we examine the coefficients we see that the null hypothesis a = 0 cannot be rejected at 0.05 significance level. So we should accept that a = 0 and this is consistent with the expectation that if pecking order theory is valid the intercept must equal to zero. The other coefficient (b_{PO}) is −0.546 and highly significant. If the pecking order theory is strictly followed by the corporation b_{PO} must be equal to one. In our case b_{PO} is slightly over 0.5. This result shows that in Turkey there in not strong support for the validity of the pecking order theory of capital structure. Turkish corporations whose shares are traded in Borsa Istanbul do not strictly follow the pecking order theory. On the other hand, since b_{PO} is higher than 0.5 we can say that there is weak support for the pecking order theory.

Robust test for differing group intercepts was also performed. Test results are presented below:

Robust test for differing group intercepts -

Null hypothesis: The groups have a common intercept

 Test statistic: Welch $F(96, 78.7) = 2.94494$

with p-value $= P(F(96, 78.7) > 2.94494) = 7.64914e\text{-}007$

Test results show that the groups (corporations) have a common intercept is rejected. This means that corporations have different capital structure policies.

CHAPTER 4

CONCLUSION

This study is aimed to empirically examine whether the pecking order theory of capital structure is valid for the Turkish corporations listed on Borsa Istanbul. Concerning the many theories proposed during the last decades, Myers (1984) is the first scholar who proposed pecking order theory, which states that when firms have a financing deficit (in other words when they need funds) internal funds are more preferable than external funds to make up this deficit. In case of external funds, borrowing (debt financing) is the first option and issuing stock is the final option. Accordingly, Myers asserts that corporations follow a hierarchy when they need funds. The main reason of this pecking order is primarily related to the adverse selection because issuing new stock sends negative signal to the investors. The reason for the negative signal lies in the fact that investors believe the managers issue share when the share is overvalued. Overvalued means the market price of the shares are above their true values and eventually the price of the shares will decline to their true value.

As mentioned above, the purpose of this study is to investigate whether the managers of the publicly held corporations in Turkey follow the financing hierarchy proposed by the pecking order theory. Shyam-Sunder and Myers' methodology is used to test the validity of the pecking order theory. Necessary data are collected from the cash flow statements of the publicly held corporations published in the web page of Public Disclosure Platform. Unbalanced panel data regression and fixed effect model are used in the statistical analysis.

Based on the statistical results we have concluded that the weak form of the pecking order theory is followed by the Turkish firms, which indicates that the Turkish firms do not strictly follow financing hierarchy. When there is a financing deficit Turkish firms sometimes prefer issuing stock than borrowing.

The main reason for this result may be due to the fact that corporations consider issuing stock as a less expensive way of financing because a seasoned offering does not require a lot of paper work and the corporations are not obliged to pay dividend. Secondly, corporations may want to time the market by issuing shares. But we obtained a weak support on behalf of the pecking order theory. This finding shows that, still Turkish corporations prefer first borrowing. We have to point out that Turkish firm take out a bank loan as opposed to issuing debt securities when they decide to borrow. In Turkey there is not an advanced corporate debt securities market. On the other hand, a seasoned equity offering is not considered very bad for the Turkish publicly held corporations.

It is strongly recommended that additional studies with greater data set must be performed on the subject. It is also very advisable for the further studies to take into consideration the market timing because decision for a seasoned equity offering is highly affected by the market conditions.

Preparing the managerial surveys is also advised by asking them regarding their preference for a specific option of financing. This would be helpful to comprehend whether the pecking order is followed by firms or not.

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