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**SENTIMENT AS A DETERMINANT OF CAPITAL
STRUCTURE: EVIDENCE FROM BORSA ISTANBUL**

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ABSTRACT

Master's Thesis

Sentiment as a Determinant of Capital Structure: Evidence from Borsa İstanbul

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One of the main aims of the firms is to maximize shareholders' wealth. In this regard capital structure decisions of firms play an important role. On the context of finance literature, firm-specific factors affecting capital structure decisions are stated as firm size, profitability, tangibility of firm assets, liquidity, growth opportunities, tax shield and non-debt tax shield; while macroeconomic factors are stated as inflation, gross domestic product and financial market development level.

Behavioral Finance argues that biases influence individuals in their decisions. Managers as individuals are also influenced by biases while they are making decisions about their firms. In line with this argument, the capital structure decisions are expected to be influenced by managerial sentiment as well as investor sentiment, which represent expectations and perceptions of investors and managers about the general economic situation.

This study aims to test whether investor and managerial sentiment affect capital structure decisions of firms listed on Borsa Istanbul for the period 2010 to 2017. In this respect, data on 169 firms traded on Borsa Istanbul have been collected to analyze whether the investor and managerial sentiment affect firms' indebtedness levels by using Generalized Least Squares Method.

The empirical findings exhibit a statistically significant negative relationship between both investor and managerial sentiment and capital structure. This implies that as managers and investors become more optimistic, the leverage levels fall. That is managers prefer raising capital through equity financing.

Keywords: Capital Structure, Investor Sentiment, Managerial Sentiment



ÖZET
Yüksek Lisans Tezi
Sermaye Yapısı Belirleyicisi Olarak Duyarlılık: Borsa İstanbul Örneği
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Firmaların temel amaçlarından biri hissedarlarının refahını maksimum kılmaktır. Bu amaca ulaşmakta firmaların sermaye yapısı kararları önemli rol oynamaktadır. Finans literatüründe sermaye yapısını etkileyen firmaya özgü faktörler firma büyüklüğü, karlılık, firma aktiflerinin yapısı, likidite, firmanın büyüme fırsatları, vergi kalkanı ve borç dışı vergi kalkanı; makroekonomik faktörler ise enflasyon, gayrisafi yurt içi hasıla ve finansal piyasaların gelişmişlik düzeyi olarak yer almaktadır.

Davranışsal Finans bireylerin karar verme süreçlerinde önyargılardan etkilendiğini öne sürmektedir. Yöneticiler de birer birey olarak firmalar hakkında karar alırken önyargılardan etkilenirler. Bu sava paralel olarak, sermaye yapısı kararlarının, yatırımcı ve yöneticilerin genel ekonomik durum hakkında beklentileri ve algılarını temsil eden yatırımcı ve yönetici duyarlılığından da etkilenmesi beklenmektedir.

Bu çalışma, 2010-2017 yılları arasında Borsa İstanbul'da işlem gören firmaların sermaye yapısı kararlarının yatırımcı ve yönetici duyarlılığından etkilenip etkilemediğini test etmeyi amaçlamaktadır. Bu bağlamda, Borsa İstanbul'da işlem gören 169 şirkete ait veriler yatırımcı ve yönetici duyarlılığının firmaların borçluluk seviyelerini etkileyip etkilemediğini ölçmek için Genelleştirilmiş En Küçük Kareler Yöntemi ile analiz edilmiştir.

Ampirik bulgular, hem yatırımcı hem de yönetici duyarlılığı ve sermaye yapısı arasında istatistiksel olarak anlamlı negatif ilişki olduğunu ortaya koymuştur. Bu, yöneticiler ve yatırımcılar daha iyimser hale geldikçe,

firmaların borç seviyelerinin düřtüęü anlamına gelir. Bu, yöneticilerin öz sermaye finansmanı yoluyla sermaye artırmayı tercih ettięinin bir göstergesidir.

Anahtar Kelimeler: Sermaye Yapısı, Yatırımcı Duyarlılıęı, Yönetici Duyarlılıęı



**SENTIMENT AS A DETERMINANT OF CAPITAL STRUCTURE:
EVIDENCE FROM BORSA ISTANBUL**

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ABBREVIATIONS

BTS	Business Tendency Survey
CCI	Consumer Confidence Index
CFO	Chief Financial Officer
CPI	Consumer Price Index
CTS	Consumer Tendency Survey
EBIT	Earnings Before Interest and Taxes
EMH	Efficient Market Hypothesis
EMH	Efficient Market Hypothesis
EUT	Expected Utility Theory
G7	Group of Seven
GDP	Gross Domestic Product
GLS	Generalized Least Squares
IPO	Initial Public Offering
NPV	Net Present Value
NPV	Net Present Value
PCA	Principal Component Analysis
RSCI	Real Sector Confidence Index
UK	United Kingdom
US	United States of America
WACC	Weighted Average Cost of Capital

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INTRODUCTION

Every firm needs funds to start and continue operating. Firms can get the required funds through debt or equity financing. Capital Structure can be described as the portion of debt and equity financing in the total capital. Keeping capital costs at the minimum level is vital for every firm in accordance with the aim of maximizing the firm value and shareholders' wealth. Both debt and equity financing have some advantages and disadvantages. Accordingly, owners or managers of the firms who make decisions about the capital structure have to take these advantages and disadvantages into consideration to balance the effects. In this regard many theories such as the Irrelevance Theory, Tradeoff Theory, Pecking Order Theory, Market Timing Theory and Signaling Theory about capital structure have been put forward. However, the issue of optimal capital structure still remains a puzzle and is one of the main focuses of finance researchers.

Determinants of capital structure are classified under two subcategories as firm specific factors and macroeconomic factors. Firms have their own characteristics which affect their capital structure decisions. These firm specific factors can be listed as firm size, tangibility of the firm's assets, profitability, growth opportunities, tax shield and non-debt tax shield. Capital structure theories put forth various expectations regarding the effects of firm specific factors on capital structure. Furthermore, studies which investigate the relationship between firm specific factors and capital structure empirically have found different results. In this sense, it can be stated that there is no definite conclusion about the relationship between the firm-specific factors and capital structure. Macroeconomic factors that are investigated in the literature can be listed as inflation, gross domestic product and financial market development.. Similar to firm specific factors, the empirical findings of the research on the relationship between the macroeconomic factors and capital structure yield inconclusive results.

Traditional Finance Theories assume that people behave rationally during the decision making process and disregard the effect of psychological factors. Contrary to the rationality assumption of the traditional finance theories, Behavioral Finance assumes that people do not act rationally when making decisions. Hence they are

affected from heuristics and biases while forming their expectations throughout the decision making processes. Sentiment is defined as the perceptions of investors regarding the financial markets. Capital structure decisions are also influenced by the decision makers' psychological conditions and biases as well as by the investor sentiment and managerial sentiment.

Within this context, in addition to the firm specific and macroeconomic factors researched in the capital structure literature, this thesis argues that sentiment should also be investigated as a capital structure determinant. Sentiment is examined under two categories as investor sentiment and managerial sentiment in the empirical analysis. While investor sentiment represents the expectations and perceptions of investors about the general economic situation, managerial sentiment implies managers' expectations and perception.

The aim of this study is to evaluate the effects of both managerial and investor sentiment on capital structure decisions (leverage) of the firms listed on Borsa Istanbul for the period 2010 to 2017 using quarterly data. This thesis contributes to the capital structure literature both nationally and internationally due to the lack of studies which examine the relation between sentiment and capital structure decisions. To our best knowledge, this thesis will be the first study which examine the relation between both investor and managerial sentiment with capital structure decision for the Turkish sample.

This thesis consists of three chapters and conclusion. The first chapter which is onto Capital Structure begins with Capital Structure Theories and continues with the explanation of its determinants. Additionally, related empirical studies have been mentioned in Chapter 1. Behavioral Finance and sentiment have been explained in Chapter 2. The related literature review has been discussed in Chapter 2. The last chapter, Data and Methodology, assert the methodology, data and the empirical findings of the study. Conclusion brings to an end the results and discusses empirical findings.

CHAPTER 1

CAPITAL STRUCTURE

Main purpose of firms is to maximize shareholder wealth which is closely related to firm value. Free cash flow and weighted average cost of capital are its main components. In this regard, the costs of the capital components, namely debt and equity, used to finance operations play a crucial role due to their effect on both free cash flows and cost of capital.

Firms can obtain the needed capital through debt or equity financing. Proportion of debt and equity financing in total capital is named as capital structure (Brigham and Ehrhardt, 2005:547). While debt capital can be raised from external sources such as banks or bond issues; equity capital can be obtained from external sources in the form of new equity issuance as well as internally in the form of retained earnings. Both debt and equity financing have some advantages and disadvantages, hence in capital structure decisions, the pros and cons of both should be carefully evaluated.

Research on capital structure has developed different theories on the topic however; the question of optimal capital structure still remains a puzzle. This chapter aims to explain first the theories on capital structure and then discuss the empirical research on its determinants.

1.1 CAPITAL STRUCTURE THEORIES

Capital structure literature embodies various theories such as Irrelevance Theory, Static and Dynamic Tradeoff Theory, Pecking Order Theory, Signaling Theory and Market Timing Theory. Each theory is explained in this section.

1.1.1 Irrelevance Theory

Modigliani and Miller (1958), in their Nobel Prize winning study, put forth the Irrelevance Theory of Capital Structure. They argue that the value of a firm is

unrelated to its capital structure that is the value of a firm which has no debt equals to the value of a levered firm which has debt (Modigliani and Miller, 1958: 268).

They assume that there are no corporate or personal taxes, no transaction costs, investing and financing decisions are independent of each other and financial markets are efficient (Modigliani and Miller, 1958: 273). Hence both insiders and outsiders have the same information at the same time.

The Irrelevance Theory put forth the following propositions (Modigliani and Miller, 1958:270-271):

Proposition 1a:

$$V_L = V_U$$

Where V_L denotes the value of a levered firm whereas V_U is the value of the unlevered firm.

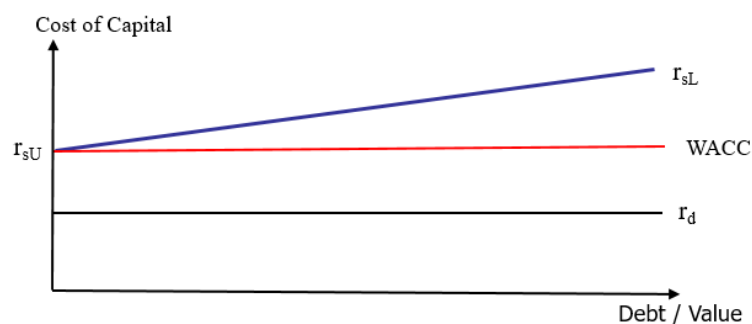
Proposition 1b:

$$r_{sL} = r_{sU} + \frac{\text{Debt}}{\text{Equity}}(r_{sU} - r_d)$$

where; r_{sL} , r_{sU} and r_d denote cost of levered equity, cost of unlevered equity and cost of debt, respectively.

Based on Modigliani and Miller's Propositions 1a and 1b, as Figure 1 exhibits, when the debt level increases, cost of equity increases; the firms become riskier with increasing debt level. However, lower cost of debt financing covers the increase in cost of equity financing herewith weighted average cost of capital (WACC) remains constant (Brigham and Ehrhardt, 2005:585).

Figure 1: Modigliani and Miller Propositions



Source: Brigham & Ehrhardt, 2005: 590

Modigliani and Miller (1963) included corporate taxes into their analysis extending their 1958 study. Since interest payments can be deducted from taxes, the amount of tax paid to the government goes down as debt increases leading to more cash for the firms (Brigham & Ehrhardt, 2005:558). Modigliani and Miller (1963) argue that the tax shield provided by debt financing increases the value of the firm. Each dollar which is borrowed creates additional value to the firm as much as the tax rate and this view leads to the conclusion that optimal capital structure should contain almost hundred percent debt.

Modigliani and Miller's (1963:436-437) Proposition 1a with corporate taxes implies that:

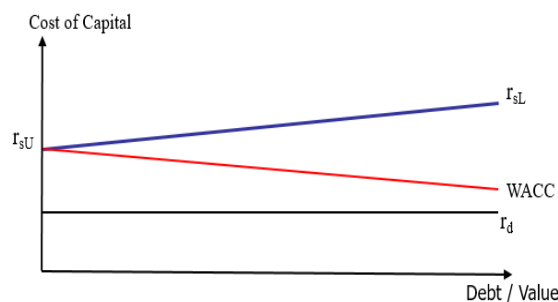
$$V_L = V_U + (\text{Corporate Tax Rate} \times \text{Debt})$$

Proposition 1b with corporate taxes becomes:

$$r_{sL} = r_{sU} + \frac{\text{Debt}}{\text{Equity}}(r_{sU} - r_d)(1 - \text{Corporate Tax Rate})$$

As shown in Figure 2, Modigliani and Miller (1963) also state that cost of equity increases when debt level goes up, but WACC goes down, because lower cost of debt coupled with its tax advantage exceeds the increase in the cost of equity.

Figure 2: Modigliani and Miller Propositions with Corporate Tax



Source: Brigham and Ehrhardt, 2005: 590

Miller (1977) further extended the Modigliani and Miller's (1963) study by including personal income taxes that they had ignored in their previous studies. The study evaluated the effects of corporate and personal taxes on firm value and cost of capital. Both firms and individuals have tax liability. Investors are subject to pay two

types of tax; personal tax on bond returns and personal tax on stock returns. When the firms decide interest rates of bonds that they will issue, they should take into consideration the tax rate that investors will pay on the return of bonds in order to encourage investors to buy bonds. Firms decrease corporate tax payments by using debt financing, but personal income taxes increase due to bond returns.

Dividend payments are rendered from net income- after interest and corporate taxes are paid. If common stockholders are provided dividend payments, they are obligated to pay personal taxes off of this amount. Thus, dividend payments are taxed twice; at the corporate and personal levels. Personal taxes do not fully remove the tax advantage of debt, but instead decrease it (Brigham and Ehrhardt, 2005: 559). As shown by Miller (1977:267) by the equation below, the personal tax on bonds and stocks will reduce the present value of the tax shield due to double taxation of dividend payments.

$$V_U = \frac{EBIT (1 - \text{Tax rate})}{r_{sU}} = \frac{EBIT (1 - \text{Tax Rate})(1 - \text{Personal Tax Rate})}{r_{sU}(1 - \text{Personal Tax Rate})}$$

where; EBIT denotes earnings before interest and taxes, V_U the value of the unlevered firm and r_{sU} the cost of equity of the unlevered firm.

1.1.2 Static Tradeoff Theory

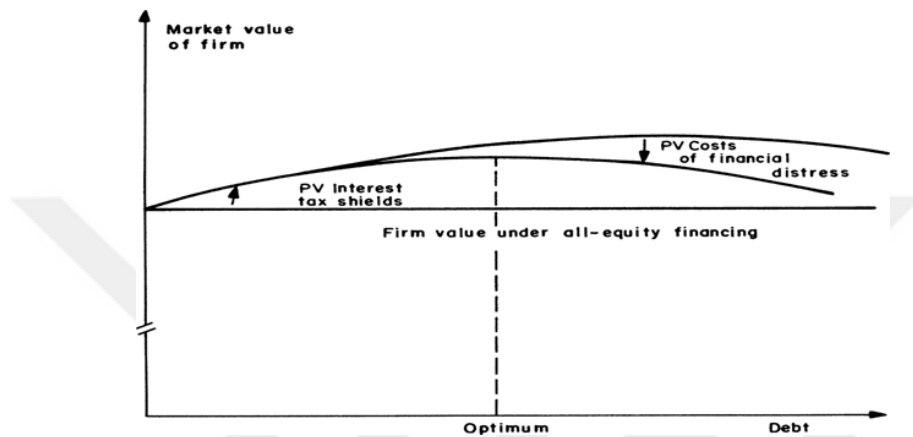
Myers (1984) amends Modigliani and Miller's Irrelevance Theory (1963) and develops the Static Tradeoff Theory which argues that there is an optimal capital structure. At this point, the firm has optimal level of debt, and its value is at its highest level whereas its weighted average cost of capital is at its minimum.

According to the Static Tradeoff Theory, at the optimal capital structure the costs of debt and tax advantage of debt are offset (balanced). The cost of debt does not only include interest payments but also the financial distress and bankruptcy costs. Debt decreases tax liability of the firm creating a tax shield, but at the same time increases the probability of default and financial distress (Myers, 1984: 577).

As shown in Figure 3 when an all equity firm initially starts borrowing, the benefits of debt are greater than the costs of debt increasing the firm value.

However, beyond the optimal level of debt, the firm value goes down because the increasing financial distress costs exceed the tax advantage created by debt. Financial distress may cause a decline in firm value by increasing the probability of bankruptcy leading to higher bankruptcy and financial distress costs (Myers, 1984: 577).

Figure 3: The Static Tradeoff Theory of Capital Structure



Source: Myers, 1984:577

1.1.3 Dynamic Tradeoff Theory

Dynamic Tradeoff Theory is the amended version of Static Tradeoff Theory. Fischer et al. (1989) add transaction costs to the theory which firms face when they change their capital structures. The theory suggests that there are changing target capital structures for different periods and firms reach the target by changing leverage ratios. Firms have minimum and maximum leverage ratio limits. As Jensen (1986: 324) argues firms target maximum debt level due to the tax advantage of debt in addition to its advantage of restricting the amount of free cash flow available to managers for spending for their own interests reducing agency costs. Otherwise, firms have an upper limit for debt in order to avoid financial distress and bankruptcy costs (Jensen, 1986: 324).

In order to keep the leverage ratio within a certain range, as the firms' profit increases and more earnings are retained in the firm, the proportion of debt in the capital structure will go down; when the debt level reaches a minimum level, the debt

level is increased. If a firm does not have enough profit to meet its financing needs, the firms must issue debt. When the leverage ratio reaches a maximum point, the firm issues equity to decrease the leverage ratio. When the firms carry out these transactions to keep the leverage ratio between minimum and maximum levels, they have to bear the adjustment costs. Without these types of costs, firms can change their capital structure immediately when capital structure deviates from the optimal level, however; owing to adjustment costs debt level is only changed when it reaches the critical level (Fischer et al., 1989).

1.1.4 Pecking Order Theory

Contrary to Modigliani and Miller's (1958) assumption of market efficiency where everyone has the same information at the same time, Pecking Order Theory of Myers (1984) and Myers and Majluf (1984:15) based its argument on the information asymmetry between managers and shareholders.

In the organizational structure of firms where professional managers are hired rather than owner-managers, additional costs and conflicts of interests arise. Jensen and Meckling (1976) define those types of costs as agency costs. They argue that managers could potentially make decisions to benefit themselves contrary to the interests of the shareholders. The decrease on the owners' wealth caused by managers perk consumption, is a type of agency cost- also referred to as residual loss (Jensen and Meckling, 1976:5-6).

The fact that managers have more knowledge about the firm than investors (existing shareholders, potential investors and creditors) is called as information asymmetry (Gitman and Zutter, 2010:533). Pecking Order Theory proposes that firms choose the financing method according to a certain order in order to minimize financing costs in asymmetric information context.

Pecking Order Theory states that firms use external financing when retained earnings are insufficient. External financing -issuing debt or issuing equity- include the obligation of sharing special information about the firm with outsiders. If new equity issue is chosen, managers have to share the special information with the market, as issuing debt with creditors.

When the firms issue equity, investors perceive the stocks of the firm to be overvalued and believe that managers are aiming to take advantage of this situation. Hence potential investors avoid buying the stocks and leading to a decrease in the current stock price (Myers and Majluf, 1984). However, by using internal finance sources, namely retained earnings, the managers avoid the decrease in stock prices and at the same time raise equity capital (Harris and Raviv, 1991:308).

According to Myers (1984:583-584), another possible reason not to issue equity is to avoid the issue of undervalued shares. If a firm issues undervalued shares to finance a positive net present value (NPV) project that will increase the value of the firm- the new shareholders who buy the undervalued shares will benefit from this situation. However, existing shareholders will suffer from earnings per share dilution owing to the increasing number of shares.

Pecking Order Theory disavows the existence of the optimal capital structure that is claimed under The Static Tradeoff Theory. According to Myers (1984:581) and Myers and Majluf (1984:191), firms prefer internal financing (retained earnings) as the first option and then debt financing; equity financing is preferred as the last resort. Each firm requires different levels of external financing. Most profitable firms may not need external financing, because they are capable of creating funds by retaining their earnings in the firm by not distributing them as dividends (Myers, 1984:581). Based on the Pecking Order Theory, if firms need external financing, they prefer issuing debt to equity to take advantage of lower cost and tax shield of debt financing and avoid earnings per share dilution. Firms issue equity as a last resort when they currently have high amount of debt and the incurrence of any additional debt is very costly (Myers, 1984:585).

On the other hand, Wang and Lin (2010), Fourati and Affes (2013) and Fulghieri et al. (2014) put forth empirical evidence which support the reversed pecking order choices. Wang and Lin (2010) showed that there are reversed pecking order choices on specific situations. For instance, when a firm's project is useless, possibility of going bankrupt is higher owing to lower cash flow when the firm uses debt financing rather than issuing equity (Wang and Lin, 2010:399). That is why firms could be inclined to issue equity rather than debt inconsistent with Pecking Order Theory.

The logistic regression results of Fourati and Affes (2013:251) put forth that there is reversed Pecking Order choices for newly established firms which have access to more external sources than internal sources. In the case of the opacity of information, the results show that issuing equity is preferred to issuing debt (Fourati and Affes, 2013:251).

Fulghieri et al. (2014:22) argue that equity financing outweigh debt financing when the firm has growth opportunities which means higher investment requirement.

1.1.5 Signaling Theory

According to the Efficient Market Hypothesis of Fama (1970), investors and managers of the firms possess the same information about the firm at the same time. However, due to information asymmetry managers have more information than investors. Signaling Theory, which stems from this information asymmetry in the market, is first introduced by Ross (1977). This theory argues that managers of the firms possess special information that investors do not have when making capital structure decisions and send a signal to the market with their actions (Ross, 1977: 27).

Signaling Theory supposes that if firms issue equity, then the potential investors interpret this action as the managers' expectation of low profits or loss in the near future and managers want to share the unfavorable situation with the new shareholders. If the firm has a positive NPV investment opportunity, existing shareholders would not want to share its positive returns with the new shareholders. However, if a firm uses debt financing it can be considered as a favorable signal of investing in a project that has positive returns. High level of debt means that managers have confidence in the firm's projects and future cash flows and the firm is perceived as high quality by potential investors. Moreover, using debt financing is preferred by managers and existing shareholders to avoid dilution of earnings, when they do not want to share positive returns of the investment with new shareholders (Ross, 1977: 30-31).

In addition, Myers and Majluf (1984: 14) state that issuing equity can be perceived by investors that the firm's stocks are overvalued by the market and managers of the firm want to take advantage of this situation.

Information asymmetry in the market prompts potential investors to deduce from the financing type used by the firms about financial expectations of the firms. Financing type is perceived in the market as a signal. If a firm issues equity, potential investors think that the firm does not have positive return investment opportunities and the existing investors want to share their loss. This is taken as a negative signal by the market. However, when the firm uses debt financing, it has a positive impression on the market as expecting positive returns from an investment. Moreover, a firm that is able to use debt financing is perceived by investors as financially strong hence is perceived as a positive signal (Brigham and Ehrhardt, 2005: 561-562).

1.1.6 Market Timing Theory

Market Timing Theory, contrary to previously explained theories, does not attend to choice of debt or equity financing; the theory focuses on the timing of capital structure decisions. Baker and Wurgler (2002: 2) claim that capital structure decisions are strongly correlated with past market values and the empirical results of their study is in concordance with their claim. They find that capital structure decisions are affected by historical market prices. According to the results of their study, Baker and Wurgler (2002:3) argue that capital structure is that the additive outcome aiming at making decisions on the equity market in time. According to Market Timing Theory market prices is the determining factor to be used in equity financing and firms tend to issue common stock when their stocks are overvalued in the market and repurchase the stocks when stock prices are low (Baker and Wurgler, 2002: 27).

Graham and Harvey (2001: 232) put forth that Chief Financial Officers (CFO) regard stock prices -in terms of issuing equity- as one of the most important factors out of ten factors presented in their questionnaire which was applied to three hundred ninety two CFOs. According to Taggart (1977: 1473), the market value of

debt and equity are crucial determinants in the equity issue decision. Firms use debt financing when the market value of the firm is low and issue common stock when the market value is high. Especially, firms tend to issue equity just before the low market return period. Firms prefer debt financing rather than equity financing when the stock prices are low.

1.2 DETERMINANTS OF CAPITAL STRUCTURE

While optimal capital structure is still an unsolved issue, the factors affecting capital structure decisions continue to be a research interest for many finance researchers. In this part, the determinants of capital structure are discussed under two headings, as Firm Specific Determinants and Macro Economic Determinants.

1.2.1 Firm Specific Determinants

As shown in Table 1 in summary and in Appendix 1 in detail, the main firm specific determinants of capital structure decisions can be listed as firm size, profitability, tangibility of assets, growth opportunities, tax shield and non-debt tax shield. The table also presents the expected relationship between these factors and the debt level of a firm based on the literature covered in this part and the aforementioned theories.

Table 1:Expected Relation of Firm Specific Determinants with Debt Level

	Variable	Theory	Expected Relation with Debt Level
Firm-specific Factors	Firm Size	Trade-off Theory	+
		Pecking Order Theory	-
	Profitability	Trade-off Theory	+
		Pecking Order Theory	-
		Signaling Theory	+
	Tangibility of Assets	Trade-off Theory	+
		Pecking Order Theory	+
	Growth	Trade-off Theory	-
		Pecking Order Theory	+
	Tax	Trade-off Theory	+
	Non-debt Tax Shield	Trade-off Theory	-
		Pecking Order Theory	-

1.2.1.1 Firm Size

Tradeoff Theory supposes that there is a positive relationship between firm size and debt level, while the relationship between firm size and bankruptcy risk is inversed. Titman and Wessel (1988:6) suggest that large firms are less likely to go bankrupt as they have more diversified capital structures which means consisting of different types of financing instruments. Big firms can get debt or issue equity with more favorable terms than small firms. Small firms have to bear higher costs for additional funds. Thus, small firms firstly use equity financing if extra funds are needed followed by short-term debt due to lower cost of short term borrowing. Hence, the debt levels of big firms will be higher based on the arguments of the Tradeoff Theory as depicted in Table 1.

Whereas Pecking Order Theory supposes that firms firstly prefer internal sources to finance its investments. It accepts that there is a negative relationship between firm size and debt level. Firms increase the percentage of equity capital by using retained earnings as the first source of financing which decreases the debt ratio in the capital structure. From a different viewpoint, investors can more easily reach the information of large firms and this reduces information asymmetry. But this situation is not possible for small firms. Therefore, large firms can issue informationally more sensitive equity which decreases their debt levels and they could prefer equity financing if they already have high levels of debt when compared to small firms (Drobetz and Fix, 2003:15).

Trade-off Theory and Pecking Order Theory put forth counter-views regarding the effect of firm size on the financing type. However, empirical results of researchers are generally in compliance with the Trade-off Theory, and provide evidence of a positive relationship between firm size and debt level.

Friend and Lang (1988) proved that bigger firms have higher debt levels than small firms since bigger firms can get debt more easily than small firms. Also Fama and French (2002) find a positive relation between leverage and firm size in their study which uses non-financial American firms' data for the 1965-1999 periods.

According to the empirical results of Titman and Wessels (1988), small firms have more short-term debt than bigger firms. They argue that high interest rates of

long-term debt and high issuance costs of equity for small firms may cause this situation (Titman and Wessels, 1988:14).

Frank and Goyal (2003) propose that firm size has a significant impact on the debt level of the firms. According to the empirical results of their study, which examines US firms for the years between 1971 and 1998, while bigger firms behave in accordance with Pecking Order Theory's arguments, small firms do not (Frank and Goyal, 2003:237).

Another study of Frank and Goyal (2009), in compliance with Trade-off Theory, put forward that a positive and statistically significant relation between firm size and market-based leverage exists based on data of publicly traded US firms from 1950 to 2003.

Rajan and Zingales (1995) in their study, selected G7 countries as their sample, and found a positive relation between firm size and leverage except for Germany. Similarly, Chen et al. (1999) and Wiwattanakantang (1999) find a positive relation between firm size and leverage for Dutch listed firms and Thailand listed firms, respectively.

According to Bevan and Danbolt (2000) there is a positive and significant relation between firm size and long-term debt for UK firms. However, they find a significant negative relation between firm size and short-term debt level. The authors attribute the negative relationship of short-term debt level and firm size to the difficulty of long-term borrowing by small firms as Friend and Lang (1988) and Titman and Wessels (1988) argue.

Colombo (2001), examines the capital structure determinants of Hungarian firms, using the logarithms of sales and the level of employment as firm size proxy, finds positive relation between firm size and debt level for both proxies. However, the empirical results when number of employees is used as firm size proxy are only significant for the years of 1992 and 1995.

While Chen (2004) finds highly significant negative relation between firm size and long-term debt level; Huang and Song (2006) find a positive and significant relation between firm size and debt level for Chinese listed firms. Chen (2004: 1347-1348) argues that this negative relation may be due to country specific reasons such as market capitalization or state control level.

Bauer (2004), and Hanousek and Shamshur (2011) find a positive relation between firm size and leverage for the Czech Republic and Eastern European Countries sample, respectively.

Drobetz and Fix (2013), consistent with large firms have lower bankruptcy risk argument of Tradeoff Theory; find a positive relation between firm size and leverage for non-financial firms in the Swiss Performance Index.

Durukan (1997), Sayilgan et al. (2006), Demirhan (2009), Terim and Kayalı (2009), Ata and Ağ (2010), Okuyan and Taşçı (2010),Yakar (2011), Köksal and Orman (2015) and Akay and Efsun (2015)find a positive relation between firm size and financial leverage in their studies which investigate the capital structure determinants on the firms listed on Borsa Istanbul (BIST).Sayilgan and Uysal (2011), finds supporting evidence using Turkish Central Bank Industrial Balance Sheets survey data set.

Dağlı (1998) finds a positive relation between firm size and total debt level and long-term debt level, while he finds a negative relation between firm size and short-term debt level in his study which uses Turkish listed firms' data.

On the other hand, Mandacı (2009), Acaravcı (2015), Burucu and Öndeş (2016) and Güner (2016), in compliance with Pecking Order Theory, find a negative significant relation between firm size and debt level for publicly traded Turkish firms.

Irk and Karaca (2015) find insignificant relation between firm size and debt level for Turkish data.

1.2.1.2 Profitability

There are different arguments about the relationship between profitability and the debt level. As exhibited in Table 1, while Pecking Order Theory puts forth a negative relationship between profitability and debt level; Trade-off Theory and Signaling Theory suppose a positive relationship.

According to Pecking Order Theory, most profitable firms have enough retained earnings to finance their investment opportunities and they do not need any external funds. Firms only prefer external financing when the cost of the investment

exceeds their retained earnings (Myers, 1984: 585). Hence, Pecking Order Theory suggests that a negative relationship between debt level and profitability of a firm holds.

On the other hand, according to the Trade-off Theory, higher profit means higher tax liability and lower bankruptcy costs, therefore profitable firms prefer to use debt financing to take advantage of tax deductibility of interest payments (Myers, 1993:6).

Alike Trade-off Theory, Signaling Theory accepts the positive relationship between debt level and profitability. Under the assumptions of Signaling Theory, higher debt level sends a positive signal to the market (Ross, 1977: 29).

Myers and Majluf (1984: 6) accept that firms follow Pecking Order Theory and firms should firstly use internal sources when additional financing is required. If a firm is profitable enough, the firm would not require any external financing. The expectation of negative relation between profitability and debt level can be deduced from the conclusion of Myers and Majluf (1984: 46).

Friend and Lang (1988), Hovakimian et al. (2001), Fama and French (2002) and Frank and Goyal (2009) find a negative and significant relation between leverage and profitability of the publicly traded US firms for the periods of 1979-1983, 1979-1997, 1965-1999 and 1950-2003, respectively.

Rajan and Zingales (1995) in their study on G7 countries find a negative relation between profitability and leverage except for Germany. In addition, profitability variable is found insignificant for the French firms.

Chen et al. (1999) find a negative relation between profitability and leverage for Dutch companies.

Empirical results of Wiwattanakantang (1999) show that profitability has statistically significant negative impact on leverage for non-financial Thai Firms.

Booth et al. (2001) examines capital structure determinants for ten developing countries and find that profitability has a negative relation with debt ratio which is consistent with Pecking Order Theory.

Bevan and Danbolt (2000) and Özkan (2001) provide empirical evidence that support the negative relation between profitability and debt level for the UK firms.

Drobetz and Fix (2003) and Bauer (2004), consistent with Pecking Order Theory, find a negative relation between profitability and leverage for Swiss firms and Czech listed firms, respectively.

Chen (2004) and Huang and Song (2006) find a negative and statistically significant relation between profitability and both total leverage and long-term leverage for publicly traded Chinese firms.

Hall et al. (2004) find a significant negative relation between short-term debt level and profitability for the UK, Italy, Germany and Belgium. On the other hand, they find an insignificant negative relation between long-term debt level and profitability.

Chen and Chen (2011) find supportive results for Pecking Order Theory among Taiwan firms. This study puts forth that profitable firms mostly prefer internal financing instead of external financing.

Malinić et al. (2013) find a weak negative relation between profitability and debt level for Serbian firms for the 2008-2011 periods. The relation is significant at the 5% level.

The studies in Turkey generally have consistent results in terms of the relation between profitability and leverage. Durukan (1997), Dağlı (1998), Acaravcı (2015), Sayılğan et al. (2006), Çağlayan (2006), Şen and Oruç (2008), Demirhan (2009), Mandacı (2009), Yakar (2011), Köksal and Orman (2015), Abdioğlu and Deniz (2015), Akay and Efsun (2015), Burucu and Öndeş (2016), Güner (2016) and Dinçergök (2017) in compliance with Pecking Order Theory, find a negative relation between profitability and leverage in their studies which investigate the capital structure determinant of the firms listed on Borsa Istanbul. However, empirical results of Dağlı (1998) put forth a insignificant relationship between profitability and short term debt.

Unlike all other studies, Sayılğan and Uysal (2011) find a positive relationship using Turkish firms' balance sheet data. Terim and Kayalı (2009) find a negative relation between profitability and debt level except the years of 2003 and 2004. The relation between profitability and debt level for the years of 2003 and 2004 is positive and statistically significant.

1.2.1.3 Tangibility of Assets

According to Myers and Majluf (1984: 5-6), there is information asymmetry between outside investors and managers of the firm and this situation increases the cost of using external financing. Firms may lower the cost of borrowing by supplying their tangible assets as collateral. If a firm does not have collateralized assets, it is expected to accept more strict terms to get debt. Thus, firms that do not have enough tangible assets to collateralize tend to issue equity rather than using debt financing based on the arguments of the Pecking Order Theory as depicted at Table 1.

Trade-off Theory expects a positive relationship between tangibility of assets and debt level of a firm due to low financial distress that has high level of tangible assets. If a firm has more tangible assets, the firm has more power to get collateralized debt with lower costs (Myers, 1984: 581).

Friend and Lang (1988) and Frank and Goyal (2009) have found significant positive relation between ratio of net property, plant, and equipment to book assets and debt level for US firms.

According to empirical results of the study of Rajan and Zingales (1995) which selects G7 countries as its sample, tangibility of assets and debt level are positively related. Contrary to the findings for the firms in developed countries, Cornelli et al. (1998) determine a negative and significant relation between tangible assets and debt level for non-financial Hungarian and Polish firms.

Chen et al. (1999) and Wiwattanakantang (1999) ascertain a positive relation between debt level and tangibility of assets for Dutch firms and Thai firms respectively.

Bevan and Danbolt (2000) find a positive relation between tangibility of assets and long-term debt while they find a negative relation between tangibility of assets and short-term debt for UK firms.

According to Booth et al. (2001), asset tangibility has a different impact on total debt and long term debt. If a firm has more tangible assets, the firm has higher long term debt ratio; but its total debt ratio is lower for developing countries.

Colombo (2001) finds a statistically significant positive relation between asset tangibility and debt level excluding the year of 1995 for Hungarian firms.

Drobetz and Fix's (2003) empirical results show that asset tangibility and debt level are positively related for Swiss firms.

While the empirical results of Chen (2004) put forth the existence of significant positive relation between asset tangibility and long-term leverage, Huang and Song (2006) find a positive relation between asset tangibility and total and long-term leverage at 1% significance level for Chinese firms.

On the contrary, Bauer (2004), in his study which examines Czech Republic firms, finds a negative relation between tangibility of assets and leverage.

Empirical results of Hall et al. (2004) show that positive and significant relation between asset tangibility and long-term leverage in their study which analyzes eight European countries.

Chen and Chen (2011) find statistically insignificant positive relation between capital structure and asset tangibility for Taiwanese firms.

Malinić et al. (2013) find a significant negative relation between asset tangibility and debt level for Serbian firms. According to the authors, inverse relation may be caused by the tendency to finance fixed assets with most secure ways such as; internal sources or equity financing that generates lower debt proportion over equity. Another possible reason suggested is country specifics (Malinić et al., 2013:112).

Dağlı (1998) finds a positive relation between tangibility and total debt level and short-term debt level for Turkish firms. Empirical results of the study put forth an insignificant relation between long-term debt and tangibility of assets.

According to the empirical results of Mandacı (2009), and Okuyan and Taşçı (2010) there is a positive relation between tangibility of assets and long-term debt level, negative relation between tangibility of assets and short-term and total debt level for Turkish firms. In support of these studies, Irk and Karaca (2015) find a negative and significant relation between asset tangibility and short-term and total debt level for the years of 2000-2010. However, Irk and Karaca (2015) find an insignificant relation between long-term debt level and asset structure.

Sayılğan and Uysal (2011) using Turkish Central Bank Industrial Balance Sheets survey data set find a positive relation between tangibility of assets and debt

level. In addition, Akay and Efsun (2015) find a positive relation between tangibility and debt level for Turkish firms.

Sayılğan et al. (2006), Demirhan (2009), Terim and Kayalı (2009), Abdioğlu and Deniz (2015), Acaravcı (2015) and Burucu and Öndeş (2016), on the contrary to Tradeoff Theory and Pecking Order Theory, find a negative relation between tangibility of assets and debt level for publicly traded Turkish firms.

1.2.1.4 Growth Opportunities

As Myers (1977:30) stated growing firms are inclined to keep their debt levels as low as possible in order not to forego profitable investment opportunities, as current high levels of debt burden the firm (Huang and Song, 2006:29). In the case of having higher amount of debt, in connection with increasing financial distress and default risk, issuing additional debt will be more costly and managers choose not to issue any additional debt. This may cause passing up a positive NPV project. Accordingly, Tradeoff Theory expects that there is a negative relation between leverage and growth opportunities of a firm.

However, growing firms are considered to have more investment opportunities and need external resources for investment since internal sources will be inadequate to finance new investments. Based on the Pecking Order Theory, which accepts debt as the next source of financing after internal sources, the relation between growth opportunities and debt level is expected to be positive. Jensen and Meckling (1976: 52) and Myers (1977: 5) propose that firms with high growth rates will get less or shorter-term debt to reduce agency costs.

Rajan and Zingales (1995) have used market-to-book ratio as a proxy for growth opportunities. Results of their study show that there is a negative relation between growth opportunities and leverage. Supporting their results, according to the empirical results of Özkan (2001) and Drobetz and Fix (2003), which examine UK data and Swiss data respectively, firms with higher market-to-book ratio, have lower debt level. Frank and Goyal (2009) in accordance with Trade-off Theory find a strong negative relation between market-to-book ratio which is used as a proxy for growth opportunities and market-based leverage for American firms.

Chen et al. (1999) find a positive but statistically insignificant relation between growth opportunities and leverage for Dutch firms.

Empirical results of Bevan and Danbolt (2000) show that growth opportunities and debt level are positively related for non-financial UK firms.

Bauer (2004) results, in line with the findings of the studies on developed countries, present a negative relation between growth opportunities and market-based leverage for a developing country, the Czech Republic firms.

Chen (2004) present supporting evidence of a positive relation between growth opportunities and debt level; however, Huang and Song (2006) find a negative relation between leverage and growth opportunities in their study which employs Tobin's Q as a proxy for growth opportunities for publicly traded Chinese firms.

Hall et al. (2004) find a positive relation between growth and long-term debt level for Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal and the UK sample, but the results are significant only for Spain.

Barclay and Smith (2005) propose that there is a negative relation between market-to-book ratio and debt level. Moreover, growing firms which have higher market-to-book ratio are inclined to have lower long-term debt levels than the firms which have less growth opportunities.

Chen and Chen (2011) find a significant positive relation between growth opportunities and leverage for Taiwanese firms. According to the authors, growth obliges firms to get debt due to the inadequacy of retained earnings to finance new investments.

Empirical results of Malinić et al. (2013) show that there is a significant positive relation between growth opportunities of Serbian firms and their debt levels for the years of 2008-2011.

Sayilgan et al. (2006) use two different proxies for growth opportunities; first one is total assets, the other is plant, property and equipment. The empirical results of the study put forth that there is a positive relation between growth opportunities in total assets and debt level. However, they find a negative relation when growth opportunities in plant, property and equipment are used.

Köksal and Orman (2015: 273) state a positive relation between growth opportunities and long-term debt level for Turkish manufacturing firms. However, empirical results of Irk and Karaca (2015) provide evidence for positive relations between growth and short-term and total debt levels.

While Ata and Ağ (2010), Akay and Efsun (2015), Güner (2016) and Dinçergök (2017) find a negative relation between growth opportunities and debt level; Mandacı (2009), Okuyan and Taşçı (2010), Sayılğan and Uysal (2011), Acaravcı (2015) and Burucu and Öndeş (2016) put forth that growth opportunities have positive impact on the debt levels for Turkish firms. Demirhan (2009), and Abdioğlu and Deniz (2015) find insignificant results regarding the relation between growth opportunities and debt level for Turkish firms. Durukan (1997) find a positive relation significant at the 5% level between the growth rate and debt level for Turkish firms.

1.2.1.5 Tax

From the Trade-off Theory point of view, due to deductibility of interest payments from taxes, higher tax rates cause higher debt levels creating a higher tax shield.

Huang and Song (2006) find a positive relation between tax rate and long-term and total debt ratio in line with the Trade-off Theory.

Despite theoretical expectations of a positive relation between tax and leverage, empirical findings of Bancel and Mittoo (2004) and Bauer (2004) are not supportive.

Moreover, Michaelas et al. (1999) find statistically insignificant results about the relation between tax rate and debt level in their study which analyzes capital structure determinants of small and medium sized enterprises in the UK.

Mokhova and Zinecker (2013) find a negative relation between tax rate and total debt for Hungarian firms. However, they find a positive relation between tax rate and debt level for both German and French data.

In the study, which examines the relation between tax rates and leverage on Borsa Istanbul firms for the years 1990-1995, Durukan (1997) provides supporting

evidence for a positive relation between tax rate and leverage. Demirhan (2009) and Irk and Karaca (2015), on the other hand, find insignificant results about the relation between tax rates and leverage on Borsa Istanbul firms.

1.2.1.6 Non-Debt Tax Shield

Tax shield is generally regarded as a factor that increases debt level of a firm. On the contrary, non-debt tax shield is argued that it has a negative relation with debt level in the finance literature as suggested by De Angelo and Masulis (1980:22). Firms have some other obligations besides debt that reduce their tax liabilities. In addition to tax shield arising from debt, depreciation and amortization, incentives and retained losses reduce tax liability of a firm which is named as non-debt tax shield (De Angelo and Masulis, 1980: 4). Bowen et al. (1982), Titman and Wessels (1988) and Fama and French (2002) show that a negative relation between debt levels and non-debt tax shield exists in accordance with De Angelo and Masulis (1980) proposition. However, Bradley et al. (1984) find a positive and significant relation between debt levels and non-debt tax shield, contrary to the negative relation expectations for the US firms.

Demirgüç-Kunt and Maksimovic (1994) find a negative relation between non-debt tax shield and total debt level for their sample, which is consisting of ten developing countries, except for Mexico. They discover a positive and significant relation for Mexico.

Wiwattanakantang (1999), in accordance with the argument that the non-debt tax shield is a substitute for debt argument, find a negative and significant relation between debt level and non-debt tax shield for Thai firms.

Miguel and Pindado (2001) find an inverse relation between non-debt tax shield and debt level for Spanish firms. According to this study, non-debt tax shield is a more important variable for Spanish firms than US firms due to higher non-debt tax shields of Spanish firms.

Özkan (2001) finds an inverse relation between non-debt tax shield and debt level in their study, which uses annual depreciation expense to total assets as a proxy for non-debt tax shield, for the UK firms.

While Drobetz and Fix (2003) find insignificant results in their study which uses Swiss firms, Bauer (2004) finds a negative relation between non-debt tax shield and leverage for the Czech Republic firms.

While Chen (2004) finds a statistically insignificant relation for Chinese firms for the years between 1995 and 2000, Huang and Song (2006) obtain an inverse relation between leverage of a firm and non-debt tax shield using Chinese data for the years 1994 to 2003.

Durukan (1997), Dağlı (1998), Sayılğan et al. (2006) and Sayılğan and Uysal (2011) provide supporting evidence of a significant negative relation between non-debt tax shield and debt level for Turkish firms. Terim and Kayalı (2009) find a negative relation between non-debt tax shield and debt level for Turkish firms except for the years of 2002 and 2003. On the contrary, Irk and Karaca (2015) put forth a positive relation between non-debt tax shield and debt level for Turkish firms whereas Demirhan (2009), Abdioglu and Deniz (2015) and Güner (2016) find a statistically insignificant relation.

1.2.2 Macro-Economic Determinants

Debt ratios of firms are affected by macro-economic factors with regard to country characteristics such as inflation rate, gross domestic product and financial markets (Booth et. al, 2011) as depicted in Appendix 2. There are limited number of studies which examine the relation between macro-economic factors and capital structure. The relation is unattended both globally and domestically.

1.2.2.1 Inflation

Inflation is defined as the increase of general level of prices (Frisch, 1983: 9). Also, it can be expressed as the depreciation of money or the falling value of money. Both stock and debt markets are negatively affected by high inflation rates (DeAngelo and Masulis, 1980).

According to the Trade-off Theory, expected inflation and debt levels are positively related; however Pecking Order Theory does not predict any relation

between inflation and capital structure decisions (Frank and Goyal, 2009). There is inconclusive evidence regarding the relation between inflation and capital structure choices in the finance literature.

According to De Angelo and Masulis (1980), inflation leads to a rise on debt level because it decreases the cost of debt while increasing the cost of equity, thus firms tend to issue debt during high inflation periods. Due to inflation, nominal revenues of the firms will increase and real value of debt will decrease (De Angelo and Masulis, 1980: 24).

Gajurel (2006) finds a negative relation between inflation and total debt ratio and the short term debt ratio but a positive relation between inflation and long term debt ratio in his study which examined the factors affecting capital structure decisions of Nepalese firms for the period 1995-2004.

According to Frank and Goyal (2009) empirical results put forth that high inflation expectation is positively related with market leverage.

While Bokpin (2009: 136) states that inflation increases the short term debt choice of firms over equity; Bastos et al. (2009) find that inflation does not affect the choice of financing type.

Qurat-ul-Ain et al. (2011: 21) state that when the inflation rate is high, firms prefer short term debt to keep away from high costs of long term debt. According to the empirical results of their study which examines the macro economic factors affecting capital structure decisions of Pakistani firms in 2003-2009, there is a negative relation between inflation rate and long term debt, however positive relation between inflation rate and short term debt ratio.

Mokhova and Zinecker (2013) found a strong negative relationship between inflation and debt ratio on manufacturing firms in the Czech Republic, while they find a positive relation for France for the years of 2006-2010.

Khanna et al. (2015) investigate the effect of inflation on capital structure choices within the Market Timing Theory framework in India, a developing economy. According to their findings, firms tend to use debt financing when inflation rate is high.

While Durukan (1997) find a statistically insignificant relation between inflation rate and capital structure, Köksal and Orman (2015), in accordance with

Trade-off Theory, find a positive relation between inflation and debt level in their study which examines leverage determinants of firms in Turkey.

1.2.2.2 Gross Domestic Product

Gross domestic product (GDP) can be defined as the monetary value of all the final goods and services that a country provides in a certain time (Case et al., 2012: 423). Increasing GDP is perceived as an indicator of economic growth and growth opportunities for firms. As mentioned previously, growth opportunities and debt level relation is expected to be negative by Tradeoff Theory while Pecking Order Theory expects positive relation between GDP and debt level. Therefore, expected relation between GDP and debt level may change for each study.

Gajurel (2006) consistent with Booth et al. (2001), find a negative relation between GDP growth and total debt and short-term debt while the relationship is found to be positive between GDP growth and long-term debt ratio. Jõeveer (2006) and Hanousek and Shamshur (2011) find a significant positive relation between GDP growth and leverage.

According to Bokpin (2009), increase in GDP per capita may show the increase in retained earnings through growth of firms. Bokpin (2009) finds a statistically significant negative relation between debt level and GDP per capita.

Köksal and Orman (2015) also provide supporting evidence of a negative relation between GDP growth and long-term leverage and total leverage for Turkish firms.

1.2.2.3 Financial Market Development Level

Financial markets are the mechanisms that provide fund flows between households, organizations or government who need additional funds and who have fund surplus (Gitman and Zutter, 2010:34). In developed countries, through deepening of capital markets and spreading of capital, small and medium sized companies as well as large scale companies are able to benefit from these markets. As the capital markets develop, the banking sector is affected positively, increasing

the credit opportunities and making it easier for small firms to reach this funding source (Güloğlu and Bekçioğlu, 2001). As Demirgüç-Kunt and Maksimovic (1999:303) state in nations with developed financial markets, there is a motivating force for firms to change from long term debt to equity.

Demirgüç-Kunt and Maksimovic (1995) investigate the impact of the level of development of financial markets on the capital structure, there is a negative relationship between stock market development and short-term and long-term leverage. However, they argue that this relationship applies only to large-scale firms (Demirgüç-Kunt and Maksimovic, 1995: 332).

Giannetti (2003:25), using Western European Countries data, states issuing equity is an alternative for long-term debt if a country has a developed stock market. Contrary to these findings, empirical results of Jøeveer (2006) put forth a negative significant relation between market capitalization and leverage for the Eastern European Countries data.

According to Gajurel (2006), the more developed financial markets are the more favorable issuing equity becomes.

Bokpin (2009) finds an insignificant relation between financial markets development level and leverage.

Köksal and Orman (2015) find significant negative relation between equity market size and leverage for Turkish firms.

CHAPTER 2

SENTIMENT

This chapter aims to explain sentiment as investor sentiment and managerial sentiment. First Behavioral Finance in relation to Traditional Finance is explained briefly. The heuristics and biases underlying Behavioral Finance theories are explained. Sentiment is explained in more detail and its relationship to capital structure decisions of firms is also discussed.

2.1 BEHAVIORAL FINANCE

Expected Utility Theory (EUT), which is first suggested by Bernoulli (1738) and improved by Neumann and Morgenstren (1944), is the underlying theory of Traditional Finance Literature. The theory assumes that people are rational and make choices according to the expected utility of options and they choose the option which has the highest expected utility. According to the assumptions of EUT, when people make decisions under risk they calculate the occurrence probability of the options through Bayes Theorem and they make decisions rationally (they do not have any biases) (Neumann and Morgenstren, 1944:9). EUT presumes that utility is a measurable concept and expected utility can be computed by multiplying the probable utility that is the result of a decision taken under risk by the possibility of occurrence (Neumann and Morgenstren, 1944:16-18).

$$p \cdot U(A) > q \cdot U(B)$$

Where the possibility of occurrence of A is p, B is q; and U is the utility function from the results of decisions. If option A provides higher utility than option B, the decision maker will definitely choose option A. Consistently, when B has higher utility than C, decision maker will choose B over C. Hence the decision makers will choose A if the choices are A, B and C. (Schoemaker, 1982:531; Bailey, 2005: 91-92). Additionally, the theory accepts that people are risk averse and this situation causes concavity of the utility function which is known as the principle of diminishing marginal utility (Bailey, 2005: 94).

Efficient Market Hypothesis (EMH), described by Fama (1970), argues that markets act efficiently and prices of all securities reflect all existing data and the market responds to new information as soon as possible. According to Fama (1970:384) if the prices in a market fully reflect all available information, it can be called as an efficient market.

EMH holds under the following assumptions (Fama, 1970: 386-388, 410; Fama, 1995: 76):

- Investors are rational and expect to maximize their utility
- Investors use all available data when they trade
- All information is accessible for all investors at the same time and free of charge and perceived by investors in the same way
- There are no commission or brokerage fees

EMH claims that getting over-normal returns is not possible in the efficient markets because the market prices already reflect all information. The only thing that can cause price changes in the market is new information. If the market is efficient, the intrinsic values of the securities are equal to their market price (Fama, 1976:144-145).

According to Traditional Finance Theories, prices are set based on the future cash flows of the financial instruments and their systematic risk levels. Irrational investors can not affect prices due to transactions of arbitrageurs which correct all mispricing. Hence, the market as a whole acts rationally and the prices follow a random walk.

Fama (1970:388) put forth three types of market efficiency: strong, semi-strong and weak form. In the strong form of market efficiency, EMH claims that stock prices cover all information which is historical, publicly available and private; whereas in semi-strong form efficiency, prices embody historical and publicly available information. In the weak form market efficiency, prices reflect only historical information (Fama, 1970: 414).

On the other hand, anomalies which are observed in the financial markets lead to the criticism of the Efficient Market Hypothesis. These anomalies, such as; seasonal and pricing anomalies show that there are deviations in the financial markets which affect prices of financial instruments, financial decisions and financial

markets; and indicate that the EMH's assumption of impossibility of beating the market is not realistic (Thaler, 1987:198; Shleifer and Vishny, 1997:51-52).

One of the most studied anomaly type is seasonal anomalies which are proved to exist in the financial markets by many researches. These types of anomalies occur hourly, daily, monthly, yearly or before/after specific periods. For instance, empirical evidence of French (1980) shows that Standard and Poor's index returns on Mondays are negative, other days are positive in addition Wednesdays and Fridays are highest for the years between 1953-1977. Balaban (1995), Özmen (1997) and Bildik (2000) find that Borsa Istanbul has the highest return in January for the periods of 1998-1993, 1988-1996 and 1988-1998 respectively.

Experimental researchers (Kahneman and Tversky, 1979) prove that people may not act rationally in the real world during the decision making process; they are affected by their life experiences, emotions and biases. For example, when people were asked to choose between getting \$4000 with 80% chance and getting a certain \$3000, although the expected utility of getting \$4000 with 80% chance is higher than the certain amount of \$3000, 80% of the participants accepted getting the certain \$3000 (Kahneman and Tversky, 1979:266).

The new approach to finance called Behavioral Finance, searching for explanations for the anomalies, basing its arguments on the study of Kahneman and Tversky, argues that people have emotions and personal characteristics that affect their decisions. It does not show how investors should behave, however tries to explain the reasons of the anomalies caused by investors' irrational decisions. Market anomalies, which cannot be explained by the Efficient Market Hypothesis and Traditional Financial Theories, are explained by Behavioral Finance.

In Behavioral Finance investors are not regarded as rational, they are regarded as normal. During the financial decision making process, people do not only consider risk and return but they are also affected by psychological, cognitive and emotional factors which may lead to irrational decisions.

Kahneman and Tversky (1979) also argue that people are not risk averse but loss averse. They attribute more weight to losses rather than gains. When the same amount of gain and loss are compared, they conclude that the effect of loss is more than the effect of gain (Kahneman and Tversky, 1979: 280).

Behavioral Finance which is regarded as an alternative paradigm for the Efficient Market Hypothesis is basically based on two main assumptions; first one is limits to arbitrage and the second is bounded rationality (Barberis and Thaler, 2003:1053).

The first assumption is the limits to arbitrage. Arbitrage can be defined as concurrent trade of same or similar assets in different markets in order to benefit from price differences (Civelek and Durukan, 2011: 335). This trade is vital for the efficiency of the capital markets, because it helps to eliminate irrational investors' effect on security prices (Shleifer and Vishny, 1997: 35). Behavioral Finance claims that arbitrage is risky and has limitations as the market anomalies and mispricing prove (De Long et al., 1990; 705; Shleifer and Vishny, 1997:53; Barberis and Thaler, 2003: 1058)

One factor which limits arbitrage is the existence of noise traders. Noise is defined as the opposite concept of information which increases transaction volume and frequency in financial markets (Black, 1986: 530). If all market participants have the same information, transaction volume will be low or there will be no trade (Black, 1986: 531). In this sense Black (1986: 530) states that with noise, financial markets being imperfect but possible. Investors, trading based on noise called as noise traders (Kyle, 1985; Black, 1986; DeLong et al., 1990), increase liquidity of the market by causing an increase in trade volume.

Noise traders are the irrational investors affected by biases, heuristics and emotions which cause mispricing of financial securities and affect the positions of information traders who act rational and force them to liquidate their positions (Black, 1986; De Long et al 1990: 705 and Shleifer and Vishny, 1997:53). These types of trading activities of investors cause mispricing of financial securities through increasing noise in price formation. For instance, when the noise traders are pessimistic, price of the financial security will decrease (De Long et al 1990:705) with no rational reason. Thus, rational arbitrageurs and noise traders meet up in the financial markets, and trades based on information will be profitable while noise traders lose money and pull out of the market (Black, 1986: 533; DeLong et al., 1990:704).

Transaction costs are the other factor which constrains arbitrage. In the real world, there are commissions, brokerage fees, bid-ask spread etc. which discourage investors from trading in financial markets even though an arbitrage opportunity arises (Barberis and Thaler, 2003:1057).

There are many examples that provide evidence to limits to arbitrage. One of the most significant examples is the Royal Dutch and Shell stocks which are known as twin shares (Froot and Dabora, 1998). In 1907, these companies have merged and 60% of the merged firm belonged to Royal Dutch and 40% belonged to Shell. According to the Traditional Finance Theories, price of the financial securities equals to fundamental value. Based on this assumption, Royal Dutch stock price must be equal to one and a half times Shell stock price. However, empirical findings of Froot and Dabora (1998: 193) show that there are deviations from the partnership rates.

The second assumption of Behavioral Finance is bounded rationality which is based on the acceptance of investors as social beings who are affected by psychological factors in their decisions. This situation leads to the anomalies in the financial markets. Human brain does not work like a machine; information is processed with emotions and some cognitive shortcuts, which are called as heuristics and hence humans are affected by biases. This situation causes differences between the decisions which are made with and without heuristics and biases (Tversky and Kahneman, 1974).

Theoretically Behavioral Finance emerged in an effort to explain the anomalies in the financial markets and decision making under uncertainty. Homo economicus investors as assumed by Traditional Finance Theories are fully rational. They take all available information into consideration during the decision making process and their choices are based on statistical principles in order to maximize wealth and they are risk averse (Sansar, 2016:137). However, the fact that these assumptions are unrealistic is supported by the irrational investor behaviors and market anomalies in the financial markets. According to Black (1986), investors give reaction not only to information but also to noise which is opposite to the concept of information. Additionally, market efficiency decreases with noise (Black, 1986:530).

2.2 HEURISTICS AND BIASES

There are many instances where emotions, rules of thumb, mental shortcuts and psychology influence the way people decide, causing people to behave in irrational ways. These are named as heuristics and biases.

2.1.1 Heuristics

Heuristics are generally defined as rules of thumb and mental shortcuts which lead to cognitive biases (Schwartz, 2010: 58). Shefrin (2002:14) states that heuristics make generating an estimated answer possible without using all available information. Tversky and Kahneman (1974) put forth three types of heuristics: availability, representativeness, and adjustment and anchoring.

Availability heuristic states that people give more weight to the information that come to their mind more easily. Easily remembered things are thought as more common contrary to statistical data (Tversky and Kahneman, 1974:1127-1128).

For instance, in the study of Tversky and Kahneman (1974) people were asked if a word is chosen from an English text, whether the probability that the selected word starting with R is higher than the probability that its third letter is R. Although there are more words whose third letter is R in English language, people answered that the selected word starts with R is more probable (Tversky and Kahneman, 1974:1127).

Representativeness heuristic is defined as tendency to disregard the characteristics of the distribution of the population when making a decision while concentrating on the latest and most memorable and extraordinary factors (Tversky and Kahneman, 1974:1124). Representativeness heuristic causes people to perceive small samples as representatives of the main population (Tversky and Kahneman, 1974:1125).

Representativeness heuristic is tested by a questionnaire by Tversky and Kahneman (1974). People were asked to state the probability of a person, selected from a sample which includes 30 lawyers and 70 engineers, being a lawyer. Based on the probability calculation the person selected from the sample being a lawyer is 30%

and being an engineer is 70%. On the other hand, when participants were told that the selected person is 30 years old, married and childless, talented and has high level of motivation and the question was asked again, the participants disregarded the base rate (30% lawyer-70% engineer) when answering. Due to the representativeness heuristic, people disregard the base rate when they hear new information even the information is useless (Tversky and Kahneman, 1974:1125; Rabin, 1998:24).

The studies about the representativeness show that people tend to overuse representativeness and neglect base rates. The inclination to disregard base rates is also defined as base rate fallacy (Rabin, 1998:25).

Adjustment and anchoring heuristic argues that people are over-reliant on the first piece of information they hear (Tversky and Kahneman, 1974:1128-1129). People were asked to predict the percentage of African countries in the United Nations. Then they were told to spin a wheel and state their answer to the question being lower or higher than the number written on the wheel. Results of the study show that people who had lower numbers on the wheel predicted lower percentages and the ones who had higher numbers on the wheel predicted higher percentages as their answers (Tversky and Kahneman, 1974:1128).

2.1.2 Cognitive Biases

People may have the wrong inferences that restrain them from being rational due to “*fast thinking*” (Kahneman, 2011: 26) during the decision making process. These inferences, which are also named as biases are difficult to eliminate. People are influenced by these biases unconsciously, perceiving their decisions made based on these inferences to be right without thinking deeply (Kahneman, 2011: 28-59). The most commonly known cognitive biases are conservatism, mental accounting including loss aversion and framing, disposition effect, bandwagon effect and overconfidence and familiarity.

Edward (1968) as cited by Barberis et al (1998) defined conservatism as the tendency to accept new information slowly. People generally misinterpret information that is contrary to their thoughts. They may disregard new information

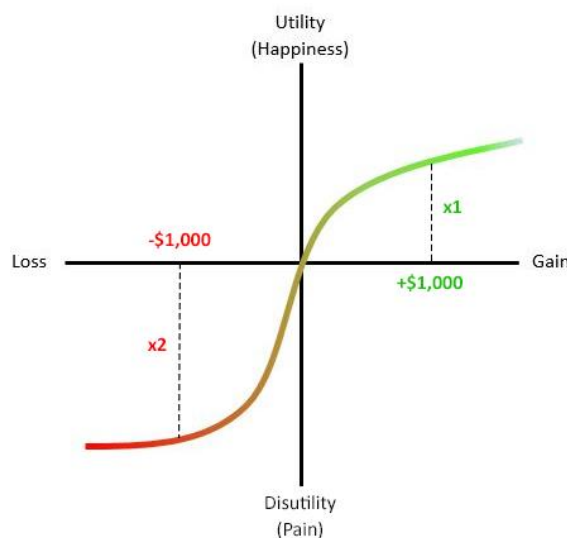
and news owing to conservatism which causes underreaction (Barberis et al, 1998:315).

According to Thaler (1999) and Barberis et al (2001:1252) mental accounting includes framing and loss aversion. In risky decisions, options include gains and losses (Barberis et al., 2001:1248). Individuals are inclined to make riskier choices when they are asked to select between a certain loss and less probable but much more amount of loss. Hence their risk taking behavior changes based on the frame.

Prospect Theory puts forth that people are not risk averse, but loss averse. It is based on the assumption that individuals assign different weights to losses and gains. As shown in Figure 4, people have the tendency to weigh losses more heavily than gains. The same unit of loss causes twice higher dissatisfaction than the satisfaction which is caused by the same unit of gain (Kahneman and Tversky, 1979: 280).

Kahneman and Tversky (1984) observed that individuals tend to choose the risky option when asked to choose between \$1000 loss with 85% probability and \$800 definite loss. This situation can be regarded that individuals are risk seeker in case of losses (Kahneman and Tversky, 1984:344). On the contrary to Traditional Finance Theories, individuals are not risk averse, they are loss averse.

Figure 4: Loss and Gain



Source: Prospect Theory, Kahneman and Tversky, 1979: 280

Due to loss aversion, investors tend to hold value losing securities on hand and they almost immediately sell value gaining securities (Shefrin and Statman, 1985:778) since realizing losses means accepting the loss. This acceptance of losses causes pain of regret. Odean (1998) investigated the behavior of investors through examination of 10,000 individual investor accounts. The findings proved that investors sell winner shares to realize the gains and hold losing shares in order to avoid realizing losses.

The bandwagon effect argues that the probability of one person adopting a belief increases based on the number of people who hold that belief. Individuals are social beings and have tendency to think and act together with others (Shiller, 1995:181).

As well as adopting similar beliefs, people tend to concentrate on their own predictions and strongly believe that their predictions will come true. The reason of high transaction volume in financial markets is based on this overconfidence (Barber and Odean, 2001:262-263). In the study of Cooper et al (1988), 2994 entrepreneurs were asked to state their chances of success in their new business compared to the chances of other entrepreneurs. Their answers show that entrepreneurs believe their own chance of success to be 70%, whereas others' chances of success to be 39%.

Familiarity bias is the situation when investors tend to choose an option that they may even have little information about over an option that they know nothing of (Baker and Nofsinger, 2002:101). For instance; French and Poterba (1991) show that over 80 % of investors in the US, Japan and the UK invest in domestic securities.

2.2 SENTIMENT

Sentiment is the unintentional feelings, opinions and views of individuals about financial markets and its instruments (Statman et al, 2008: 20). It is also described as optimism and pessimism about financial markets and returns of financial instruments (Baker and Wurgler, 2006:1649). According to Shefrin (2008:216) sentiment means optimism. Shefrin (2008:9) argues that without sentiment, price of financial instruments are efficient and describes sentiment as the

total errors of investors in the financial markets. Investor sentiment may have an effect on the financial markets when investors have pessimistic expectations about future economic conditions and they sell their existing shares causing the stock market to lose value.

In the finance literature, sentiment is measured in different ways by researchers. While sentiment surveys are direct measures of investor sentiment; closed-end funds discount rate, stock market transaction volume, first-day returns on IPOs, fund flow of mutual funds and words searched on the internet are used as proxies of investor sentiment hence are used as indirect measures.

In the US, the Michigan Index of Consumer Sentiment aims to measure investor sentiment and it is one of the most commonly used measures of sentiment. The survey is conducted by Michigan University, every month to 500 investors to gather information on their opinions and expectations about the general economy through phone calls (University of Michigan, 2018).

In Turkey, Consumer Confidence Index (Tüketici Güven Endeksi) and Real Sector Confidence Index (Reel Kesim Güven Endeksi) are used to measure investor and managerial sentiment, respectively. Consumer Confidence Index (CCI) and Real Sector Confidence Index (RSCI) are conducted by the Central Bank of the Republic of Turkey, opinions are taken through phone calls and the indices put forth the expectations of households and employees in the financial sector about general economic conditions.

Additionally, CNBC-e Confidence Index -also known as Bloomberg HT Confidence Index- is another sentiment index calculated for Turkey since 2002. CNBC-e Confidence Index calculated similar to other sentiment measures in Turkey, but the index is adapted to Turkey's conditions and is derived from the Michigan Index of Consumer Sentiment.

As a direct measurement of sentiment, Oliver (2005), Ben-David et al. (2007), Grigaliūnienė and Cibulskienė (2010), Mefteh and Oliver (2007), Azouzi and Jarboui (2012) and Tomak (2013) use variety of other consumer confidence surveys in their studies. These surveys are mainly created by the authors themselves.

Besides the surveys that are direct measurements, there are also indirect measures used by researchers to proxy for investor sentiment. Lee et al (1990:29)

argue that closed-end funds discount rate implies changing investor sentiment; high (low) discount rate means that investors have negative (positive) expectations about the future. In a similar manner, Elton et al (1998) used changes in closed-end fund discount rate as a sentiment proxy. Kandir et al (2013) analyze the relation between closed-end fund discount rate and consumer confidence index with monthly data for the years between 2005 and 2012 for Turkey. Their results put forth that there is long term relation between these two measures.

Stock market transaction volume, in other words, liquidity of the market is also used as an indirect measure of investor sentiment. Baker and Stein (2004:280) put forward that investor sentiment increases the liquidity of the market. Their results show that bullish investors tend to trade more and increase liquidity.

First day return of Initial Public Offering (IPO) is also used as a sentiment proxy in the literature (Ljungqvist et al, 2006). Generally IPO first day returns are higher than that of other days and the reason is considered to be investor sentiment (Baker and Wurgler, 2007: 138).

Mutual fund flows is suggested as a general investor sentiment proxy by Malkiel (1977). Also empirical results of Indro (2004) show a strong positive relation between mutual fund flows and investor sentiment.

Taking into consideration the increasing use of the internet among the individuals, the words searched on the internet have become another proxy of investor sentiment. The study of Da et al (2014) is one of the pioneering studies which measure sentiment with internet search results.

Baker and Wurgler (2006) created a sentiment index by combining the proxies used in previous studies to measure investor sentiment which is known as the Baker and Wurgler Index. The index includes closed-end fund discount rate, NYSE share turnover, the number and average first-day returns on IPOs, the equity share in new issues, and the dividend premium variables.

Sentiment is discussed under two headings as investor sentiment and managerial sentiment in the following parts.

2.2.2 Investor Sentiment

Investor sentiment causes deviations -known as anomalies in the financial markets. Most commonly known anomalies, over- and underreaction are predicated on psychological factors such as overconfidence and self-attribution of investors (Daniel et al, 1998:1841). Sometimes, investors underreact to the information and news about a stock which means the new information and news are reflected in prices at a lag and cause positive autocorrelations. However, overreaction means that investors are very interested in new information and news about a firm which cause overvaluation and decrease average returns in the long term (Barberis et al, 1998:308).

2.2.2.1 Underreaction

Underreaction occurs when the prices do not react to new information concurrently. That is, they react to good news in the periods following periods with good news releases and provide higher returns compared to the periods with bad news releases (Barberis et al, 1998:315). Investors may behave conservatively and anchor past information and events, thus they underreact to new information (Shefrin, 2002:58). Conservatism bias explains the reasons why investors under react to news and earnings announcements.

Ball and Brown (1968) test the effect of earnings announcements on the stock prices and find that stock prices react to earnings announcements with a delay. Cutler et al. (1991) is one of the first researchers who test underreaction hypothesis in terms of returns of stocks and bonds, foreign exchanges, gold, silver, real estate and collectible real assets of thirteen different countries for the years of 1960-1988. They find positive autocorrelation in returns for the short term (1-12 months) and their findings support the underreaction hypothesis.

Abarbanell and Bernard (1992) test the underreaction hypothesis in terms of reaction to earnings announcements providing supporting evidence to the underreaction hypothesis. They put forth that analysts underreact to new earnings. They use earnings per share and Value Line forecasts for ten years starting from

1976. The study of Bernard (1992) is another study which analyzes investors' reaction to earnings announcement yielding support to the underreaction hypothesis. Bernard (1992) quantifies the surprise which firms' earnings include by comparing forecasted and actual earnings. Empirical results of the study support earnings announcements are underreacted by market participants. Stocks with higher unexpected earnings announcements have higher returns than the stocks which have lower surprise included.

Bernard and Thomas (1990) test the underreaction hypothesis on a sample including more than 2000 US firms between the years of 1974-1986. Their results show that earnings of a firm follow a trend for the first three periods then are inclined to revert. Jagadeesh and Titman (1993) also support the underreaction hypothesis in the US. They conclude that stocks will continue to earn higher returns succeeding high return periods and continue to lose succeeding losses in the short term. Chan et al (1996), alike others, put forth that information is underreacted by market participants and reflected by the security prices with a delay.

2.3.1.2 Overreaction

Overreaction hypothesis argue that stock prices overreact to continuous modest information announcements in the long term. The stocks which have good news for a long time are inclined to be overvalued and afterwards get lower returns than post-bad news releases. Barberis et al. (1998:313) described overreaction as lower return after serial good news than the return after serial bad news. While Daniel et al (1998:1847) argue that overconfidence and self-attribution cause overreaction; according to Shleiefer (2000: 128-129) representativeness heuristic is one of the reasons of overreaction. According to Chen and Sauer (1997) investors overreact to the news that they do not expect however they do not give the same reaction to the news consistent with their expectations. Overreaction in markets enables investors to get abnormal returns by using historical data (Barberis et al., 1998:314) in contrast with weak form market efficiency.

The pioneering study on overreaction was done De Bondt and Thaler (1985) by using US data of portfolios of stocks which have extreme gains and losses in the

past five years in the period between 1933 and 1980. According to De Bondt and Thaler (1985:793), because investors disregard statistical data and concentrate on latest good (bad) information, stock prices reach inordinately high (low) levels. The empirical results, in line with the overreaction hypothesis, show that the loser portfolios, which have extreme loss, perform better than the winner portfolios, which have extreme gains.

Empirical results of Chopra et al (1992), supporting De Bondt and Thaler (1985), reveal that loser stocks in the last five years have higher returns than winners in the next five years. Howe (1986), supporting the overreaction hypothesis, use weekly US data for the years of 1963-1981.

Ülkü (2001), Durukan (2004), Barak (2008) and Doğukanlı and Ergün (2011) test the overreaction hypothesis in the Turkish market for the periods of 1989-2000, 1988-2003, 1992-2004 and 1998-2008, respectively. They all provide evidence that support the overreaction hypothesis.

2.3.1.3 Managerial Sentiment

The assumption of rationality in the financial markets involves corporate managers as well as investors. There are many studies that prove managers alike investors are also affected by sentiment (Malmendier and Tate (2005, 2008); Ben-David et al. (2013); Bockhay and Dimitrov, 2014). Managerial sentiment generally is considered as managerial optimism and/or overconfidence and in many researches the terms managerial optimism and/or overconfidence are used interchangeable with managerial sentiment (Malmendier and Tate, 2005; Oliver, 2005; Hackbarth, 2008; Chen and Lin, 2012).

Nofsinger (2005: 144) and Hackbarth (2008:845) state that investor sentiment has an effect on the mood of corporate managers which influence their decisions. In the event of existence of optimistic ambiance caused by optimistic investors' expectations and beliefs, corporate managers have the tendency to exaggerate their abilities and consider the risks as unimportant. Hsiao et al (2011) put forth that managerial sentiment induce over- or underinvestment. Their results show that

managers invest more (less) when they have optimistic (pessimistic) expectations and beliefs about the general economy.

However, there are very few studies to examine the relation between managerial sentiment and capital structure decisions. Hackbarth (2008: 847), Malmendier and Tate (2005: 2671) and Nofsinger (2005:145) argue that corporate managers are inclined to use more debt financing during the optimistic ambience which causes managerial overconfidence.

2.3 LITERATURE ON SENTIMENT RESEARCH

Finance researchers have recently started to examine the relation between psychological factors of financial markets participants and stock returns and financing decisions of firms in detail. In this part of the study, studies which examine the relationship between investor sentiment and stock returns, investor sentiment and firm financing decisions, manager confidence and optimism will be discussed.

2.4.1 Sentiment and Stock Returns

Lee et al. (1991), which is the pioneering study about investor sentiment, evaluates the relation between investor sentiment and stock returns. Closed-end fund discount rate is used as a proxy for investor sentiment. According to their results sentiment is found to be highly correlated with the stock returns of small companies whereas it is not correlated with large companies' stock returns.

Fisher and Statman (2000) find a negative relationship between investor sentiment and future stock returns in their study which examines the relation between S&P 500 returns and Merrill Lynch data as a proxy for sentiment between the years of 1987 and 1998.

Brown and Cliff (2004) investigate the relation between investor sentiment and short term stock returns. They focus on market aggregates and the empirical tests were applied on both weekly and monthly data. They use different proxies for investor sentiment. As a direct measurement of sentiment, they use the survey done by the American Association of Individual Investors as the proxy for individual

investor sentiment and Investors Intelligence analysis which consist of expert expectations gathered from various newsletters as the proxy for institutional sentiment. Indirect measurement of sentiment based on market activities consists of market performance, types of trading activity and derivatives trading activity. In addition to these direct and indirect measures, closed end fund discount, net purchases of mutual funds, proportion of fund assets held in cash, initial public offering first day returns and the number of offerings are used as proxies of sentiment (Brown and Cliff, 2004).

According to the empirical results of Brown and Cliff (2004), indirect measurements of sentiment are related with each other and with the direct proxies. In addition, sentiment and markets are in compliance. Higher optimism causes increase in current prices and decrease in sequential returns. These results affirm that speculators are influenced by the most recent market performance. However, sentiment has little forecasting ability for future stock returns. The only significant relation is found between institutional sentiment and sequential large stocks returns. The relation is negative but has no explanatory power according to R square tests (Brown and Cliff, 2004: 15).

Baker and Wurgler (2006) investigate how stock returns are affected by investor sentiment. They create an index known as the Baker and Wurgler Index by using sentiment proxies which are used in previous studies. According to their empirical results, stock returns, especially difficult to value stocks namely younger, small, unprofitable, non-dividend paying, highly volatile, extreme growth and distressed stocks are strongly affected by the sentiment. While after high levels of investor sentiment periods, low return periods come; low levels of sentiment periods are followed by high return periods (Baker and Wurgler, 2006: 1663).

Baker and Wurgler (2007) aim to determine how investor sentiment is measured empirically, what kind of stocks are more reactive to investor sentiment - more-speculative or bond-like stocks and whether investor sentiment is a predictor of stock returns. They used the Baker and Wurgler (2006) Index to empirically measure investor sentiment. According to their empirical results, speculative, that is hard to arbitrage, stocks are more sensitive to investor sentiment than bond-like stocks (Baker and Wurgler, 2007: 146). In terms of return predictability, their results show

that if the sentiment is high, the succeeding stock returns will be low and vice versa (Baker and Wurgler, 2007: 147).

Grigaliūnienė and Cibulskienė (2010) investigate the relation between investor sentiment and stock returns on the Scandinavian Stock Markets for the years between 1989 and 2009. They use the consumer confidence index and economic sentiment indicator as proxies for investor sentiment. They find a negative relationship between stock returns and investor sentiment. On the other hand, their empirical results become statistically insignificant when macroeconomic variables are included in the model. The results support the view that sentiment does not have an effect on stock returns (Grigaliūnienė and Cibulskienė, 2010: 938).

Baker et al. (2012) evaluate sentiment at the global and the local levels for six countries, namely Canada, France, Germany, Japan, the UK, and the US. They create indices for global sentiment and local sentiment levels for each country for the years of 1980 to 2005. The indices consist of volatility, number of initial public offerings in a year, first-day returns of initial public offerings and turnover variables. Statistically significant results of the study show that both global and local sentiment at the start of the period is negatively related with forthcoming stock returns (Baker et al., 2012: 286).

Canbaş and Kandır (2007) examine the effect of investor sentiment on the stock returns in Turkey. They use closed-end fund discount, average fund flow of mutual funds and the ratio of net stock purchases of foreign investors to Borsa Istanbul market capitalization as proxies for sentiment. According to the results of the study, investor sentiment can forecast the returns movement directions and level.

Olgaç and Temizel (2008) evaluate the relationship between investor sentiment and BIST 30 Index. They used the data between the years of 2004 and 2007 and measure investor sentiment with Consumer Confidence Index. Their empirical findings put forward that BIST 30 Index has an effect on the investor sentiment. The positive change in return of BIST 30 causes the increase in Consumer Confidence Index. That is investors become optimistic about the financial markets when the return of BIST 30 increases.

Bolaman and Mandacı (2014) investigate the relationship between investor sentiment and BIST100 index with regard to the economic crisis effects. They use

consumer confidence index as a proxy for investor sentiment and analyze the data between the years of 2003 and 2012. Empirical findings of the study put forth that there is a long-term relationship between investor sentiment and BIST100 returns.

Can Ergün and Durukan (2017) attempt to evaluate the relation between BIST and investor sentiment in the course of economic crisis. In this regard they analyze the BIST 100 index returns and sentiment by using closed-end fund discount rate as the proxy for investor sentiment for the periods between January 1997 and April 2017. Their findings put forth that when investors are getting more pessimistic, BIST 100 index return is decreasing during the whole period and during national crisis.

2.4.2 Sentiment and Firm Financing Decisions

The literature on firm financing decisions and its relationship with managerial or investor sentiment is limited. Many studies focus on managerial overconfidence and financing decisions. In this regard, managerial overconfidence is stated as the same concept with sentiment. However, the focus of the present study is managerial sentiment –thoughts, expectations and perceptions regarding the market not the personal beliefs of managers of themselves.

Malmendier and Tate (2005) investigate the relation between managerial overconfidence and corporate financing decisions. They use two proxies for managerial overconfidence. First proxy is the portfolios of managers which is a signal of their expectations and beliefs of their own firms and the financial markets. Second proxy is related with how the CEOs are perceived by financial journalists or analysts; this data is taken from financial newsletters. According to Malmendier and Tate (2005: 2691) overconfident managers overrate volatility, financial distress and they are inclined to use higher debt leading to an increased possibility of financial distress and bankruptcy.

Oliver (2005) examines the effects of managerial confidence on capital structure decisions for the US for the years of 1978 to 2004. He uses University of Michigan Consumer Sentiment Index as a proxy for managerial confidence level. Empirical results present a significant positive relation between managerial overconfidence and debt level of US firms (Oliver, 2005: 16).

Barros and Silveria (2007) analyze the capital structure decisions of Brazilian firms which are listed on the Sao Paulo Stock Exchange for the years of 1998 to 2003 with regards to characteristics of managers who are responsible for financing decisions. They classify managers as entrepreneur and non-entrepreneur in order to evaluate managers' confidence levels. When a manager is owner of the firm at the same time he/she is denominated as entrepreneur, meaning the manager is overconfident; a hired manager is called as non-entrepreneur, meaning that he/she is rational or less overconfident. According to their results, there is a positive and statistically significant relation between leverage and overconfident manager proxy. If a firm is managed by an overconfident manager, the firm has higher debt levels than a firm managed by a less overconfident manager (Barros and Silvia, 2007: 21).

Ben-David et al. (2007) analyze the effect of managerial overconfidence on financing decisions. They hypothesize that overconfident managers think that their firms' shares are underrated in the financial markets and overconfident managers are prone to use more debt. They measure the overconfidence of managers with a survey carried out by Duke University between 2001 and 2007 which includes eight questions about the U.S. economy, firm policies, and firm short-term forecasts. The survey was applied to hundreds of top financial executives and 6901 observations were acquired. Their results provide with a positive relation between overconfidence of managers and debt level of firms (Ben-David et al., 2007: 29).

Malmendier et al. (2007) claim that overconfidence level of managers is related with higher debt levels. To investigate their argument, they measure the overconfidence level by using the recent option exercise of managers and evaluate the personal portfolio of managers to understand the managers' expectations considering the amount of their own firm stock in their portfolios. Their results show that overconfident managers are prone to use higher debt than other managers. They state that overconfidence level of managers influence their financing decisions (Malmendier et al., 2007: 26).

Hackbarth (2008) hypothesize that overconfident managers are inclined to use higher debt that is they underrate the financial distress and tend to get additional debt. The results confirm his hypothesis and put forth that managers' characteristics have an effect on firms' capital structure decisions (Hackbarth, 2008: 875-876).

Fairchild (2009) creates a model to evaluate the effect of overconfident managers on financing decisions and firm value. Their first proposition argues that overconfident managers exaggerate their abilities and underrate the financial distress costs and it leads to increased debt levels. Empirical results of the study which support this proposition find positive relation between overconfidence level and firms' debt level (Fairchild, 2009: 22). The second proposition suggests that overconfident managers use less debt to increase free cash flows not to miss any investment opportunity. Empirical results related with the second proposition indicate a negative relationship between overconfidence and debt level which is contradictory to the existing literature (Fairchild, 2009: 20). However, in terms of managerial overconfidence effects on firm value, for both propositions, this study provides inconclusive evidence (Fairchild, 2009: 22).

Mefteh and Oliver (2010) are the first ones to explicitly investigate the effect of sentiment as a determinant of capital structure of the listed firms in France. They set a cross-sectional time-series model which considers sentiment as a capital structure determinant besides size, industry median leverage, and dividend, market to book ratio, tangibility and profitability variables. They use two proxies for sentiment; one of them is used to measure investor confidence and the other one is related with managerial sentiment. The sentiment related data was acquired from Economic and Financial Affairs Department of the European Commission surveys. The firm related data was taken from Compustat database for the years of 1995 to 2004.

Unlike the studies that use US firms as a sample, empirical results of this study put forth that industry sentiment, combination of investor and managerial sentiment, is negatively related with leverage (Mefteh and Oliver, 2010: 20). However, when sentiment is separately evaluated as investor sentiment and managerial sentiment; the results provide evidence that managerial sentiment and leverage of the firms are positively related. The investor sentiment on the other hand has a negative relationship. Due to the dominance of investor sentiment, overall industry sentiment has been found as negatively related with leverage. This situation is considered as a result of existence of intense block holder control in French markets by the authors (Mefteh and Oliver, 2010: 18).

Azouzi and Jarboui (2012) examine capital structure determinants including managerial optimism. Based on their survey among 100 Chief Executive Officers who work in Tunisian firms, they determine whether the managers are optimistic or not. Their results, in accordance with their positive relation expectation between tendency of using external financing and optimism of managers, put forth that managers who are optimistic tend to use more external financing including debt than less optimistic managers (Azouzi and Jarboui, 2012: 67-68).

Alimov and Mikkelsen (2012) evaluate the motivations of going public of firms for US sample between the years of 1979 and 2007 by using the initial public offering of common stock data. According to their results, the firms which are analyzed, go public during the high investor sentiment periods.

Tomak (2013) examines the effect of overconfidence on capital structure for 115 manufacturing Turkish firms for the years of 2002 to 2011. She uses the consumer confidence index provided by CNBC-e for Turkish firms, which is adopted from the Michigan University Consumer Confidence Index. She sets up a model to analyze determinants of capital structure; in addition to size, industry median leverage, market to book ratio, tangibility, profitability, expected inflation and GDP, management confidence variable is added to model. Although management overconfidence is expected to increase debt level, the study does not provide conclusive results about the relation between management overconfidence and financing decisions (Tomak, 2013:516-517).

CHAPTER 3

EMPIRICAL ANALYSIS

This chapter embodies the aim of the study, theoretical framework, research design and empirical results of the study.

3.1 AIM OF THE STUDY

The factors which affect capital structure decisions are examined in two groups; as firm specific factors and macroeconomic factors. Firm specific factors are used in order to analyze the effect of firms' specifications on leverage. On the other hand, macroeconomic factors are put in the model to observe the effect of general economic environment on leverage. In addition to these factors, investor and managerial sentiment are analyzed to investigate whether they influence capital structure decisions or not.

The aim of the study is to evaluate the effects of both managerial and investor sentiment on capital structure decisions (leverage) of the firms listed on Borsa Istanbul for the period 2010 to 2017. It has been recognized that there is a gap in the literature in terms of the studies that evaluate the relation between both investor and managerial sentiment and capital structure; hence this thesis aims to contribute to the literature by analyzing this relationship for Turkish listed firms for the period between 2010 and 2017.

3.2 HYPOTHESIS DEVELOPMENT

As stated in Chapter 2, to our best knowledge there is just one study which examines the effects of both investor and managerial sentiment on capital structure. Mefteh and Oliver (2010) empirically test investor sentiment and capital structure relation for French sample and their empirical results show the relation between investor sentiment and debt level of firms is negative. Their results, however demonstrate a positive relationship with managerial sentiment and leverage.

In this regard main focus of researchers is the relation between investor sentiment and stock returns. There are studies covering the relation between investor sentiment and IPO decisions and returns. Based on Market Timing Theory, managers or owners tend to make IPO decisions when they think their firm is overvalued and investors have positive aspects about the market. For instance Alimov and Mikkelsen (2012:537) state that firms go public when investors are optimistic. Moreover, first day returns of IPO is also used as investor sentiment proxy in the literature. Empirical results of Cornelli et al. (2006) and Derrien (2005) show that higher investor sentiment yields higher IPO returns.

Higher managerial sentiment implies that managers have optimistic expectations about the market and they expect that the market will go up and their firms will be overpriced. Hence, as stated by Baker and Wurgler (2002), managers want to take advantage of the favorable market conditions and they are inclined to use equity financing instead of debt financing. Hence the following hypotheses are formulated.

H₁₁: There is a negative relationship between investor sentiment and total leverage.

H₁₂: There is a negative relationship between investor sentiment and long-term leverage.

H₁₃: There is a negative relationship between investor sentiment and short-term leverage.

H₂₁: There is a negative relationship between managerial sentiment and total leverage.

H₂₂: There is a negative relationship between managerial sentiment and long-term leverage.

H₂₃: There is a negative relationship between managerial sentiment and short-term leverage.

3.3 SAMPLE AND DATA

In this thesis 169 nonfinancial firms listed on Borsa İstanbul have been analyzed. Financial firms and the firms which have interrupted data were deleted from the sample. The firm specific data is collected from quarterly financial statements for the years between 2010 and 2017, and retrieved from Finnet Database. The analysis is limited to the period from 2010 to 2017 to eliminate the economic crisis effect on CCI and RSCI and was ended with the latest available data, the fourth quarter of 2017.

Macroeconomic variables and investor sentiment related quarterly data were downloaded from the website of the Turkish Statistical Institute for the years between 2010 and 2017. Managerial sentiment related data was downloaded from data base (Electronic Data Delivery System-EVDS) of the Central Bank of Turkish Republic.

3.4 MODEL SPECIFICATION

Based on the theoretical framework developed in Chapters 1 and 2, the variables shown in Figure 5 are tested empirically by the existing study. That is the dependent variable, leverage, is considered as total leverage, short term leverage and long term leverage to investigate if the relationship of the independent variables with different measures of leverage differ. The following models are developed to test the relationship between sentiment and leverage based on the theoretical framework.

In light of the theoretical framework, the following models are developed:

Model 1:

$$TLEV_{i,t} = a_0 + a_1CCI_{i,t} + a_2MB_{i,t} + a_3SIZE_{i,t} + a_4TANG_{i,t} + a_5PRF_{i,t} + a_6TAX_{i,t} + a_7INF_{i,t} + \varepsilon_{it}$$

Model 2:

$$LTLEV_{i,t} = a_0 + a_1CCI_{i,t} + a_2MB_{i,t} + a_3SIZE_{i,t} + a_4TANG_{i,t} + a_5PRF_{i,t} + a_6TAX_{i,t} + a_7INF_{i,t} + \varepsilon_{it}$$

Model 3:

$$STLEV_{i,t} = a_0 + a_1 CCI_{i,t} + a_2 MB_{i,t} + a_3 SIZE_{i,t} + a_4 TANG_{i,t} + a_5 PRF_{i,t} + a_6 TAX_{i,t} + a_7 INF_{i,t} + \varepsilon_{it}$$

Model 4:

$$TLEV_{i,t} = a_0 + a_1 RSCI_{i,t} + a_2 MB_{i,t} + a_3 SIZE_{i,t} + a_4 TANG_{i,t} + a_5 PRF_{i,t} + a_6 TAX_{i,t} + a_7 INF_{i,t} + \varepsilon_{it}$$

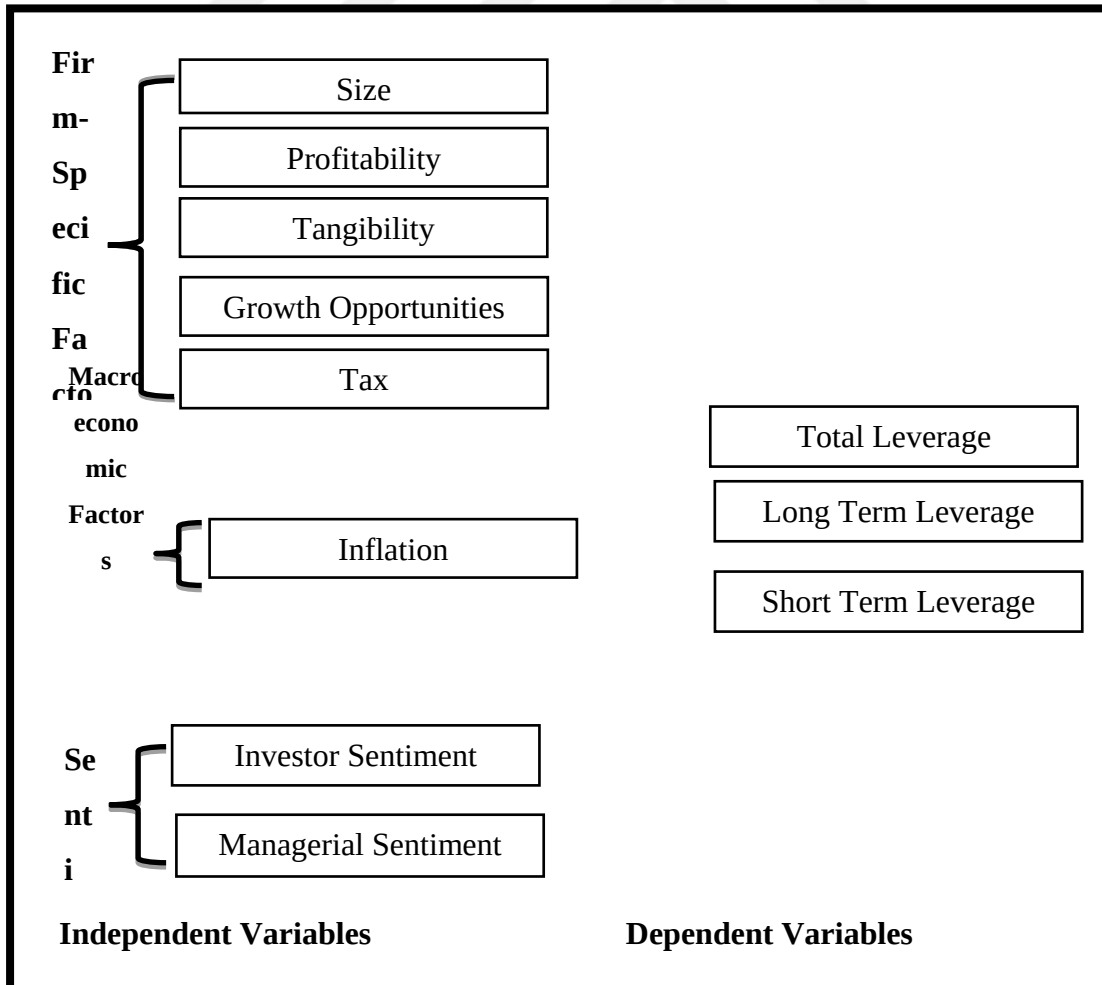
Model 5:

$$LTLEV_{i,t} = a_0 + a_1 RSCI_{i,t} + a_2 MB_{i,t} + a_3 SIZE_{i,t} + a_4 TANG_{i,t} + a_5 PRF_{i,t} + a_6 TAX_{i,t} + a_7 INF_{i,t} + \varepsilon_{it}$$

Model 6:

$$STLEV_{i,t} = a_0 + a_1 RSCI_{i,t} + a_2 MB_{i,t} + a_3 SIZE_{i,t} + a_4 TANG_{i,t} + a_5 PRF_{i,t} + a_6 TAX_{i,t} + a_7 INF_{i,t} + \varepsilon_{it}$$

Figure 5: Theoretical Framework



The definitions of the variables used in the above models are presented at Table 2. In the models the subscript *i* denotes firm *i*, and subscript *t* denotes time.

Table 2: Definition of Variables

Variable Name	Definition
Dependent Variables:	
TLEV _{<i>i,t</i>} (<i>Total Leverage</i>)	Total Debt / Total Assets
LTLEV (<i>Long Term Leverage</i>)	Long Term Debt / Total Assets
STLEV (<i>Short Term Leverage</i>)	Short Term Debt / Total Assets
Independent Variables:	
SIZE (<i>Size</i>)	Natural Logarithm of TL value of sales of each firm at the end of the year
PRF (<i>Profitability</i>)	EBITDA/ Total Assets
TANG (<i>Tangibility</i>)	Plant Property Equipment / Total Assets
TAX (<i>Tax</i>)	Tax Paid / EBT
MB (<i>Growth Opportunities</i>)	Market value of the firm /Book value of the firm
INF (<i>Inflation</i>)	Change in Consumer Price Index (CPI) (realized in Turkey)
CCI (<i>Investor Sentiment</i>)	Change in Consumer Confidence Index (measured by Central Bank of Turkish Republic)
RSCI(<i>Managerial Sentiment</i>)	Change in Managerial Confidence Index (measured by Central Bank of Turkish Republic)

As firm specific variables, size, profitability, tangibility, growth opportunities and tax shield are included in the analysis. Sentiment is added to the model as an independent variable following Oliver (2005), Mefteh and Oliver (2010) and Tomak (2013). Investor sentiment and managerial sentiment are taken into consideration

separately in the models. As a control variable, inflation rate is also added to the model.

3.4.1 Dependent Variables

As shown at Table 2, three types of leverage definition are employed. As stated by Rajan and Zingales (1995) and Hovakimian et al. (2004) total leverage is defined as Total Debt / Total Assets.

Following Hall et al (2004), Gajurel (2006), Frank and Goyal (2009), Mokhova and Zinecker (2014) long term leverage is measured by Long Term Debt / Total Assets.

Alike Dağlı (1998), Hall et al (2004), Gajurel (2006) and Mokhova and Zinecker (2014) short term leverage is measured by Short Term Debt / Total Assets.

3.4.2 Independent Variables

Based on the literature discussed in Chapter 1, in this study, as firm-specific factors size, profitability, tangibility of assets, tax paid by firms and growth opportunities; as macroeconomic factors inflation and GDP are accounted in the regression equation and sentiment is added to the model to determine to test its relationship with capital structure decisions.

The studies that test the variables as determinants of capital structure and proxies used in these studies are provided in Appendix 1.

Size (SIZE): Following Tomak (2013), natural logarithm of sales is used as a proxy for firm size.

Profitability (PRF): Following Rajan and Zingales (1995), Oliver (2005) and Mefteh and Oliver (2010), EBITDA / Total Assets ratio is used as a proxy for profitability.

Tangibility (TANG): Following Rajan and Zingales (1995), Wiwattanakantang (1999), Oliver (2005), Frank and Goyal (2009) and Tomak (2013) Tangible Assets / Total Assets is used as proxy for tangibility.

Growth Opportunities (MB):Alike Rajan and Zingales (1995), Huang and Song (2002), Oliver (2005), Frank and Goyal (2009) and Tomak (2013)Market to Book ratio is used as growth opportunities proxy.

Tax (TAX):Following Durukan (1997) and Demirhan (2009) Tax paid / EBT is used as a proxy for tax.

Inflation (INF):Following Gajurel (2006), Qurat ul ain et al (2011), and Köksal and Orman (2015), change inCPI change is used as the inflation proxy.

3.4.2.1 Investor Sentiment

In this study, Consumer Confidence Index (CCI) -measured by Central Bank of Turkish Republic and Turkish Statistical Institute is used as a proxy for investor sentiment. CCI is calculated according to participants' answers to the questions related with their current opinions and expectations about general economic conditions and their personal financial conditions.

The data source of CCI is Consumer Tendency Survey (CTS) which is applied monthly in Turkey. Aim of the CTS is to evaluate the personal financial conditions and get their opinions about current conditions and expectations about general economy and tendencies of spending and savings.

Personal financial situation covers the participant's financial situation for the past 12 months, expectation of the financial situation of his/her family during the next 12 months, financial situation evaluation for the household, possibility of borrowing in the next 3 months period(Central Bank of the Republic of Turkey, 2018).

The part on the overall economy involves the assessment of the general economic situation and beliefs on the change of the consumer prices in the last 12 months period; opinions about the appropriateness of the purchase of durable goods and savings in the current period; and expectations concerning the general economic situation, the forecast of unemployment number and expectation of changes in the consumer prices and the wages in the next 12 months period in Turkey(Central Bank of the Republic of Turkey, 2018).

Spending and savings tendency cover the consideration of the expenditures on semi-durables in the next 3 months; probability of buying a car, considerations of the expenditure on consumer durables, and the possibility of buying or construction of houses or spending money on housing repairs and the probability of saving over the next 12 months.

CCI value is between 0 and 200. The case of index being higher than 100 is regarded as consumers being optimistic; while the case when the index is lower than 100, consumers are regarded as pessimistic (Central Bank of the Republic of Turkey, 2018). The change in the index value is included in the analysis.

3.4.2.2 Managerial Sentiment

Real Sector Confidence Index (RSCI)-measured by Central Bank of Turkish Republic and Turkish Statistical Institute is used as a proxy for managerial sentiment.

Data source of RSCI is Business Tendency Survey (BTS) which is applied every month and supposed to produce indicators to reflect the short-term trends of the manufacturing industry by inquiring from senior managers who are leading the economy in the manufacturing industry, their recent past evaluations, their views on the current situation and their future expectations. The questionnaire consists of 28 questions in January, April, July and October and 22 questions in the other months(Central Bank of the Republic of Turkey, 2018).

RSCI is an indicator that aims to show the impressions of real sector representatives about the general situation of the Turkish economy calculated by compiling the answers of the BTS. The questions regarding the calculation of RSCI is related with total volume of sales orders, inventory of finished goods, exports, production, employment and fixed capital investment expenditures. The indices of the various questions asked are determined by adding 100 to the total balance values(Central Bank of the Republic of Turkey, 2018).

The RSCI is then computed by taking the arithmetic average of these sub-indices. While choosing the appropriate questions, economic significance and the performance for leading the industry production index, low volatility and cross correlations are taken into account. No base-year adjustment for the index is made.

RSCI value is between 0 and 200. The case of the index being higher than 100 is regarded as managers being optimistic; while the case of the index being lower than 100, managers are regarded as pessimistic (Central Bank of the Republic of Turkey, 2018). The change in the index value is included in the analysis.

3.5 EMPIRICAL FINDINGS

In accordance with the aim of this study in evaluating the relationship between firm specific variables and sentiment, and leverage variables, General Least Squares regression analysis has been employed to test the hypotheses. Inflation rate as control variable is included in the models.

Table 3 provides the descriptive statistics of the variables used in the analysis. As can be seen, the minimum change in the CCI is -0.065 and the maximum value is 0.150. Mean of the change in CCI is 0.002 for the years between 2010 and 2017. Standard deviation of the change in CCI is 0.047. The minimum value of the change in RSCI is 0.005; its maximum value is 0.080. Standard deviation of the change in RSCI is 0.026. As the descriptive statistics present the change in the investor sentiment, the change in CCI, has higher standard deviation but lower mean value compared to the change in managerial sentiment, change in RSCI.

Table 3: Descriptive Statistics

Variable	Min	Max	Mean	Std.
SIZE	8.383	24.711	18.915	2.150
PRF	-0.430	1.242	0.059	0.070
TANG	0.001	0.985	0.481	0.219
MB	0.000	171.398	2.401	5.136
TAX	-2345.025	151.318	-0.358	32.396
INF	-0.003	0.054	0.021	0.013
CCI	-0.065	0.150	0.002	0.047
RSCI	-0.043	0.080	0.005	0.026

Table 4 presents the correlation between the independent variables used in the regression analysis. There is no high correlation between the variables which causes multicollinearity. There is a positive relationship between CCI and RSCI (0.577);

however since these two variables are used in the models separately, this does not create any multicollinearity problems.

Table 4: Correlation Matrix

	SIZE	PRF	TANG	MB	TAX	INF	CCI	RSCI
SIZE	1.000							
PRF	0.388	1.000						
TANG	-0.112	-0.111	1.000					
MB	0.019	0.062	-0.019	1.000				
TAX	0.030	0.010	0.016	-0.003	1.000			
INF	-0.005	0.011	0.013	-0.017	-0.021	1.000		
CCI	-0.042	-0.045	0.011	0.011	-0.008	-0.010	1.000	
RSCI	-0.010	0.002	0.021	0.008	-0.040	0.178	0.577	1.000

To carry out the panel data analysis, first the Hausman test is done to decide whether the random effects model or the fixed effects model should be used in the analysis. As exhibited at Table 5, Hausman test results show that the Random-Effects model is appropriate hence the null hypothesis for all six models cannot be rejected. As a result, all models were estimated using Generalized Least Squares (GLS) random effects.

Table 5: Hausman Test Results

Panel A. CCI		
Model 1	Model 2	Model 3
0.483	0.587	0.188
Panel B. RSCI		
Model 4	Model 5	Model 6
0.465	0.567	0.180

Note: The numbers in the table are the p -values of Hausman (1978) χ^2 test.



The outcome of the regression analysis is presented in Table 6 and Table 7.

Table 6: Random GLS regression Results for Consumer Confidence

Independent/Dependent	Total Debt (Model 1)	Long-Term Debt (Model 2)	Short-Term Debt (Model 3)
Ω	-0.433 ^a (0.004)	-0.369 ^a (0.000)	-0.028 (0.801)
SIZE	0.0485 ^a (0.000)	0.022 ^a (0.000)	0.024 ^a (0.000)
PRF	-0.8242 ^a (0.001)	-0.227 ^a (0.000)	-0.584 ^a (0.002)
TANG	0.149 (0.169)	0.218 ^a (0.000)	-0.084 (0.333)
MB	0.003 ^c (0.062)	0.000 (0.560)	0.003 ^c (0.064)
TAX	0.000 ^b (0.012)	1.85e-06 (0.644)	0.000 ^a (0.010)
INF	0.346 ^a (0.003)	0.254 ^a (0.000)	0.093 (0.349)
CCI	-0.083 ^a (0.010)	-0.330 (0.275)	-0.051 (0.301)
σ_u	0.431	0.123	0.345
σ_e	0.201	0.102	0.237
P	0.820	0.593	0.678
$p - (\chi^2)$	0.000 ^a	0.000 ^a	0.000 ^a
R^2 - within	0.055	0.051	0.019
R^2 - between	0.003	0.160	0.016
R^2 - overall	0.008	0.120	0.017
$p - BP$	0.000	0.000	0.000

Note: a, b, and c indicates statistical significance at 1%, 5% and 10% level, respectively. The GLS regression specification is: $Leverage_{it} = \omega + \beta X_{it} + u_i + \varepsilon_{it}$. Where ω is the intercept term. P is the interclass correlation and is calculated by dividing σ_u^2 by sum of σ_u and σ_e . (where σ_u and σ_e are standard deviation of residuals within groups (u_i) and standard deviation of overall error term (ε_{it})). $p - (\chi^2)$ is the p -value of the test statistic for the null hypothesis that all coefficients in the model are zero. R^2 - within, R^2 - between, and R^2 - overall are the coefficients of determination for within the groups, between the groups, and overall, respectively. $p - BP$ is the p -value of the Breusch and Pagan (1980) Lagrange multiplier (LM) test for the null hypothesis that variances across groups are zero. It also shows that random effects model is appropriate. Numbers in parentheses are p -values.

According to the χ^2 test values of the six models, all models are statistically significant at 1% level. As shown in Table 6, CCI has been found significantly negatively related with only Total Leverage at 1% level as stated in H₁₁. That is the hypothesis has been accepted. It has a negative sign in the other models; however the relation is statistically insignificant contrary to hypothesis H₁₂ and H₁₃.

Four of the firm specific determinants (SIZE, PRF, MB and TAX) and macroeconomic determinant (INF) have statistically significant relationship with Total Leverage. SIZE, MB and TAX have a positive related with Total Leverage; PRF has a negative relationship with Total Leverage. The negative relation of profitability with Total Leverage supports the Pecking Order Theory. INF has positive relation with Total Leverage. TANG has positive sign, but the relation is not statistically insignificant.

Three firm-specific and one macroeconomic factor have the statistically significant relationship with Long-Term Debt / Total Assets ratio as shown in Table 6. SIZE, TANG and INF have a positive relation with long-term leverage, PRF has a negative relationship with long term debt to total assets ratio. Although MB and TAX have positive signs, these variables are statistically insignificant. Also, between CCI and long-term leverage, no statistically significant relationship is found.

Short-Term Debt / Total Assets ratio has no statistically significant relationship with INF; four firm-specific factors are found to be statistically significantly related with this ratio. While SIZE, MB and TAX have a positive relationship with short term leverage, PRF has a negative relation. On the other hand, TANG and CCI have a negative but insignificant; INF has positive but insignificant relationship with short term leverage.

As shown in Table 6 and Table 7, PRF has a negative relation with all dependent variables as argued by the Pecking Order Theory and the related literature. These relations are statistically significant at 1% level for all models.

The independent variable TANG has only been found statistically significantly related with long-term leverage and it has a positive sign. MB which represents growth opportunities of the firm has statistically significant relationship with short-term and total leverage.

Table 7: Random GLS regression Results for Real Sector Confidence

Independent/Dependent	Total Debt (Model 4)	Long-Term Debt (Model 5)	Short-Term Debt (Model 6)
ω	-0.442 ^b (0.003)	-0.372 ^a (0.000)	-0.335 (0.765)
SIZE	0.0488 ^a (0.000)	0.224 ^a (0.000)	0.249 ^a (0.000)
PRF	-0.821 ^a (0.001)	-0.226 ^a (0.000)	-0.582 ^a (0.002)
TANG	0.152 (0.162)	0.219 ^a (0.000)	-0.081 (0.354)
MB	0.003 ^c (0.062)	0.000 (0.564)	0.003 ^c (0.064)
TAX	0.000 ^c (0.057)	1.08e-06 (0.820)	0.000 ^c (0.055)
INF	0.440 ^a (0.000)	0.269 ^a (0.000)	0.172 ^b (0.036)
RSCI	-0.260 ^a (0.008)	-0.366 (0.674)	-0.222 (0.186)
σ_u	0.431	0.123	0.345
σ_e	0.201	0.102	0.237
P	0.820	0.592	0.678
$p - (\chi^2)$	0.000 ^a	0.000 ^a	0.000 ^a
R^2 - within	0.056	0.051	0.020
R^2 - between	0.003	0.160	0.015
R^2 - overall	0.008	0.120	0.016
$p - BP$	0.000	0.000	0.000

Note: a, b, and c indicates statistical significance at 1%, 5% and 10% level, respectively. The GLS regression specification is: $Leverage_{it} = \omega + \beta X_{it} + u_i + \varepsilon_{it}$. Where ω is the intercept term. p is the interclass correlation and is calculated by dividing σ_u^2 by sum of σ_u and σ_e . (where σ_u and σ_e are standard deviation of residuals within groups (u_i) and standard deviation of overall error term (ε_{it})). $p - (\chi^2)$ is the p -value of the test statistic for the null hypothesis that all coefficients in the model are zero. R^2 - within, R^2 - between, and R^2 - overall are the coefficients of determination for within the groups, between the groups, and overall, respectively. $p - BP$ is the p -value of the Breusch and Pagan (1980) Lagrange multiplier (LM) test for the null hypothesis that variances across groups are zero. It also shows that random effects model is appropriate. Numbers in parentheses are p -values.

The all models which are analyzed in this thesis are statistically significant at 1% level as shown in Table 6 and 7.

RSCI has a statistically significant negative relationship with only total leverage at 1% level as hypothesized by H₂₁. Even though the variable has a negative sign, the relationships between RSCI and short-term and long-term leverage have been found statistically insignificant.

As shown in Table 7, four firm specific determinants (SIZE, PRF, MB and TAX) and one macroeconomic determinant (INF) have statistically significant relationship with Total Leverage. SIZE, MB, TAX and INF have a positive effect on Total Leverage. There is a negative relation between PRF and Total Leverage consistent with the Pecking Order Theory.

SIZE, PRF and TANG have significant relation with long-term leverage as firm specific determinants. While SIZE and TANG have positive relation with the dependent variable; PRF has a negative relation. In addition to firm specific determinants, INF -as a macroeconomic determinant- has a positive relation with Long-Term Debt/ Total Assets. MB and TAX have positive but statistically insignificant relations with long-term leverage.

There is a positive relation between Short-Term Debt / Total Assets ratio and SIZE, MB, TAX and INF. However, negative relationship has been found between PROF and short-term leverage. In addition, negative relationship has been found between TANG and short-term leverage, whereas the relation is not statistically significant.

In sum, sentiment measured as investor sentiment or managerial as a determinant of capital structure is found statistically significant in model 1 and model 4 only. In all models the sign of the sentiment variable is negative. The managerial sentiment has a higher coefficient compared to investor sentiment in all models. This evidence proves that there is a negative relationship between sentiment and total leverage which implies that as sentiment goes up the leverage level of the firms go down. The distinction between investor sentiment and managerial sentiment does not make a difference in terms of the relationship. However, supporting evidence has not been found for short term or long term leverage.

CONCLUSION

As Behavioral Finance argues people are influenced by their psychological states and biases in their decision making process. Hence, finance researchers have to take into account these behavioral issues in addition to the Traditional Finance Theories' assumptions. Since managers as individuals are also prone to these biases, the decisions about the firms are also affected by these people's psychological states and biases. This study attempts to evaluate the effects of investor and managerial sentiment on the capital structure decision as well as the firm specific and macroeconomic factors stated in the literature. Sentiment is divided into two categories as investor and managerial sentiment. Investor sentiment which measures the optimism or pessimism of investors about the market is added to the model. Managerial sentiment which includes the expectations and perceptions of the senior managers regarding the market is accounted for in the model. While a change in CCI is used as investor sentiment proxy; a change in RSCI is used as the managerial sentiment proxy.

In the literature, there are limited number of studies that examine the relationship between firms' capital structure decisions and sentiment. To the best of our knowledge there is no study which examines the relation among both investor and managerial sentiment and capital structure for Turkey. In this regard, this study attempts to contribute to the literature by analyzing both investor and managerial sentiment effects on capital structure for Turkish firms.

The analysis included 169 nonfinancial firms that were traded on Borsa Istanbul between 2010 and 2017 using quarterly data utilizing GLS regression analysis. According to the empirical findings, there are statistically negative relationships between investor sentiment and total leverage; and managerial sentiment and total leverage of the firms at 1% level.

Consistent with the Trade-off Theory and the literature presented in Appendix 1 firm, size has been found positively related with dependent variables -leverage for all six models statistically significant at 1% level. On the other hand, as argued by the Pecking Order Theory, profitability has a negative sign in all six models and is found statistically significant. As argued by both Trade-off Theory and Pecking Order

Theory and has been found by Mandacı (2009) and Okuyan and Taşçı (2010) for Turkish firms, the variable tangibility is only statistically significantly related with the long term leverage.

According to the regression analysis, managerial sentiment and investor sentiment both have negative signs implying that the higher the optimism about the market, lower the debt level. These findings may be explained by the Market Timing Theory. Based on the theory, equity financing is preferred by firms when they are overvalued on the market (Baker and Wurgler, 2002: 1). Hence, it can be argued that optimism of the investors and managers regarding the market conditions makes the companies prefer equity financing leading to lower leverage ratios.

This thesis supports the claim of Behavioral Finance that people are affected by their psychological situations and perceptions during decision making processes. In this regard, being optimistic or pessimistic about the market conditions is beyond people's power. Having expectations, thoughts and perceptions in the matter of market conditions are a spontaneous matter. Managers, while making decisions about capital structure, have to evaluate the market conditions. RSCI consists of the thoughts, expectations and perceptions of the senior managers. If the RSCI value is high, managers have optimistic expectations and perceptions about the market conditions. It might refer that managers expect the market will go up. Thus, managers tend to use equity financing rather than debt financing in order to take advantage of favorable market conditions. Nonetheless, when managers are pessimistic about the market conditions they are willing to use debt financing to make use of the advantages of debt. Since, they do not want their firms stock to trade in the adverse market conditions. Therefore, it can be said that managers have to comprehend the economic and market conditions in depth so as not to miss the opportunity to take advantage of debt by using excessive equity financing.

Also high investor sentiment which represents individuals' expectations and perceptions regarding economic situation is negatively related with total debt level. As stated at Table 4, there is a high positive correlation between investor and managerial sentiment; because of that the relations between leverage and both investor and managerial sentiment is expected to be same direction. Additionally, Model 1 which analyzed the relation between total debt and investor sentiment and

Model 4 which is analyzing total debt and managerial sentiment relation have almost the same R^2 values. 0,055 and 0,056 are R^2 values of the Model 1 and Model 4, respectively. Both models, found to be statistically significant, have almost the same explanatory power according to the R^2 values. However the coefficient of RSCI (-0,260) is higher than the CCI's coefficient (-0,083). That is, RSCI has three times higher effect on total leverage than CCI.

Despite both investor and managerial sentiment have statistically significant relationships with total leverage; the variables have insignificant relationships with long-term and short-term leverage measures. It can be interpreted as both investor and managerial sentiment having no effect on the maturity of debt; the variables are only related with the amount of total debt. This argument requires further analysis which is out of the scope of this thesis

Firms listed on BIST -stock exchange of a developing country- have been analyzed in this thesis. Although empirical results are proper for Turkish sample, the empirical findings cannot be generalized because of country characteristics. Additionally, the effects of economic crisis on the sentiment variables are disregarded in this thesis which can be analyzed under future studies. Similar studies can be done on a more generalized sample for wider time intervals which covers economic crisis periods. Moreover, different sentiment measures can be use in further studies.

As a limitation, the median industry leverage could not be accounted in the models as used by Mefteh and Oliver (2010) because of lack of data.

For further research, it can be suggested that Principal Component Analysis (PCA) can be benefitted to turn firm-specific determinants into one variable for minimizing the variables in the regression analysis. Moreover, following Mefteh and Oliver (2010) an industry sentiment variable can be created and tested.

Instead of taking the change in the CCI and RSCI, these could be converted into dummy variables for optimism and pessimism. When Consumer Confidence Index and Real Sector Confidence Index values are higher than 100, they show optimism regarding the market; when they are lower than 100, they show pessimism regarding the market. Hence, the variables can be accounted in the regression analysis as dummy variables.

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APPENDICES



Firm Size	Friend and Lang 1988	+	NYSE Firms	1979-1983	Logarithm of total assets
	Titman and Wessels 1988	-	US data	1974 - 1982	Natural Logarithm of sales Quit Rate
	Rajan and Zingales 1995	+ (Except Germany)	Non-financial corporations of the G-7 countries	1984-1991	Market value of their assets
	Chen et al. 1999	+	Listed Dutch firms	1984 - 1995	Logarithm of sales
	Wiwattanakitang 1999	+	listed non-financial firms on Securities Exchange of Thailand	1996	Logarithm of its sales
	Colombo 2001	+	Hungarian firms	1992-1996	a) Logarithm of net sales b) Level of employment
	Fama and French 2002	+	Nonfinancial US firms	1965-1999	Natural log of total book assets
	Drobnitz and Fix 2003	+	Swiss data		Natural log of net sales
	Frank and Goyal 2003	-	Publicly traded American firms	1971-1998	Logarithm of total assets
	Bauer 2004	+	Listed 74 companies in the Czech Republic	2000-2001	Natural logarithm of sales (Natural logarithm of total assets)
	Chen 2004	(Negative relation long term) large firms use more short-term finance and less long-term finance	Chinese public-listed companies	1995-2000	Log of total assets
	Huang and Song 2006	+	Chinese-listed companies	1994-2003	Natural logarithm of sales
	Frank ve Goyal 2009	+	Publicly traded American firms	1950-2003	Log of assets Mature
	Hanousek and Shamshur 2011	+	Eastern European countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia)	1996-2006	Logarithm of total assets
	Durukan 1997	+	Turkish listed firms	1990-1995	Average total assets
	Dağlı 1998	Total and long-term debt + Short term debt -	Turkish listed firms	1991-1996	Total Assets
	Sayilgan et al 2006	+	Turkish listed firms	1993-2002	Natural logarithm of sales
	Demirhan 2009	+	Turkish listed firms	2003-2006	a) Natural logarithm of equity b) Natural logarithm of total assets c) Natural logarithm of sales
	Mandacı 2009	-	Turkish listed firms	1996-2004	Natural Logarithm of Net Sales
	Terim and Kayalı 2009	+	Turkish listed manufacturing firms	2000-2007	Total Assets
	Ata and Ağ 2010	+	Turkish listed firms	2003-2007	Log net sales
	Okuyan and Taşçı 2010	+	Turkish listed firms	2001q2-2008q2	Natural logarithm of total assets
	Sayilgan and Uysal 2011	+	Turkish listed firms	1996-2008	Natural logarithm of sales Natural logarithm of total assets
	Acaravcı 2014	-	Turkish listed firms	1993-2010	Natural log. of total assets
	Köksal and Orman 2015	+	Survey-based Sectoral Balance Sheets (SBS) dataset of the CBRT	1996-2009	Natural logarithm of total net sales
	Akay and Efsun 2015	+	Turkish listed firms	2008-2014	Log of Sales Log of Total Assets
	İrk and Karaca 2015	Insignificant	Turkish listed firms	2000-2010	Natural Logarithm of Total Assets
	Burucu and Öndes 2016	-	Turkish listed firms	1990-2014	Logarithm of total assets
	Güner 2016	-	Turkish listed firms	2008-2014	Natural log of sales

Profitability	Myers and Majluf 1984	-		NYSE Firms	1979-1983	EBIT / Total Assets
	Friend and Lang 1988	-				
	Rajan and Zingales, 1995	-		Non-financial corporations of the G-7 countries	1984-1991	EBITDA / Book Value of Assets
	Chen et al. 1999	-		Listed Dutch firms	1984 - 1995	Operating Income / Total Asset
	Wiwattanakitang 1999	-		Listed non-financial firms on Securities Exchange of Thailand	1996	ROA
	Booth et al. 2001	-		10 developing countries	1980-1990	ROA
	Hovakimian et al 2001	-		US firms	1979-1997	ROA
	Özkan 2001	-		UK firms	1984-1996	EBITD / Total Assets
	Bevan and Danbolt 2002	-		UK firms	1991-1997	EBITDA / Total Assets
	Fama and French 2002	-		Nonfinancial US firms	1965-1999	EBIT / Total Assets
	Drobetz and Fix 2003	-		Swiss data	1996-2001	ROA Operating Income / Sales
	Bauer 2004	-		Listed 74 companies in the Czech Republic	2000-2001	Return on Assets (EBIT / Total Assets)
	Chen 2004	-		Chinese public-listed companies	1995-2000	EBITDA / Total Assets
	Hall et al 2004	Negative relation with short term (UK, Italy, Germany and Belgium)		Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal and the UK	1995	ratio of pre-tax profits to sales turnover
	Huang and Song, 2006	-		Chinese-listed companies	1994-2003	EBIT / Total Assets
	Frank and Goyal 2009	-		Publicly traded American firms	1950-2003	Profit (operating income before depreciation)
	Chen and Chen 2011	-		305 Taiwan electronic companies which are quoted on the Taiwan Stock Exchange	2009	ROE
	Malinić et al 2013	-		Serbian non-financial firms listed on the regulated market	2008-2011	ROE
	Durukan 1997	-		Turkish listed firms	1990-1995	a) Average Net Income / Average Sales b) Average Net Income/ Average Total Assets
	Dağlı 1998	Negative with long term Insignificant for total debt and short term debt		Turkish listed firms	1991-1996	EBIT / Total Assets
	Demirhan 2009	-		Turkish listed firms	2003-2006	a) Net Profit/Total Assets b) Operating Profit/Sales c) Operating Profit/Total Assets
	Mandacı 2009	-		Turkish listed firms	1996-2004	EBIT
	Terim and Kayalı 2009	Negative Positive for 2003-2004		Turkish listed manufacturing firms	2000-2007	Net income / Average Sales
	Burucu and Öndeş 2016	-		Turkish listed firms	1990-2014	Net profit/ Total Assets (Assets profitability)
	Köksal and Orman 2015	-		Turkish listed firms	1996-2009	Operating Income / Total Assets
	Acaravcı 2015	-		Turkish listed firms	1993-2010	Net Income / Total Assets
	Yakar 2011	-		Turkish listed firms	2000-2009	Net Income / Total Assets
	Sayılgan and Uysal 2011	+		TCMB sector Balance Sheet	1996-2008	Net Profit/ Total Assets (Assets profitability) Operating Profit / Net Sales (Sales profitability)
	Abdiloğlu and Deniz 2015	-		Turkish listed firms	2009-2013	EBIT / Total Assets
	Akay and Efsun 2015	-		Turkish listed firms	2008-2014	EBT/Total Assets
	Güner 2016	-		Turkish listed firms	2008-2014	EBITD / Total Assets
	Çağlayan 2006	-		Turkish listed firms	N/A	N/A
	Sayılgan et al 2006	-		Turkish listed firms	1993-2002	EBITD / Total Assets
	Diğerçök 2017	-		Turkish listed firms	2000-2007	EBITDA / Total Assets

Firm-specific Factors

Tangibility of Assets	Friend and Lang 1988	+	NYSE Firms	1979-1983	Fixed Assets / Book Value of Total Assets
	Rajan and Zingales 1995	+	Non-financial corporations of the G-7 countries	1984-1991	Fixed Assets / Book Value of Total Assets
	Chen, Lensink and Sterken 1999	-	Listed Dutch firms	1984 - 1995	Tangible Asset / Total Assets (fixed assets and inventories as tangible assets)
	Wiwattanakitang 1999	+	Listed non-financial firms on Securities Exchange of Thailand	1996	net value of property, plant and equipment divided by total assets
	Booth et al., 2001	-	10 developing countries: India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea	1980-1990	(Total Assets - Current Assets) / Total Assets
	Colombo 2001	+	Hungarian firms	1992-1996	Fixed assets / Total Assets
	Bevan and Danbolt 2002	Negative for short term debt Positive for long term debt	UK firms	1991-1997	Fixed assets / Total Assets
	Drobetz and Fik 2003	+	Swiss data	1996-2001	Fixed assets / Total Assets
	Bauer 2004	-	Listed 74 companies in the Czech Republic	2000-2001	Tangible Assets / Total Assets
	Chen 2004	+	Chinese public-listed companies	1995-2000	Fixed asset + Inventory / Total Assets
	Hall et al 2004	+ long term	Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal and the UK	1995	Fixed assets / Total Assets
	Huang and Song 2006	+	Chinese-listed companies	1994-2003	Fixed Assets scaled by Total Assets
	Frank and Goyal 2009	+	Publicly traded American firms	1950-2003	Plant Property Equipment / Total Assets
	Chen and Chen 2011	+	305 Taiwan electronic companies which are quoted on the Taiwan Stock Exchange	2009	Fixed assets / Total Assets
	Malinić et al 2013	-	Serbian non-financial firms listed on the regulated market	2008-2011	Fixed assets / Total Assets
	Cornelli et al 1998	-	Hungary and Poland	N/A	N/A
	Dağlı 1998	+	Turkish listed firms	1991-1996	(Tangible Assets+ Inventories) / Total Assets using book values
	Sayilgan et al 2006	-	Turkish listed firms	1993-2002	(Tangible Assets+ Inventories) / Total Assets using book values
	Demirhan 2009	-	Turkish listed firms	2003-2006	Fixed Assets / Total Assets
	Mandacı 2009	Negative for short term and total debt Positive for long term debt	Turkish listed firms	1996-2004	Net Fixed Assets / Total Assets
	Terim and Kayalı 2009	-	Turkish listed manufacturing firms	2000-2007	Net Fixed Assets / Total Assets
	Okuyan and Taşçı 2010	Negative for short term and total debt Positive for long term debt	Turkish listed firms	2001q2-2008q2	Net Fixed Assets / Total Assets
	Sayilgan and Uysal 2011	+	TCMB sector Balance Sheet	1996-2008	Net Fixed Assets / Total Assets
	Abdioğlu and Deniz 2015	-	Turkish listed firms	2009-2013	Net Fixed Assets / Total Assets
	Acaravcı 2015	-	Turkish listed firms	1993-2010	Net Fixed Assets / Total Assets
	Akay and Efsun 2015	+	Turkish listed firms	2008-2014	Fixed Assets / Total Assets
	İrk and Karaca 2015	-	Turkish listed firms	2000-2010	Tangible Fixed Assets / Total Assets
	Burucu and Öndeş 2016	-	Turkish listed firms	1990-2014	Tangible Fixed Assets/ Change in total assets %

Growth	Myers 1977	-			
	Rajan Zingales 1995	-	Non-financial corporations of the G-7 countries	1984-1991	Market to Book
	Chen et al. 1999	Insignificant	Listed Dutch firms	1984 - 1995	Percentage change of sales year over year
	Özkan 2001	-	UK firms	1984-1996	Market to Book Ratio of Total Assets
	Bevan and Danbolt 2002	+	UK firms	1991-1997	Market to Book Ratio (The ratio of the book value of total assets less the book value of equity plus the market value of equity, to the book value of total assets)
	Drobetz and Fix 2003	High M/B ratio Lower leverage	Swiss data	1996-2001	Ratio of book-to-market equity
	Bauer 2004	-	Listed 74 companies in the Czech Republic	2000-2001	market-to-book ratio
	Chen 2004	+	Chinese public-listed companies	1995-2000	Sales growth/total asset growth
	Hall et al 2004	+(significant for Spain)	Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal and the UK	1995	percentage change in sales turnover in the previous three years
	Barclay and Smith 2005	-	US firms	1950-2003	Market to Book
	Huang and Song 2006	-	Chinese-listed companies	1994-2003	Market to Book Ratio of Total Assets
	Frank and Goyal 2009	-	Publicly traded American firms	1950-2003	1) Market-to-book ratio 2) Change in log assets 3) Capital-expenditure-to assets ratio
	Chen and Chen 2011	+	305 Taiwan electronic companies which are quoted on the Taiwan Stock Exchange	2009	Percentage change of net revenue
	Malinić et al 2013	+	Belgrad Stock Exchange	2008-2011	Percentage change of net sales
	Durukan 1997	+	Turkish listed firms	1990-1995	Average percentage change in Total Assets
	Sayilgan et al 2006	2 different relation for 2 different proxy	Turkish listed firms	1993-2002	Increase in plant, property and equipment
	Demirhan 2009	Insignificant	Turkish listed firms	2003-2006	R & D Expenses / Sales
	Mandacı 2009	+	Turkish listed firms	1996-2004	Market to Book Value of Total Assets
	Okuyan and Taşçı 2010	-	Turkish listed firms	2001q2-2008q2	Change in total assets
	Ata and Ağ 2010	-	Turkish listed firms	2003-2007	% Change in sales
	Sayilgan and Uysal 2011	+	TCMB sector Balance Sheet		Change in total assets %
	Köksal and Orman 2015	Insignificant	Survey-based Sectoral Balance Sheets (SBS) dataset of the CBRT	1996-2009	% Change in sales
	Acaravcı 2015	+	Turkish listed firms	1993-2010	Market to Book
	Abdioğlu and Deniz 2015	Insignificant	Turkish listed firms	2009-2013	Change in total assets
	Akay and Efsun 2015	-	Turkish listed firms	2008-2014	Change in total assets %
	İrk and Karaca 2015	+	Turkish listed firms	2000-2010	Change in total assets %
	Burucu and Öndeş 2016	-	Turkish listed firms	1990-2014	Change in total assets %
	Güner 2016	-	Turkish listed firms	2008-2014	Change in sales / change in assets
	Dinçergök 2017	-	Turkish listed firms	2000-2007	Market to Book Ratio

Non-debt tax shield	DeAngelo and Masulis 1980	-	N/A	N/A	N/A
	Bowen et al 1982	-	US data	1951-1969	N/A
	Bradley et al 1984	+	US firms	1962-1981	Annual Depreciation + Investment Tax Credits / EBITDA
	Titman and Wessels 1988	-	US data	1974 - 1982	Depreciation / Total assets Investment tax credit / total assets
	Demirgüç and Maksimović 1994	-	Ten Developing Countries (Brazil, India, Jordan, the Republic of Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey, Zimbabwe)	1980-1991	Depreciation to total assets
	Wiwattanakitang 1999	-	Listed non-financial firms on Securities Exchange of Thailand	1996	Depreciation to total assets
	Miguel and Pindado 2001	-	Non-financial quoted Spanish companies	1990-1997	Earnings before Taxes minus the ratio between the taxes paid and the tax rate
	Özkan 2001	-	UK firms	1984-1996	Annual depreciation expense to total assets
	Fama and French 2002	-	Nonfinancial US firms	1965-1999	Depreciation / Total Assets
	Drobnitz and Fix 2003	Insignificant	Swiss data	1996-2001	Depreciation / Total Assets Depreciation/Operating Profit
	Bauer 2004	-	Listed 74 companies in the Czech Republic	2000-2001	Depreciation / Total Assets
	Chen 2004	+	Chinese public-listed companies	1995-2000	Depreciation to total assets
	Huang and Song 2006	-	Chinese-listed companies	1994-2003	Depreciation and amortization scaled by total assets
	Durukan 1997	-	Turkish listed firms	1990-1995	Average depreciation / Average total assets
	Dağlı 1998	-	Turkish listed firms	1991-1996	Average depreciation / Average total assets
	Sayilgan et al 2006	-	Turkish listed firms	1993-2002	Annual depreciation expense to total assets
	Demirhan 2009	Insignificant	Turkish listed firms	2003-2006	Depreciation Expenses / Total Assets
	Terim and Kayali 2009	Negative (Except 2002-2003)	Turkish listed manufacturing firms	2000-2007	Fixed Assets / Total Assets
	Sayilgan and Uysal 2011	-	Turkish firms	1996-2008	Depreciation Expenses / Total Assets
	Abdöglu and Deniz 2015	Insignificant	Turkish firms	2009-2013	Depreciation Expenses / Total Assets
	Irak and Karaca 2015	+	Turkish listed firms	2000-2010	Depreciation Expenses / Total Assets
	Güner 2016	Insignificant	Turkish listed firms	2008-2014	Depreciation Expenses / Total Assets
Tax	Michaelas et al. 1999	Insignificant	Small and medium sized enterprises in the UK	1986-1995	Effective tax rate
	Bancel and Mittoo 2004	Insignificant	16 European countries Austria, Belgium, Denmark, Greece, Finland, Ireland, Italy, France, Germany, Netherlands, Norway, Portugal, Spain Switzerland, Sweden, and the UK	2001	Corporate tax rate
	Bauer 2004	Insignificant	Listed 74 companies in the Czech Republic	2000-2001	The difference between earnings before taxes and earnings after taxes
	Huang and Song 2006	-	Chinese-listed companies	1994-2003	Average tax rate
	Mokhova and Zinecker 2013	+	Czech Republic, Slovakia, Poland, Hungary, France, Germany and Greece	2006-2011	Income taxes as percentage of revenue
	Durukan 1997	+	Turkish listed firms	1990-1995	Tax paid / EBT
	Demirhan 2009	Insignificant	Turkish listed firms	2003-2006	Tax Paid / EBT
	Irak and Karaca 2015	Insignificant	Turkish listed firms	2000-2010	Tax Paid / EBT

Macro-economic Factors

Variable	Article	Relation with Debt Level	Sample	Period	Proxy
Inflation	Joeveer 2006	+	Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia	1995-2002	Inflation rate
	Gajurel 2006	Negative with short-term and total debt Positive with long-term debt	Nepalese firms	1995-2004	Annual percentage change in CPI
	Bokpin 2009	+(Short term debt)	34 emerging market countries		Inflation rate
	Frank and Goyal 2009	+	Publicly traded American firms	1950-2003	Expected inflation rate which is the expected change in the consumer price index over the coming year using data from the Livingston Survey
	Hanousek and Shamshur 2011	+	The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia	1996-2006	Expected inflation
	Qurat-ul-ain et al. 2011	Negative relation long term debt Positive relation short term debt	Pakistani firms	2003-2009	Annual percentage change in CPI
	Mokhova and Zinecker 2013	Negative for the Czech Republic Positive for France	Czech Republic, Slovakia, Poland, Hungary, France, Germany and Greece	2006-2010	Inflation rate
	Khanna et al 2015	+	Indian firms	1992-2013	WPI (Indian Index)
	Durukan 1997	Insignificant	Turkish listed firms	1975-1997	CPI
	Köksal and Orman 2015	+	Survey-based Sectoral Balance Sheets (SBS) dataset of the CBRT	1996-2009	Percent change in CPI
GDP	Booth et al. 2001	Negative relation total debt and short-term debt Positive relation long-term debt	10 developing countries	1980-1990	Inflation rate
	Joeveer 2006	+	Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia	1995-2002	GDP growth rate
	Gajurel 2006	Negative relation total debt and short-term debt Positive relation long-term debt	Nepalese firms	1995-2004	Gross domestic product at factor cost
	Bokpin 2009	-	34 emerging market countries	1990 - 2006	GDP per capita
	Hanousek and Shamshur 2011	+	The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia	1996-2006	page 16, GDP is proxy for Growth opportunities ???
	Köksal and Orman 2015	-	Survey-based Sectoral Balance Sheets (SBS) dataset of the CBRT	1996-2009	Percent change in real GDP
Development of Financial Markets	Demirgüç and Maksimović 1994	-	Brazil, India, Jordan, Republic of Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey, and Zimbabwe	1980-1991	market capitalization to Gross Domestic Product, MCAP/GDP
	Giannetti 2003	Issuing equity is substitute for long-term debt	Belgium, France, Ireland, Italy, the Netherlands, Portugal, Spain and the U.K	1993-1997	stock market capitalization to GDP and of bond market capitalization to GDP
	Gajurel 2006	+	Nepalese firms	1995-2004	Market capitalization to gross domestic product
	Joeveer 2006	-	Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia	1995-2002	The ratio of stock market capitalization to GDP
	Bokpin 2009	Insignificant	34 emerging market countries	1990 - 2006	Size of the market is used as a proxy for capital market access
	Köksal and Orman 2015	-	Turkish non-financial firms	1996-2009	size of capital flows