SERMAYE YAPISINA ETKI EDEN FAKTÖRLER: BİST 'TE AMPIRIK BIR ÇALIŞMA FACTORS[1]

FACTORS EFFECTIVE ON CAPITAL STRUCTURE: AN EMPIRICAL ANALYSIS OF LISTED FIRM IN BIST

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Özet

Bu araştırmada sermaye yapısına etki eden faktörler incelenmiştir. Bu amaçla Türkiye'de hisse senetleri BİST-100'de işlem gören 60 firmanın 2000-2012 yılları arasındaki verileri incelenmiştir. Analizler varlık değerlerine göre küçük ve büyük olarak gruplanan firmalar için ayrı ayrı yapılmıştır. Sermaye yapısına etki eden faktörler birden fazla değişkenle ölçüldüğü için bu değişkenlerden en önemlilerini ortaya çıkarmak amacıyla değişkenlerin analize tek tek dahil edildiği ileri-doğru seçme (forward selection) yöntemi kullanılmıştır. Sermaye yapısına etki eden faktörler genel olarak varlık yapısı, kârlılık, büyüme olanakları, firma riski ve borç dışı vergi kalkanı olurken, büyük ve küçük firmaların toplam ve uzun vadeli borçlanmalarına etki eden faktörler arasında dikkate değer bazı farklar tespit edilmiştir.

Anahtar Kelimeler: *Sermaye yapısı, Kaldıraç oranı, Firma Büyüklüğü, Kârlılık, Risk*

Jel: G30, G32

Abstract

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This research examines the factors that affect capital structure. For this purpose, the data of 60 firms listed on BİST-100 in Turkey between 2000 and 2012 have been analyzed. Analyses have been made separately for the firms grouped according to their asset values as big or small. Since the factors affecting capital structure are measured with more than one variable, so as detect most important factors, the forward selection method is used in which the variables are included one by one. While the factors effective on capital structure are asset structure, profitability, growth opportunities, the risk of the firm, non-debt tax shield; on the other hand considerable differences have been noticed between the factors affecting big and small firms' total and long-term debts.

***Key Words:** Capital Structure, Leverage Rate, Firm Size, Profitability, Risk*

Jell: G30, G32

INTRODUCTION

The composition of capital structure is one of the fundamental debate topics in the finance industry. In these discussions since the 50s, it has been argued that the firms' debt or equity preferences are made through internal factors as well as macroeconomic factors. This study analyses the firms' sizes, financial liabilities, and financial ratios together with macroeconomic factors such as economic growth, stock market's share in the economy and inflation. The findings related to the capital structure of the firms are provided an opportunity to obtain new findings through the firms in Turkey while they are influenced by the differences amongst economic development levels, industry-specific differences and size differences. In this study, the analysis of the capital structure is identified by the multiple regressions made on the variables providing reasonable results after the statistical analyses on effective items of firms' many variables. In the studies of the Literature, predominantly, the capital structure analyses through firms' internal variable and financial ratios are common. The unique part of this study is that macroeconomic factors and firm-specific factors are stating a drastic opening on capital structure theories. In the study, capital structure analyses' theoretical frameworks are declared in historic order. Obtained findings are analysed according to

the findings in the international literature, after the capital structure, analyses in literature are assessed and their methods are explained.

1. THEORETICAL FRAMEWORK

In the finance literature, one of the early theoretical approaches that analyse the relationship between capital structure and market value of the firms is Modigliani and Miller's (1958) irrelevancy theory. According to this approach, the valuation of a firm is irrelevant to the capital structure of a company. According to this approach, it is not possible to increase a firm's value simply by increasing or decreasing its debts in its capital structure. After the criticisms, Modigliani and Miller (1963) made an adjustment on the irrelevancy approach by accepting the fact that since debt appears as a liability in financial statements, debt reduction in corporate income taxes provides an advantage for the benefit of debts in the process of capital structure decision-making. This advantage emerged by debt reduction in taxes is called tax shield proposal in the finance literature.

Modigliani and Miller's (1963) adjustment on debts' proposition of tax shield is heavily criticized because of the fact that it reminds the possibility of reaching the maximum value levels by structuring the capital structures only with debts. Some of the researchers, who are opposite to the idea of firm values are increased proportionally to the debt amounts, drew attention to the danger on firms' cash flows aftermath of increased possibility of bankruptcy by expenses arising from over-usage of leverage. (Baxter, 1967; Stiglitz, 1972; Kraus and Litzenberger, 1973). According to these researchers, assuming all other variables are fixed, how high the implicit bankruptcy costs and/or bankruptcy possibility of firms' cash flows, the cost of borrowing would increase that much and the firm value would decrease.

Farrar and Selwyn (1967), Myers (1977) and Miller (1977) brought income tax purposes up for discussion by asserting the claim that the tax leverage consequence from the reduction of interests in corporate income tax could disappear with the personal taxes extracted from the interest and dividend payments to stakeholders. According to them, how high the tax payments received from the interest and dividend payments to stakeholders, the leverage achieved from structuring the

capital structure with debts would be that low. By this reason, there is a negative correlation between the tax paid on the interest income and the firms' leverage levels.

Jensen and Meckling (1976) opened agency costs up for discussion in addition to bankruptcy costs asserted against debts' tax leverage. According to Jensen and Meckling (1976), if the lenders are worried the firms would use the financing derived from debts in high-risk bearing or non-profitable investments, they would lend with interests. Debts' agency costs are consisting of high interest consequence from such a concern. In this situation, as the agency costs of debts increase, the debt ratio used in capital structure would decrease.

Another approach against the tax shield of debt is non-debt tax shield. According to this approach, like the interests, depreciation excluding the debts and investment incentives could also be reduced from the tax base. Tax leverage comprised through this way is called nondebt tax shield. According to this approach handled systematically for the first time by De Angelo and Masulis (1980), as the nondebt tax shield increase, debt would decrease.

Bankruptcy costs and other approaches developed against the proposition of tax shield of debts are reminded that in real life, markets are not functioning as assumed and none the less, an optimum capital structure could be achieved with a focus on both tax and bankruptcy cost.

Hirshleifer (1966) is stated that the optimum capital structure is on the equilibrium point somewhere between '' *present value of the tax reduction allowance and the present value of the marginal cost of leverage ''.* Kraus and Litzenberger (1973), with a similar statement, told that the optimal capital structure is on the equilibrium point where the maximum firm value is achieved with minimum cost (cost of capital). Later on, this approach is divided into two parts as static balancing approach based on firms' current debt ratios as equilibrium point and dynamic balancing approach claiming firms have scattered debt ratios rather than static debt ratios.

Myers (1984) and Majluf (1984) put forward the approach of pecking order by claiming that firms' investment decisions are reflecting the choice between internal or external financing rather than a search for an optimum balance between debt and equity. According to this approach, investors

value stocks below their real value because of the asymmetric information between firm managers and investors. In this case, firms would choose internal financing over external financing for their financing needs. If a firm has to make a decision between retained earnings and debt, it would choose retained earnings. If a firm has to lean to external financing, it would choose debt over stocks. Issuance of the stocks is the least preferable way of financing after the retained earnings and the debt alternatives. By this reason, this theory is called pecking order.

2. ANALYSIS OF FACTORS EFFECTIVE ON CAPITAL STRUCTURE

In this section, applications used in the analysis of factors effective on capital structure are included. Datasets, statistical models, analysis methods and findings as consequent of these methods explained, respectively.

2.1. Data:

In this study in which factors are effective on the capital structures of the firms, the annual data of 60 firms whose stocks traded in Istanbul Stock Exchange's BIST-100 index between the years of 2000 and 2012 obtained as of 2013 December (N=780). Subjected firms choose from the manufacturing industry. 40 firms whose stocks traded in BIST-100 index could not be included in this study because of the fact that some of them were banks, insurance companies and financial leasing companies whose financial statements different from the ones in production industry, others were sports clubs whose financial calendars also functioning differently and lastly the ones in production industry whose data is not available. Data of the firms between the years of 2000 and 2009 were obtained with a request to Istanbul Stock Exchange. The rest of the data (data of the firms between the years of 2009 and 2012) is extracted from the website of Public Disclosure Platform (a.k.a KAP). After the raw data extracted from relevant parties, they were processed in order to transform them to the variables would be used in the analysis (Table-1). Calculations relevant to macroeconomic variables such as Inflation and Gross Domestic Product (GDP) were

obtained from the World Bank's World Development Indicators database. (World Bank, 2013). Data analysed by using the SPSS 17.0 software.

2.2 Variables:

Capital Structure Variables (Dependent Variables):

Capital structure variables are related to the debt and equity balance of the firms. Most of the time expressed as leverage ratios. It could be calculated as total debt over total assets as well as debt over net worth. In this study, four different leverage ratios are used (Table-1).

Macroeconomic Factors:

Macroeconomic factors or a country's economic position is related to macroeconomic variables such as efficiency of money and capital markets, development level of the country (developed, developing, underdeveloped), total value of the stock market, total debt rates of the firms, gross domestic product, and inflation levels. These ratios calculated as annually and same for each firm. (Table-1)

Firm-specific Factors:

These factors have been debated since the emergence of the modern capital structure approaches. These factors could be classified as profitability, capital structure, size, growth opportunities, financial risk, and non-debt tax shield, tax rate and uniqueness of the product produced (Table-1).

Tablo-1 Research variables

Variable subclass	Symbol	Definitions of Variables
Macroeconomic Factors	INF	Annual Average Inflation Rate
	GDP	Annual Average Gross Domestic Product Ratio
	STOCK	The Rate of Annual Average Stock Market Value / GDP
	LL	The Rate of Annual Average Liquid Liabilities / GDP
Profitability	P1	Interest and Profit Before Tax / Total Assets
	P2	(Interest and Profit Before Tax + Depreciation) / Total Assets
	P3	Operating Income / Total Assets
	P4	Operating Income / Sales
	P5	Net Profit / Total Assets
	P6	Net Profit / Total Equity
Asset Structure	AS1	Long-term Assets / Total Assets
	AS2	Net Tangible Fixed Assets / Total Assets
	AS3	(Tangible Assets + Inventories) / Total Assets
	AS4	(Long-term Assets + Inventories) / Total Assets
	AS5	Machinery, Plant and Equipment / Total Assets
	AS6	Intangible Fixed Assets / Total Assets
Size	SİZE1	Log of Asset

	SİZE2	Log of Sales
Growth Opportunities	GO1	Change in log Asset
	GO2	Change in log Sales
	GO3	Change in Total Assets
Non-debt tax shield	NDTS1	Depreciation / Total Assets
	NDTS2	Depreciation / EBİTDA
	NDTS3	Non-debt tax shield / Total Asset (Titman &Wessels, 1988)
Tax	TAX	Paid Tax / Earnings Before Tax
Risk	RİSK1	Standard Deviation of Change in Operating Income
	RİSK2	Standard Deviation of Asset Returns
	RİSK3	Standard Deviation of the Difference of a Previous Year EBITDA / Average Total Assets
Uniqueness	UNIQUE1	Research and Development / Sales (RD/S)
	UNIQUE2	Selling Expenses / Sales

2.3 Statistical Model:

Least squares model is used in this study. This model is developed in order to put forward the factors effective on capital structure. Since the factors effective on capital structure are measured more than one variable, in order to detect most important factors, forward selection method in which the variables are included one by one is used. One of these models, TD, is formulized in below-stated way;

$$TD = \propto\ + \beta 1 Profitability\ (Model\ 1) +\ \beta 2 Growth\ Opportunities\ (Model\ 2)$$
$$+ \beta 3 NDTS\ (Model\ 3) + \beta 4\ Tax\ Rate (Model\ 4)$$
$$+ \beta 5\ Asset\ Structure\ (Model\ 5) + \beta 6\ Inflation\ (Model\ 6)$$
$$+ \beta 7 GDP (Model\ 7) + \beta 8\ Liquid\ Liabilities\ (Model\ 8)$$
$$+ \beta 9 Stock\ Growth\ Rate\ (Model\ 9)$$

As it can be clearly seen from the formula, in the forward selection method, the model is starting with a constant value and a new model is starting to function as each variable included in the model. If the newly included variable is lack of providing a reasonable contribution, it is automatically excluded from the model. This continues until the very last meaningful new variable included in the model. This method is used in Frank and Goyal (2009)'s similar study in which factors effective on capital structure have researched through 36 factors, before.

2.3.1. TD Model (Total Debt/Assets Model):

Table-2 contains statistics on the latest models emerged through *forward-selection* multiple regression analysis. When the statistical meanings of *F* values examined, it can be seen that both models are able to explain changes in the total debt ratio in a statistically meaningful way. For the firms in the first group, latest emerged model is the fifth one. It can be seen that this model consisting of five variables, is able to explain 32 % of the variance in the total debt rates of the firms in the first group. In this model, the variables are ranked as operating profit to sales (P4), long-term assets to total assets (AS1), inflation (INF), current profitability (P5) and volatility current profitability (RISK2) according to their effectiveness levels. There is a positive correlation between total debt levels of the firms and inflation levels and a negative correlation between operating profit to sales, current profitability, long-term assets' rate and volatilities in net incomes, detected.

For the firms in the second group, latest emerged model is the eighties one. It can be seen that this model consisting of variables, is able to explain 42 % of the variance in the total debt rates of the firms in the second group. In this model, all variables in the first model excluding inflation also included. In addition to these variables, depreciation rate called non-debt tax shield (NDTS1), the

ratio of intangible long-term assets (AS6), growth opportunities (GO2), and volatility in EBIT to total assets (RISK3) made also a meaningful contribution. It has been detected that other than the ratio of intangible long-term assets and growth opportunities, all other variables are negatively correlated to the total debt rates.

Tablo-2 Total Debts with Forward-Selection Regression Model

Size	Model		Non-Std.		Standar t				
			B	Std. Error	Beta	t	R	R^2	F
1	5	(Constant)	,608	,034		17,658	,572	,317	31,220***
		P4	-,311	,049	-,336	-6,305***			
		AS1	-,273	,052	-,241	-5,230***			
		INF	,222	,044	,230	5,001***			
		P5	-,460	,112	-,211	-4,094***			
		RISK2	-,827	,241	-,164	-3,428**			
2	8	(Constant)	,795	,027		29,822	,654	,418	41,433***
		P4	-,146	,042	-,152	-3,452**			
		AS1	-,370	,042	-,361	-8,893***			
		P5	-,718	,099	-,326	-7,274***			
		RISK2	-,533	,261	-,086	-2,043*			
		AS6	,699	,183	,140	3,817***			
		NDTS1	-,951	,249	-,148	-3,812***			
		GO2	1,035	,460	,085	2,251*			
		RISK3	-,294	,136	-,098	-2,161*			

***p<0,000;**p<0,01;*p<0,05

2.3.2. LTD Model (Long Term Debt/Assets Model):

Table-3 showed results of the forward-selection multiple regression analysis in order to model the long-term debts of the firms. When the *F* values are examined, it can be seen that both models are able to explain changes in the long-term debt rates in a statistically meaningful way. For the firms in the first group, latest emerged model is the fourth one. It can be seen that this model consisting of four variables, is able explain to 17 % of the variance in the long-term debt rates of the firms in

the first group. In this model, the variables are ranked as operating profit to sales (P4),non-debt tax shield (NDTS1), long-term assets to total assets (AS1) and growth opportunities (GO1) according to their effectiveness levels. There is a positive correlation between long-term debt ratios and long-term assets to total assets, non-debt tax shield and growth opportunities and a negative correlation between operating profits to sales, detected.

Tablo-3 Long-Term Debts with Forward-Selection Regression Model

| Size | Model | | Non-Std. | | Standart | | | | |
			B	Std.Error	Beta	t	R	R^2	F
1	4	(Constant)	,003	,016		,208	0,427	,172	17,921***
		AS1	,121	,027	,225	4,436***			
		P4	-,118	,022	-,269	-5,231***			
		NDTS1	,689	,143	,244	4,806***			
		GO1	,766	,365	,107	2,097*			
2	6	(Constant)	,090	,017		5,466	0,498	,238	24,475***
		AS1	,131	,027	,214	4,935***			
		RISK1	,009	,002	,251	5,758***			
		AS6	,552	,126	,185	4,383***			
		P5	-,277	,058	-,211	-4,803***			
		RISK3	-,394	,080	-,220	-4,929***			
		GO2	,724	,310	,099	2,333*			

***p<0,000;**p<0,01;*p<0,05

For the firms in the second group, latest emerged model is the sixth one. It can be seen that this model consisting of six variables, is able to explain 24 % of the variance in the long-term debt rates of the firms in the second group. In this model, the variables are ranked as volatility in operating profit (RISK1), long-term assets to total assets (AS1), volatility in EBIT to total assets (RISK3), return on asset (P5), ratio of intangible long-term assets (AS6) and growth opportunities (GO2), according to their effectiveness levels. There is a positive correlation between long-term debt ratios of the firms and ratio of intangible assets, the ratio of long-term assets, volatility in operating profit and

growth opportunities and a negative correlation between long-term debt ratios of the firms and volatility in EBIT to total assets and return on asset, detected.

3. ASSESSMENT

Factors effective on capital structures of the firms have been detected via TD and LTD models. (Table-2, Table-3, Table-4). Findings are parallel to both capital structure theories and the studies in the literature. Having said that, an opportunity to compare bigger and smaller firms in terms of their assets emerged by examining the asset sizes of the firms.

Sub-models of TD and LTD developed according to sizes of the firms are also come out to be statistically meaningful. It has been observed that TD sub model of small firms is able to explain 32 % of the variance in total debts and TD sub model of big firms is able to explain 42 % of the variance in total debts. On the other hand, LTD sub model of small firms is able to explain 17 % of the variance in long-term debts and LTD sub model of big firms is able to explain 24 % of the variance in long-term debts.

In these type of models accepted as an application of static trade-off model, in studies related to Turkey, Durukan (1997), Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) and Demirhan (2009) were able to explain variances in total debts by 66 %, 53%, and 17 % respectively. Same researchers were able to explain variances in long-term debts by 20 %, 28 %, and 4 %, respectively. Considering these ratios, percentages of the variances explained in this study could be favored as sufficient. In the studies of Durukan's (1997) and Booth, Aivazian, Demirguc-Kunt and Maksimovic's (2001) in which explainable variance percentages higher than in this study, it can be observed that in addition to firm-specific factors, industry-specific factors also included. It is quite possible that explainable variances' percentages lower than those studies because of the fact that industry-specific factors are not included in this study. In the studies testing the factors explaining the variances in capital structures in developed countries, Bradley, Jarrell, and Kim (1984) were able to explain 58 % of the total variance (including industry-specific factors), Frank and Goyal (2009) were %32 and Rajan and Zingales (1995) were 12 %-30 %.

Tablo-4 Findings of Factors Affecting Capital Structure*

Variable Subclass	Symbol	Capital Structure			
		TD Models		LTD Models	
		SMALL	BİG	SMALL	BİG
Makroekonomice	INF	+			
	GDP				
	STOCK				
	P2				
Profitability	P4	-	-	-	
	P5	-	-		-
	AS1	-	-	+	+
Asset Structure	AS4				
	AS5				
	AS6		+		+
Growth Opportunities	GO1			+	
	GO2		+		+
	GO3				
Non-Debt Tax	NDTS1		-	+	
	NDTS2				
Tax	TAX				
Risk	RİSK1				+
	RİSK2	-	-		
	RİSK3		-		-
	R^2	%32	%42	%17	%24

* All + and - marked variables are statistically significant. Other variables were removed from the model by SPSS because they did not make a meaningful contribution.

3.1 Total Asset Value and Capital Structure:

Asset values of the firms included in the research were not normally distributed (APPENDİX). Standard deviations of the means of the assets were quite high, pointing out the fact that there are many variations between firms in terms of asset sizes. By this reason, asset sizes must be checked in all analyses. As it can be seen in TD and LTD models, there are considerable differences in the models emerged for the big and small firms in terms of asset size.

In TD models, there is 10 % of a difference in R^2 values of the both models. It is quite possible this difference is stemming from the fact that variation between the relatively bigger firms is higher (Table-2). In variables of both TD, models there are considerable differences. The difference between the values of R^2 of LTD models is relatively lower than in TD models. There is 6 % of a difference in every two models. It is even harder to explain the changes in long-term debts with firm-specific factors for smaller firms. As it can be seen in TD and LTD models, when firms are classified according to their asset sizes, the factors effective on their total and long-term debts are changing to a large extent. The possible causes of these differences stated below based on factors.

The fact that in total debt, only smaller firms are affected by inflation (INF) is quite possibly related to the fact inflation is lowering smaller firms' operating profits. The firms whose operating profit is declining may tend towards to short-term financing options. In this case, their total debt would increase. On the other hand, depreciation (NDTS1) reductions only decrease bigger firms' debts as an alternative to debts. The reason of this situation is quite possibly the fact that depreciation amounts of the bigger firms could be high enough to satisfy their short-term financing needs. The reason of why bigger firms borrow more in return to their intangible long-term assets (AS6) could be the fact that investors may not want to invest more in firms in the return of intangible investments. In this case, the firm could be financing such investments with debt.   As well as, growth opportunities of the firms based on sales (GO2) may not be that attractive for the investors. In such cases, firms could be using debt as an alternative financing method.

3.2. Asset Structure and Capital Structure:

In both TD and LTD models, prominently, one of the most important variables is the ratio of long-term assets to total assets (AS1). Nonetheless, the directions of the correlations that this variable is making with total and long-term debts are different from each other. An increase in the ratio of long-term assets to total assets is decreasing the total debt while it is increasing long-term debt for both bigger and smaller firms. This is true for both relatively small and large firms. Similar findings

also detected by Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001), Doğukanlı and Acaravcı (2004) and Demirhan (2009).

The observed decrease in total debt with an increase in the ratio of long-term assets to total assets is parallel to the consideration of Marsh's (1982) in which he states that long-term assets must be financed with long-term debts and current assets must be financed with short-term debts. Myers (1977) also similarly stating that the firms which are in a pursuit of a solution for insufficient investment must match their debts' and assets' terms. According to Myers (1977), a firm could solve its insufficient investment problem only by this way. On the other hand, the firms which have both high growth opportunities and debt may miss some of the investment opportunities. From this point of view, it is expected that firms would finance their current assets with short-term debts and long-term assets with long-term debts. In fact, there is a positive correlation between long-term assets' rates (AS1) and long-term debt rates of the firms. This situation is same for both bigger and smaller firms.

 It has been observed in the corporate finance studies that firms with the higher long-term asset to total asset ratios would prefer long-term debt by considering liquidity needs. (Harris & Raviv, 1991). In lenders' perspective, long-term assets are considered as collaterals. If long-term assets can be used as collaterals, agency costs of the debts would decrease. On the other hand, in the financial difficulty or bankruptcy cases, long-term assets' rate is increasing the liquidation values. By this reason, trade-off theory also foresees a positive correlation between long-term assets' ratio and debt. Therefore, the positive relationship between the ratio of long-term assets and long-term debt of firms' in Turkey is coherent with both representation and balancing theories.

It has been observed that when intangible long-term assets of the bigger firms with bigger asset sizes (AS6) increase, both their total and long-term debt also increase. This situation is hard to explain with agency and trade-off theories. Since intangible long-term assets could not be considered as, collaterals and it also would decrease the value of the firm in the time of financial difficulties. Further, the positive correlation between intangible long-term assets and debt could be

better understood in an asymmetric information perspective. Stakeholders because of asymmetric information could understand investments made by intangible long-term assets as risky investments, consequently, stakeholders' expectations in terms of return would increase. This situation may lead debt rather than stocks. From this perspective, an increase in both total and long-term debt with an increase in intangible long-term assets is coherent with pecking order theory.

3.3 Profitability and Capital Structure:

Return on Asset (P5) and profitability based on sales (P4) variables are making meaningful contributions to TD and LTD models. It is safe to say that, by looking at the negative correlation between debt and profitability, firms would choose profit over debt in order to finance their investments. This situation has proven many times before in finance literature. (Titman & Wessels, 1988; Rajan & Zingales, 1995; Durukan, 1997; Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001; Doğukanlı & Acaravcı, 2004; Demirhan, 2009; Frank & Goyal, 2009; Dinçergök & Yalçıner, 2011; Sayılgan & Uysal, 2011). Rajan and Zingales (1995) detected that the negative correlation between debt and profitability is increasing proportionally with the sizes of the firms. A similar finding is also valid for return on asset (P5) in TD model. According to the model, a 1 % increase in return on asset of the bigger sized firms is leading to a 0, 7 % increase in their total debts. As well as a 1 % increase in return on asset of the smaller sized firms is leading to a 0,3 % increase in their total debts.

The meaningful contribution of return on asset and operating profit based on sales in both TD and LTD models is compatible with pecking order theory. According to this theory, firms would choose internal financing (auto-financing) over external financing. In other words, if a firm has to make a decision between retained earnings and debt, it would choose retained earnings. From this perspective, it is normal to have a negative correlation between debt ratios and profitability's of the firms.

3.4 Growth Opportunities and Capital Structure:

Bigger firms which have growth opportunities based on sales (GO2) are borrowing more both in the total and long-term. On the other side, smaller firms, which have growth opportunities based on assets (GO1), are borrowing more in long term. It is safe to say that bigger firms with growth opportunities are borrowing more both in total and long term than the one does not, based on these findings. Similar findings also detected by Durukan (1997), Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001), Doğukanlı and Acaravcı (2004).

Pecking order theory foresees that investments would lead to an increase in debt as long as profitability rates remain the same. According to this theory, firms with growth opportunities could close the financing gaps via debts while making investments. The positive correlation between growth opportunities and debt while profitability rates are fixed found in model proves that firms in Turkey are financing their investments primarily with internal resources, then they would tend towards debts and that they are acting compatibly with pecking order theory. From this perspective, it is normal to have a positive correlation between leverage and growth opportunities. (Frank & Goyal, 2003).

The prominence of growth opportunities based on sales in bigger firms and growth opportunities based on assets in smaller firms could be explained by the trust and collateral factors. Frank and Goyal (2009) foresee a positive correlation between growth opportunities based on sales and debt by pointing out the idea that firms with high sales volumes are more profitable; therefore, they are more trustworthy. Same researchers stated that a growth opportunity based on assets forms a warranty for the debts. In this case, bigger firms may use collaterals based sales and smaller firms may use collaterals based on assets while borrowing. This situation could be explained by secured debt statement in agency costs approach.

3.5. Risk and Capital Structure:

Findings on firm risks have shown that risk is decreasing debt. These findings on risk factor are compatible with the other findings in former studies. (Bradley, Jarrell, & Kim, 1984; Durukan, 1997;

Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Nonetheless, the volatility in operating profit of bigger firms making a positively directed impact on their long-term debts. This variable also made the biggest contribution to the models. Under normal conditions, it is expected that risks would negatively affect debt, however; an increase of the volatility in operating profit led to an opposite way of correlation. If operating profit is considered as an alternative to debt, then, an increase in the volatility in operating profit may direct the bigger firms who in need of financing to long-term debt. Such an attitude is compatible with pecking order theory. However, the absence of ratio of operating profit to sales (P4) draws question marks on the validity of this explanation.

Return on asset and volatility in EBITDA are negatively affecting the debt ratios, as expected. According to the trade-off theory, increases in risks would lead firms not to repay their interests and firms may face financial difficulties. Hence, findings on these variables are compatible with trade-off theory. It is caught into attention that the volatility in return on asset is only observed in TD models while there was no volatility in return on asset in LTD models. This situation is related to the nature of volatility in return on asset as risk parameter. Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) stated that the volatility in return on asset could only measure the volatility in short-term operations and it is not able to foresee the risks within long-term operations. Together with this explanation, as well as considering the fact that most of the total debts are consists of short-term debts; it is understandable that the volatility in return on asset could only be foreseeing the risks within total debts. Having said that, Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001), in their studies also including Turkey, detected a negative correlation between total debt ratios and volatility in return on while they could not detect any correlation between long-term debts and volatility in current profitability.

3.6 Non-Debt Tax Shield and Capital Structure:

Depreciation rate as the non-debt tax shield (NDTS1) has a negative and meaningful correlation with total debt of bigger firms. In the studies about Turkey, there are findings of the fact that items that could be stated as expenses in B/S such as depreciation and investment incentives are forming

an alternative to debts, consequently, as these expenses grow, firms are borrowing less. (Durukan, 1997; Demirgüç-Kunt & Maksimoviç, 1999).

An increase in the non-debt tax shield (NDTS1) is also increasing long-term debts of smaller firms. Same kind of a positive correlation is also found in Bradley, Jarrell and Kim's (1984) study. Subjected researchers thought the reason of this situation is the amount of depreciation. According to this explanation, as the depreciation amounts increase, especially the assets, which can be used as collaterals against long-term debts, also increase. The firms with such big asset sizes borrowing more based on this warranty. Increase in growth opportunities based on assets is also increasing long-term debts of smaller firms. Hence, these two findings are found supporting each other.

The fact that non-debt tax shield is decreasing the debt rates is compatible with trade-off theory. According to this theory, if a firm were able to receive the tax reduction needed with depreciation expenses in B/S, then it would not need to borrow. The simultaneous increase of non-debt tax shield and long-term debts of smaller firms is also consistent with agency costs theory. The increase of non-debt tax shield or depreciation is also related to the increase of long-term assets in total assets. It means that smaller firms could provide their financing needs via long-term debts by stating their assets as warranty. When the factors effective on long-term debts of smaller firms are considered, the ratio of long-term assets and growth opportunities based on sales turned out to be also important as well as depreciation. The fact that long-term debts of smaller firms are positively correlating with these three variables is closely related to the collaterals that smaller firms have to obtain for their long term debts.

3.7 Inflation and Capital Structure:

It has been observed that smaller firms borrow more against inflation. A similar finding is also found by Frank and Goyal (2009). When the fact that inflation is melting the operating profits is considered, smaller firms face the most effects. This is also compatible with pecking order theory. According to this theory, firms tend to provide their financing needs from profits. When the earnings are not sufficient, they tend toward to debt. When the share of short-term debts is higher

in total debts of smaller firms, these firms may have to borrow more because of the disappearing profits against inflation.

4.8 Tax, Stock Market, GDP and Capital Structure:

The findings obtained from this study could not provide a proof of the idea if the debt is a function of corporate tax or not. The reason why tax rates in not an important factor on firms' debt are that either they do not have a sufficient amount of tax base and/or they may be using other tax shielding factors against debt. On the other hand, the most preferable choice for the firms for their financing needs is retained earnings and this situation is stemming from the asymmetric information in markets. In most of the studies related to Turkey, it has been stated that firms are making decisions between alternatives of financing rather than forming an optimum capital structure. This situation strengthens the possibility of asymmetric information between markets and investors. If asymmetric information theory is valid for Turkey and if firms are making a pecking order in their financing decisions based on this, it is safe to say that in this case, firms would not set a goal of forming an optimum capital structure and therefore tax rates would not be playing a crucial role in firms' financing choices.

CONCLUSION

This study aimed to calculate effects of capital structures of industrial firms on their firm values and performances. Since the composition of capital structures of firms cannot be separated from the firm-specific and macroeconomic factors, the study began with the analysis of the factors effective on capital structure. These analyses revealed statistically meaningful findings related to total and long-term debt rates of big and small firms. According to these findings, firms with relatively higher retained earnings tend to borrow less. Firms are financing their current assets with short-term debts and long-term assets with long-term debts. Firms, which have growth opportunities based on sales and are experiencing an increase in intangible long-term assets, are borrowing more both in the total and long term. Smaller firms, which have growth opportunities based on assets, are borrowing more in the long term. Non-debt tax shield is increasing long-term debts of smaller firms

while it is decreasing total debts of bigger firms. Volatility in return on asset is decreasing total debts. Inflation is causing higher debt in total for smaller firms while Volatility in EBITDA is decreasing both total and long-term debts of bigger firms.

In addition to these findings, several differences and similarities between big and small firms drew attention. For smaller firms, retained earnings and risk factors are making a negative impact on their total debt rates while for bigger firms, in addition to these factors there are also factors making a negative impact on total debt ratios such as non-debt tax shield. Moreover, both big and small firms tend to finance their current assets via short-term debts. By this reason, total debt of firms in both groups is decreasing with increase in long-term assets. Furthermore, inflation for smaller firms and intangible long-term assets for bigger firms are other items that are taken into account. For the long-term debts, for smaller firms, items that could be considered as collaterals and for bigger firms, sales volumes came to the forefront in terms of lenders' perspectives.

In the light of aforementioned points, there are concrete proofs of the claim of the firm in Turkey are considering both financial difficulty costs and other market conditions such as asymmetric information and transaction costs while forming their capital structures. Using asset structure as a collateral especially against long-term costs, avoding risks and benefiting from non-debt tax shields; all of these conducts of firms are pointing out the fact that firms are tend to balance their debts and equity. The facts that profitability is decreasing debtedness, firms with growth opportunities are borrowing more and especially bigger firms are tend to finance their intangible investments via debt are proving that firms prominently prefer internal financing resouces, than they are forced to tend towards debts if internal resources are not sufficient enough. In other words, it has been observed that firms are either trying to find a balance between equity and debt or using firstly their capitals secondly using debts by making a pecking order, depending on the situation. Smaller firms focused more on balancing than bigger firms while balancing behaviors are observed in long term debts.

APPENDIX

The Sizes of the Firms According to Assets

ASSET		N	Minimum	Maximum	Mean	Std. Deviation
1	TOTAL ASSET	390	4,607.604	427.763.634	205.828.843	1,17382E8
	Valid N	390				
2	TOTAL ASSET	390	429.559.451	17,114.140.000	2,586.562.692	2,83346E9
	Valid N	390				

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