Capital Structure in an Emerging Stock Market: The Case of Turkey[*]

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Abstract

Capital structure is an important factor in planning and realising operations of a company. Operations and decisions of a company shape the capital structure. The aim of this paper is to investigate the firm-specific determinants of capital structure under changing economic conditions in Turkey. The paper applies panel data analysis for manufacturing firms listed on the Borsa Istanbul (BIST) over the period of 2003-2011. Results show that, established theories such as trade-off, pecking order, and market timing fail to explain the observed leverages adequately, largely made up of short time debts. This outcome is not surprising as most of the assumptions of these theories are effective for the developed markets, which are not in force in the developing countries.

Keywords: Capital Structure, Panel Data Analysis, Manufacturing Industry, Emerging Markets.

JEL Classification Codes: G30, G31, G32.

Gelişmekte Olan Bir Piyasada Sermaye Yapısı: Türkiye Örneği

Öz

Sermaye yapısı bir işletmenin faaliyetlerinin planlanmasında ve gerçekleştirilmesinde önemli olan ve aynı zamanda bu faaliyetlerin sonucu olarak şekillenen bir faktördür. Bu çalışmanın amacı, Türkiye'deki işletmelerin sermaye yapısına etki eden firmaya özgü belirleyicileri değişen ekonomik koşullar altında incelemektir. Bu çalışmada 2003-2011 yılları arasında Borsa İstanbul'da işlem gören üretim işletmelerinden elde edilen verilere panel veri analizi uygulanmıştır. Elde edilen sonuçlara göre, dengeleme, finansman hiyerarşisi ve piyasa zamanlaması gibi geleneksel sermaye yapısı teorileri, gelişmekte olan bir ülkenin işletmelerinden oluşan örneklemin sermaya yapılarını açıklamakta yetersiz kalmıştır. Bunun ana nedeni, bu teorilerin gelişmiş ülkeler için geçerli olan varsayımlara dayandırılmış olmasıdır.

Anahtar Kelimeler: Sermaye Yapısı, Panel Veri Analizi, İmalat Sanayi, Gelişen Piyasalar.

JEL Sınıflandırma Kodları: G30, G31, G32.

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1. Introduction

Capital structure has been discussed in corporate finance for over decades. Majority recognize that a balanced leverage benefits the company in many ways. Capital structure emerged as an important factor from the start of the industrial revolution that caused accumulation of wealth, need of funds for new investments, and separation of capital owners and users (Swanson, Srinidhi and Seetharaman, 2003, 12). Though debt/equity mix was the case in the existence of financial intermediaries, in 1958 Modigliani and Miller (MM) put it in on theoretical basis asserting weighted average cost of capital is irrelevant to type of financing and companies cannot increase their values by changing capital structure. MM based their theorem on the perfect capital markets assumptions such as the perfect substitution of equity and debt instruments and the absence of asymmetric information, bankruptcy costs, and taxes. Their conclusions caused debates on which of their assumptions are important in imperfect markets. Most studies focused on whether capital structure and market value are related, and what factors influence capital structure decisions (Megginson, 1997). Though a vast amount of literature exists, ambiguity prevails in financing mix choices that may be vital for sustainability of the companies and their economies. Established theories can be classified in to two groups, static approaches that imply a target debt/equity motivation in the managers' mind and dynamic approaches where companies' behaviour changes in accordance with the conjectures without a set target to maximize company value (Teplova, 2000, 152).

The static approaches assume optimal capital structure increases the firm value decreasing the demands such as taxes, bankruptcy and agency costs (Chakraborty, 2010). Thus, a firm's target leverage is decided by balancing the costs and profits of debt. MM corrected their original thesis in 1963, adding a tax shield consideration in value maximization, which implies a 100% debt ratio is the best. Miller (1977) expanded the paradigm suggesting a shifting leverage depending on the levels of corporate and personal taxes is more realistic since market players behave as "tax clientele" who seek the advantages of tax ratios (Miller, 1977). De Angelo and Masulis (1980) put forth that non-debt tax shields like depreciation replace tax-based protections decreasing the use of debt. Financial distress and bankruptcy costs act as a balancing element limiting optimal debt/equity ratio shifting in extremes implied by MM and Miller models. Higher probability of bankruptcy due to insolvency increases the cost of capital, as investors are concerned with financing mix and the company is prone to lose competitiveness in fields of activities in financial distress without financial flexibility (Myers, 1984; Phillips, 1995). However, leverage is not the sole signal of financial distress as same debt level companies show distinct performances, corporations take this effect seriously in shaping capital structure (Haugen & Senbet, 1978). Stakeholders come together under a corporations' roof to pursue their own interests and conflicts are inevitable since risk perceptions are different (Fama &

Jensen, 1983). Deviation of shareholders, managers and creditors from rational behaviour lead to agency costs between shareholders and managers as well as shareholders and creditors. The costs of the former include the auditing costs, the bonding expenses of the managers, and 'residual loss' due to the deviation of managers' decision (Jensen & Meckling, 1976). There are four major sources of conflict in terms of agency costs between shareholders and creditors: dividend payments, claim dilution, asset substitution, and under-investment (Frydenberg, 2004). There are opportunity costs even in perfect markets and adding agency costs may worsen the results of the decisions.

Dynamic approaches are based on the nonexistence of perfect markets. Ross (1977) asserted that there is asymmetric information in the real world where interest groups do not have equal opportunity to learn the "inside" of the corporation in a timely manner. Capital structure is a signal to the market about company perspectives; issuing debt is considered as a positive signal, while equity issue is perceived inversely in terms of company value (Ross, 1977). Creditors follow these signals as financing decisions may lead to asset substitution eroding their interests (Stiglitz, 1988). Myers & Majluf (1984) suggested that companies follow pecking order in shaping capital mix to sustain financial flexibility and have the "freedom of choice" in an asymmetric information environment; corporations prefer internal finance first, followed by debt and equity. Baker & Wurgler (2002) suggested capital structure is composed by market timing theory where firms' take advantage of seasonal opportunities issuing equity when stock prices are high, issuing debt when stock prices are low and vice versa. In the pecking order view, managers try to save the corporation from the information asymmetry while market timing assumes managers try to take advantage of it.

Static approaches explain long-term capital structure behaviour whereas short time behaviour is better explained by dynamic approaches (Koller, Goedhart & Wessels, 2005, 480). To sum up, trade off, agency costs, pecking order, and market timing theories are not competing theories. In contrast, they all complement each other to explain observed capital structure decisions and it is almost impossible to decipher financing behaviour without considering all.

After presenting a brief literature review, in Section 2, we summarize capital structure determinants used in the study. Section 3 explains data and methodology. Section 4 deals with the empirical analysis and in Section 5 our conclusion.

2. Theoretical Determinants of Firm Specific Capital Structure

Capital structure measures can be classified in to two groups: ratio of debt to assets and ratio of debt to equity. Market values and book values are used in leverage ratio. We used book values in our study as the two have high correlation (Bowman, 1980, 242). If the managers make their decisions based on the book

values, preferring book values to market values would be more reliable (Almazan & Molina, 2005, 263). We used three leverage measures: total debts to assets following Wiwattanakantang (1999); long term debt to assets following Tang & Jang (2007), and short term debts to assets. Short-term financing is a long-term strategy in Turkey making up about 70% of total debts in our sample. Seval states the dominance of short-term debts in her study in 1981, which has been observed as a common trend in many studies.

Independent determinants of capital structure that used in the study are explained below;

Firm Size: Trade-off, pecking order, and agency costs approaches commonly view firm size is positively related to capital structure. Larger firms have a wide range of activities, stable cash flows, more profits to shield or invest and lower possibility of financial distress (Titman & Vessels, 1988, 6). Large corporations are more transparent and less exposed to disadvantages of asymmetric information and agency costs implying leverage increases with size (Rajan & Zingales, 1995). Transaction costs and barriers of entry to financial markets are major drawbacks for smaller companies. We adopt natural *logarithm of total (LNTA)* assets as firm size proxy following Deesomsak, Paudyal & Pescetto (2004). While majority of studies find a positive relation between leverage and firm size, there are a considerable number of papers expressing a negative or no relation (Akman, 2012, 154).

Growth Opportunities: The effects of agency problems and information asymmetry are expected to be more significant for growing companies and wider investment alternatives increase cost of debt (Bhaduri, 2002). Hence, a negative relation between long-term debt and growth opportunities is expected. Short-term debt ameliorates cited problems and enables the firms to realize optimal investments (Titman & Vessels, 1988). We use *research and development costs to net sales to* express growth opportunities *(RDTS)* in line with Titman & Vessels (1988). Earlier studies exhibit that corporations in the developed world have enough internal resources to fund new investments, while firms in developing countries depend on the debt (Titman & Vessels, 1988; Hosono, 2003; Tong & Green, 2005; Durukan, 1997).

Market Timing: The theory assumes that managers "time" the market for the advantage of the company. Market timing can be possible in perfect markets for companies with financial flexibility. We used *market to book value (MTB)* like Baker and Wurgler (2002) in our study to test this behaviour. This proxy is also used to express growth opportunities in several studies. The study of Fan, Titman & Twite (2012) supports market timing while Bhaduri (2002), Chen (2004) and Burca (2008) reach the opposite conclusion.

Taxes: Taxes have the key role in trade off theory. Effect of taxes in leverage changes depending on the tax level of the company (Rajan and Zingales, 1995; Fama and French, 2002). We take *the ratio of taxes to earnings before taxes (TEBT)* following Albayrak and Akbulut (2008). Though taxes have been a triggering concept, results on the effects of taxes are ambiguous.

Non-debt Tax Shield: Firms use depreciation and other incentives to protect their profits as a substitute to debt based tax shields (De Angelo & Masulis, 1980). We take *depreciation to total assets (DTA)* as proxy following Titman and Vessels (1988).

Asset structure: Companies with fewer tangible assets tend to issue equity while those with high collateral assets can obtain credits at lower costs and refrain from the disadvantages of issuing in financial markets (Myers & Majluf, 1984). The latter have lower bankruptcy costs, less prone to asymmetric information and agency costs. High tangible asset companies have higher expected leverage according to established theories. We take *the ratio of tangible assets to total assets (TATA)* as asset structure variable following Deesomsak et al. (2004). Deesomsak et al. (2004) and Titman & Vessels (1988) report a positive relation, while Chang et al. (2009) reach the opposite conclusion.

Profitability: Profitable companies have higher credibility, taxable income, and free cash flows that cause agency costs. Trade off and agency cost theories imply profitable companies prefer debts while pecking order theory argues the opposite since internal resources have priority. *Earnings before taxes to total asset (EBTA)* is adopted as profitability proxy. Majority of empirical studies like Titman and Wessels (1988), Wiwattanakantang (1999) and Fan et al. (2012) report negative relation between profitability and leverage.

Business Risk: Business risk is the probability of financial distress and deters a company from using more debt. Bankruptcy is inevitable when firms are unable to manage fluctuations in revenues and meet obligations. We used *rate of change in net sales (CIS)* and *interest coverage rate (ICR)* as a business risk variable. Business risk is an important criterion of credibility, but its effect on the capital structure is contrasting in previous studies. Chang et al. (2009) report a positive relation, while Homaifar, Zietz & Benkato (1994) report a negative relation and Titman & Wessels (1988) report irrelevance.

Asset Utilization: The presence of excess debt may cause under-investment and lower asset utilization in pecking order view. Agency theory in contrast argues debt has a disciplining effect and the managers attempt to get more out of their resources to increase asset utilization (Filbeck & Gorman, 2000). We take *the rate of costs of goods sold to total debts (CGTD)* as the proxy following Albayrak & Akbulut (2008) who report no relation between the variables. Filbeck & Gorman

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(2000) report a positive relation, while Ghosh, Cai & Li (2000) reach the opposite result.

Liquidity: Liquidity measure in the study is *current assets to short term debts (CAST)* and indicates coverage of short term debts by companies' own funds. Higher liquidity firms are able to finance their operations and investments with their own resources, so a negative relation between leverage and liquidity is logical. Ozkan (2001) and Bhaduri (2002) support this assumption.

3. Data

Manufacturing enterprises listed on the BIST were chosen for the study and 88 firms (about 50% of manufacturing companies in 2009) have been selected randomly. Nine firms having missed information dropped, and a balanced panel was prepared for 79 companies for the period of 2003-2011. This period has been chosen because, inflation accounting started in 2003 and using earlier years in the same analysis would cause errors. The data was obtained from the FINNET Financial Analysis database (www.finnet.com). E-Views 6.0 and Stata 10.1 were utilized to analyse the data.

Descriptive information about the sample is in Table 1. Turkish manufacturing firms depend on debt increasingly in the period of 2003-2011 with average debts/assets ratio of 0.47.

Fan et al. (2012) report that average long-term debt rate in developing countries is 36% and 61% in developed countries. A 30% long term debt rate indicates that companies in Turkey are among the lowest five in terms of long term debt rate along with China, Greece, Taiwan and Thailand. This is the result of creditors' behaviour as well as the borrowers' circumstances. Banks are primary finance providers and deposits are the main resources of banks with the average maturity of 50 days. Deposits to loans ratio is 105% showing effectiveness of banking sector and deficiency of domestic savings. Though there are efforts to increase the maturity of deposits, current conditions of the banking sector reduce the possibility of long-term lending (BRSA, 2010).

The abundance of empirical studies and ambiguity of results require a more careful variable selection. We identified 37 variables in 12 groups with extensive review of literature, eliminated weaker or correlating variables by means of correlation analysis for a more robust model and finally reached 11 variables explained above. Definitions of explaining variables and expected relationships are given in Appendix A.

Table 1: Descriptive Information about the Sample

Sector	Number of firms	Share of Companies in the Sample (%)	Share of Total Assets (%)	Short Term Debts/ Total Debts	Long Term Debts/ Total Debts	Debt/ Total Assets	Debt/ Equity
Textile. Wearing Apparel and Leather	11	14	4	0.70	0.30	0.46	0.91
Food. Beverage and Tobacco	11	14	4	0.76	0.24	0.56	1.32
Paper and Paper Products	5	6	1	0.75	0.25	0.28	0.40
Chemicals. Petroleum Rubber and Plastic Products	16	20	32	0.78	0.22	0.46	0.88
Basic Metal Industries	7	9	18	0.55	0.45	0.43	0.78
Fabricated Metal Products. Machinery and Equipment	14	18	24	0.72	0.28	0.63	1.73
Non-metallic Products	15	19	17	0.49	0.51	0.33	0.56
TOTAL	79	100	100	0.69	0.31	0.47	0.95

4. Methodology

This paper applies panel data analysis to estimate the determinants of the capital structure of Turkish firms. Panel data enables observation of the trends of entities across time. Panel data utilizes time series and cross-section data at the same time, therefore it is more efficient in explaining economic relationships (Baltagi, 2005; Greene, 2003: 612; Torres-Reyna, 2012). Our data set is a balanced panel consisting of 79 firms (cross sectional units); $i = 1, .., 79$ over 9 periods; $t = 2003, ..., 2011$.

The popularity of panel data has increased after Balestra & Nerlove (1966) estimated natural gas demand utilizing the method. This is due to data availability, greater capacity for modelling the complexity of human behaviour than a single cross section or time series data, and methodology with more simple computation as well as accurate inference of modal parameters (Hsiao, 2007).

Panel data concentrates on specific results, which are affected by multiple factors. The robustness of all econometric methods depends on the elimination of specific effects, the conformity of assumptions to the statistical method, and the characteristics of the data. Several tests explained below are applied to ensure this.

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4.1. Stationarity Tests

If time series records are not stationary or have a unit root, the large sample approximation of the scatterings of the least squares or maximum probability estimators are not normally distributed, which causes spurious relations between the variables (Hsiao, 2007). We use Levin, Lin & Chu (LLC) for testing common unit root, Im-Pesaran-Shin (IPS) test for unit root for each corporation, and augmented Dickey-Fuller (ADF) for each cross-section independent of individuals. There are several unit root tests in the literature; LLC, IPS and ADF tests are more common (Unlu, Bayrakdaroglu & Samiloglu, 2011, 9).

All three tests are utilized to question if there is a unit root and the following hypotheses are proposed;

H_0: Time series contain a unit root

H_1: Time series are stationary

The results of the unit root tests are seen in Table 2. Probability values calculated for each variable are lower than the critical value (0.05) which enables us to reject the null hypotesis. Results showed the series don't have a common and individual unit root. The series are stationary in the given period and suitable for panel data analysis. The *Company size (LNTA)* variable had unit root and the first differences were taken to obtain stationary series. After this application ($\Delta=LNTAt-LNTAt-1$) the tests were run again, the stationarity of the series was proven and this variable was used in the model.

Table 2: Results of Unit Root Tests

Variables	Levin, Lin and Chu t*		Im, Pesaran and Shin W-stat		ADF - Fisher Chi-square	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
TDTA	-22.2675	0.0000	684.192	0.0000	674.565	0.0000
STDTA	-7.96525	0.0000	-2.34437	0.0095	241.044	0.0000
LTDTA	-35.8768	0.0000	-8.87335	0.0000	320.535	0.0000
LNTA*	-41.315	0.000	-17.3176	0.000	562.104	0.000
RDTS	-6.81227	0.000	-1.66536	0.048	101.2	0.055
MTB	-10.2622	0.000	-4.03629	0.000	262.175	0.000
TEBT	-25.1191	0.000	-22.2092	0.000	484.561	0.000
DTA	-28.4399	0.000	-9.602	0.000	373.436	0.000
TATA	-13.0092	0.000	-2.68811	0.004	246.151	0.000
EBTA	-21.6661	0.000	-7.98256	0.000	341.076	0.000
CIS	-48.2254	0.000	-13.6119	0.000	425.235	0.000
ICR	-28.5689	0.000	-11.4778	0.000	422.095	0.000
EDTA	-18.2843	0.000	-9.09888	0.000	382.758	0.000
NSST	-12.3213	0.000	-3.42422	0.000	234.625	0.000
CGTD	-17.1975	0.000	-5.00398	0.000	262.785	0.000
CAST	-8.31412	0.000	-2.63348	0.004	219.808	0.001

LNTA first difference (First differences are used in order to have stationary series.)

4.2. Panel Data Model Selection

Panel data analysis offers different types of testing for the data set: pooled regression, fixed effects, or random effects. The panel data regression model is commonly expressed as

$$y_{it} = \alpha_{it} + \beta_{it}x_{it} + \varepsilon_{it} \qquad (1)$$

Where y and x represent dependent and explaining proxies consequently, α and β are coefficients, ε_{it} is error term, i and t are indices for individuals and time. If there are no specific fixed effects of individuals and time-related effects, pooled panel regression (ordinary least squares-OLS) produces best results (Yaffee, 2003).

Breusch & Pagan's (1980) Lagrange multiplier (LM) test checked for the existence of random effect, while the Chow test was used for fixed effect. The former compares random effect model with OLS and the latter compares fixed effects and OLS. Hausman test was employed for the suitability of random or fixed effect estimators and final decision wasmade (Park, 2011).

The Breusch-Pagan (B-P) is used to determine whether the pooled OLS is an appropriate model. B-P test the possibility of using the pooled model rather than the random effects model under the assumption of the variance of individuals' effect is zero. The statistical hypotheses are as following;

H_0= Pooled Model; $\sigma_\alpha^2=0$

H_1= Random Effects Model; $\sigma_\alpha^2>0$

Table 3: Results of Breusch-Pagan Test

Model	Dependent Variable	Chi-sq	Prob. LM>*Ki- square*
Model 1	*TDTA*	725.60	0.0000
Model 2	*STDTA*	569.32	0.0000
Model 3	*LTDTA*	472.63	0.0000

As seen in the Table 3 the probability of LM statistics being larger than Chi-square value is lower than the critical 0.05, so we can reject the null hypothesis accepting that the random effects model better estimate the results than pooled model. The error term ε_{it} which have correlation with regressors, is very important in this analysis.

The B-P test assumes T is infinite. F statistics are applied to check the poolability of data with limited T. The F test enables us to decide whether the pooled or the fixed effects method is suitable.

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As seen in Table 4, it is confirmed that cross section slopes are not the same and the pooled model is not suitable. The value of Probability > F test statistic is lower than the critical 0.05 and null hypothesis, which states fixed effects are insignificant is rejected.

Table 4: Results of F (Chow) Test

Model	Dependent Variable	F-Test (cross section/ period)	Prob. > F
Model 1	*TDTA*	86.612	0.0000
Model 2	*STDTA*	86.612	0.0000
Model 3	*LTDTA*	86.612	0.0000

After elimination of pooled model, eligibility of fixed or random effects models for the panel should be decided. This decision is made utilizing the Hausman test and hypotheses are as following;

H_0: Error term (ε_i) is uncorrelated with X_i (Random effects)
H_1: Error term (ε_i) is correlated with X_i (No Random effects)

Table 5: Results of Hausman Test

Model	Dependent Variable	Two-Sided Random Effects (Cross-Section and Period)	Probability
Model 1	*TDTA*	418.43	0.0000
Model 2	*STDTA*	322.13	0.0000
Model 3	*LTDTA*	231.64	0.0000

The Hausman Test results are seen in Table 5. The probability value below 0.05 shows that the random effects model is not suitable and that the fixed effects model should be preferred. As seen in the Table 5, Prob=0.0000<0.05 in all models, null hypothesis is rejected and the fixed model method is the best to estimate the models.

The model that specifies capital structure (Y) for each company (i) on the given period (t) for the fixed effects is:

$$Y_{it}=\beta_{1i}+\beta_2 LNTA_{it}+\beta_3 RDTS_{it}+\beta_4 MTB_{it}+\beta_5 TEBT_{it}+\beta_6 DTA_{it}+\beta_7 TATA_{it}+\beta_8 EBTA_{it}+\beta_9 CIS_{it}+$$
$$\beta_{10}ICR_{it}+\beta_{11}CGTD_{it}+\beta_{12}CAST_{it}+\varepsilon_{it} \qquad (2)$$

Where β_{1i} is the entity specific intercept not depending on time, $\beta_{1,2,\ldots11}$ are the coefficients of the explaining variables and ε_{it} is the error term.

4.3. Heteroskedasticity and Autocorrelation (HAC) Tests

Autocorrelation refers to the correlation between a time series' values. Autocorrelating observations provide less information than independent observations and ignoring autocorrelation produce misleading results (Hoechle, 2007, 281). Several tests are proposed to identify the correlation between error terms, but the Wooldrige test is better as it based on less assumptions and easy to apply.

The test hypothesis is established as following;

H_0: No autocorrelation

Table 6: Results of Wooldridge Autocorrelation Tests

Model	Dependent Variable	F value	Probability
Model 1	*TDTA*	10.019	0.0022
Model 2	*STDTA*	19.770	0.0000
Model 3	*LTDTA*	29.068	0.0000

Wooldridge autocorrelation test results are seen in Table 6 and null hypothesis is rejected for all three models that explain capital structure determinants in 2003-2011 periods. In other words, autocorrelation is observed between error terms.

Heteroskedasticity, which might be inherent between the error terms of cross sections, is the existence of non-constant variance and can lead to incorrect estimates (Agunbiade & Adeboye, 2012, 19). We apply the Wald test with null hypothesis as following to check.

H_0: Cross section error terms have constant variance.

Results of Wald test are seen in Table 7. Prob<0.05 and null hypothesis for homoscedasticity is rejected for all models.

Table 7: Results of Wald Heteroskedasticity Tests

Model	Dependent Variable	Chi-sq	Prob.
Model 1	*TDTA*	12804.35	0.0000
Model 2	*STDTA*	33715.60	0.0000
Model 3	*LTDTA*	74118.48	0.0000

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The tests confirm the presence of HAC in all models. Therefore, we used heteroskedasticity-robust standard errors for fixed effects panel data regression following Stock & Watson (2006). The traditional heteroskedasticity robust variance matrix estimator for cross sectional regression produces inconsistent results in fixed effect models. The estimator developed by Stock and Watson eliminates the HAC problem in fixed effect panel data models (Fischer & Poza, 2007; Nichols & Schaffer, 2007). Using the fixed effects model reduces the possibility of biased and inconsistent estimation caused by exogenous variables that contribute to the robustness of the model (Baltagi, Bressonb & Pirottec, 2003, 361).

5. Results

Results of standard error adjusted fixed-effects panel regression for each model are given in Table 8. F-statistics and F-values show that the models are reliable. R-square values indicate our models have significant explaining power; about 43% for *TDTA*, 36% for *STDTA* and 12% for *LTDTA*. Observed F and R-square values are consistent with the common idea that long term debts depend more on non firm-specific macroeconomic factors.

Models show that market timing has a positive and profitability has a negative significant effect on all types of leverage. Asset structure and liquidity have a negative significant relationship with leverage in terms of short term and total debts. Growth opportunities have a positive effect on total debts while insignificant for short-term and long-term leverage. Asset utilization rate negatively related to leverage expressed by total debts and long-term debt while insignificant for short-term debt. Models reveal that company size, taxes, non-debt tax shield, and business risk have no significant relationship with leverage.

Table 8: Results of Standard Error Adjusted Fixed-Effects (Within) Panel Regression

	Model 1			Model 2			Model 3		
	Standard Error adjusted for 79 clusters in id (Robust) Number of observations = 711 (2003-2011)								
	R-sq. within = 0.4281 Prob > F = 0.0000 F(11.78) = 15.55			R-sq. within = 0.3575 Prob > F = 0.0000 F(11.78) = 10.58			R-sq. within = 0.1230 Prob > F = 0.0001 F(11.78) = 4.11		
	TDTA			*STDTA*			*LTDTA*		
Variable	Coef.	t-Stat.	Prob.	Coef.	t-Stat.	Prob.	Coef.	t-Stat.	Prob.
LNTA									
RDTS	1.3659***	1.87	0.066						
MTB	0.0224*	4.85	0.000	0.0157*	3.8	0.000	0.0067**	2.14	0.035
TEBT									
DTA									
TATA	-0.3396*	-5.17	0.000	-0.3936*	-6.21	0.000			
EBTA	-0.4254*	-6.46	0.000	-0.2845*	-4.08	0.000	-0.1414*	-2.92	0.005
CIS									
ICR									
CGTD	-0.018***	-1.76	0.082				-0.0197**	-2.55	0.013
CAST	-0.0260*	-3.77	0.000	-0.0335*	-5.34	0.000			
C	0.6466	16.78	0.000	0.5387	14.8	0.000	0.1080	4.77	0.000

* Significant at 1% level, **significant at 5% level, ***significant at 10% level.

Profitability has a common negative relationship with leverage in both developing and developed countries, with the exception of the USA, Canada, and Ireland according to the recent study of Fan et. al. (2012). Undeveloped debt securities markets in the former and operation costs in the latter may be a reason, but not enough to explain this result. Profitable companies prefer internal resources, while companies not generating enough profit depend on debt as the pecking order theory suggests. A negative relationship of profitability and capital structure also indicates that the companies do not prefer debts for agency costs concerns. This fact is consistent if we consider the dominance of family-owned companies and banks as the primary financing resource in Turkey.

Çankırı Karatekin Üniversitesi
İktisadi ve İdari Bilimler
Fakültesi Dergisi

Çankırı Karatekin University
Journal of The Faculty of Economics
and Administrative Sciences

Although the companies see debt as secondary, leverage rates increase in the given period indicating inadequate profitability. Factoring is a financing alternative in lower liquidity and factoring volume increased 41% between 1990-2011 in Turkey while in comparison growing 12% in the World. (Association of Factoring, 2011). Factoring is the second largest financing sector in Turkey covering 6% of all trade. The trend of factoring supports the case of insufficient profitability in our results.

A negative relationship of asset structure and capital structure shows that the firms prefer financing fixed asset investments with equity. Preference of internal resources complies with the relationship of *EBTA*. The companies with high collateral value that completed major capital investments have better financial structure and profitability to finance their operations. Tangible assets in fixed assets rate (which is 40% on average) in the given period for the sample is decreasing as a result of depreciation and the increase is only possible with new investments. This decrease under increasing leverage may be explained as:

(a) the firms consider they reached optimum scale and do not prefer new investments,

(b) they consider new investments to the established mature plants unprofitable and invest in new sectors, non-tangible, or current assets,

(c) the companies use debts in covering operating costs rather than investments,

(d) leverage and earnings increase liquidity which is the case for the sample in the given period.

Tangible assets and depreciation depending on them are expected to increase with long-term debts as companies consider maturity matching (Booth et al., 2001). Fan et al. (2012) report a positive relation between leverage and tangibility for developing countries. Our results do not support the logical relation of *TATA* and *LTDTA*, indicating the companies face problems with maturity management, whichmay be an explanation of dependency on shortterm debts. Further studies need to be carried out to explain this paradox. Fixed asset investments are realized with internal resources (we have negative relation with *STDTA* here) and companies become dependent on short term debts to cover operating costs as their own financial resources weaken. Seval (1981) states similar results and explains this with the difficulty of acquiring long term debts and ineffective capital markets.

When the importance of inverse correlation of profitability on leverage is considered, it is the most influencing for *LTDTA,* while the second is *STDTA*, indicating companies with high liquidity prefer short term debts to long term debts.

Average market values of the sample did not fall below book values except for 2008 in the given period. *Market value to book value (MTB)* which is used as market timing proxy in our study shows how investors perceive the value of the company

assets, investments and future prospects. Our findings do not support the market timing theory, which states that the firms realize the increases of market value by issuing equity. Our results support Burca (2008) and Bhaduri (2002) while conflicting with Fan et.al. (2012).

Growth opportunities expressed as RD to TS rate, which is only 2 in a thousand for our sample, has a positive effect on total leverage implying companies depend on leverage for new investments. This result complies with the effect of *MTB*, which also has been considered as a growth rate proxy in several studies. There is a common negative relation in developed countries and positive relation in developing countries between leverage and growth opportunities complying with our results (Akman, 2012, 151). Turkey is a developing country with a GDP growth rate higher than the World average in the given period and a dynamic economy offering opportunities for entrepreneurs. Investors, who wish to gain profits in this promising market, sustain their operations dominantly depending on debt. The correlation between the growth rate of credits and GDP is as high as 68%, the fact supporting our finding that growth rate has a positive relation with leverage (BRSA, 2011).

There is no significant relation between leverage and company size (*LNTA*) contrary to the theoretical expectation that larger firms prefer higher leverage. Market to book value has positive effect on leverage as stated above. This indicates leverage is related to market value rather than book value, which are made up of total assets mainly. Titman & Vessels (1988) reached the same results and explained this as higher market value companies have higher credibility and debt capacity.

Taxes and non-debt tax shield have no significant effect on leverage. Findings about the taxes contrast the trade off theory assuming the firms see taxes as a crucial determinant of leverage. Fan et al. (2012) report tax effect on leverage is insignificant in emerging countries supporting our results. There is also no support for the assertion that firms prefer non-debt tax shield (*DTA*) to substitute debts. It is decreasing due to endogenous factors not related to leverage for the sample in the given period. This result is in compliance with the studies of Kula (2000) and Demirhan (2009) indicating, the firms consider incentives like R&D, capital allowance, etc. more important than savings provided by debt or non-debt tax shields.

It is observed that business risk considered as fluctuation of sales (*CIS*) and interest coverage rate (*ICR*) has no significant effect on leverage confirming the findings of Chen (2004), Demirhan (2009), and Frank & Goyal (2009). This result contrasts theoretical expectations of trade off theory stating companies in probability of financial distress decrease leverage and pecking order theory, which explain the same behaviour as the firms wish to protect debt capacity to avoid issuing equity. The effect of business risk should be considered in the frames of both companies and creditors. The companies increase leverage despite the financial distress if they have collateral, as their earnings are not enough to control debt usage. The creditors continue providing debts in presence of collateral since

current law and legal system, which have a significant effect on financial decisions and capital structure as Alves & Ferreira (2011) state, protect them. Another explanation is that creditors do not consider *CIS* enough to decide credibility as cash flows, *EBITDA*, other operating revenues, inventories, and liquid assets also have significant effect. Frank & Goyal (2009) state that corporate earnings are prone to be "arranged" to signal a positive picture by managers weakening explaining power of *ICR*. This argument may also explain the irrelevance of taxes and leverage in emerging countries with weaker corporate governance practices if companies can "arrange" the level of taxable income.

We made some comments on the picture our results provided, but the formation of capital structure depends also on non-firm factors. Yucel & Kurt (2002) and Buyuktortop (2007) who investigated capital structures of multinational companies assert that, multinational companies adjust their leverage according to the macroeconomic conditions and adapt the behaviour of local companies. Buyuktortop (2007) further states that leverage determinants of local and multinational companies are similar. Another point when assessing the outcomes is that our analysis covers an emerging country. Developing countries have higher short term debt rates, different institutional structures, banking, and capital market models that limit the explaining power of the conventional theories asserted for developed countries considering long term debt as capital structure (Booth et al., 2001). The conventional theories suppose the corporations manage leverage for the profit of the company. The adversity of explaining the capital structure behaviour of firms in emerging markets is in determining how much of the leverage is "manageable".

6. Conclusions

The companies in the sample cover half of their assets with equity while the other half is covered with debts. Debt preference depends on not only its benefits, but also the deficiency of capital in an environment offering opportunities. Major financing resource is banks and therefore results the study reveal concern mostly determinants of bank loans. Non-bank loan markets have huge growth potential, which will increase the flexibility of companies in building capital structure. Future studies on determinants of non-bank leverage can be considered. Dependency on short-term debts in emerging economies is also a case that can be dealt in further studies in the frames of the circumstances of creditors and companies. Our findings show that the firms do not prefer debt after reaching asset maturity and adequate profitability. However, average level of leverage increase in the given period. Consultancy for steering investments in the profitable direction arises a key point for balanced leverage.

The results panel data fixed effect model show that market timing and growth opportunities have positive effect on capital structure; profitability, asset structure, liquidity, and asset utilization have negative effect while company size, taxes, non-debt tax shield and business risk have no significant relationship with leverage. The

findings do not support market timing and trade-off theory. The negative effect of profitability on leverage implies pecking order is more suitable in explaining capital structure. However, it is hard to assert that this stems from the signalling effect pecking order theory is based on. Bank loans, which are not made public for signalling effect, dominate the debts of the sample. In conclusion, traditional theories are not enough to explain capital structures in developing countries. Because, most of the assumptions they make for the developed markets are not in use in the developing countries.

Acknowledgement

Appendix 1: Definitions of Explaining Variables of Leverage and Expected Relationships

Variables	Definition	Symbol
Company Size	LN (Total Assets)	LNTA
Growth Rate	RandD Expenditures/Net Sales	RDTS
Market Timing	Market Value/Book Value	MTB
Taxes	Taxes Payable/ Earnings Before Taxes	TEBT
Non debt tax shield	Depreciation/ Total Assets	DTA
Asset Structure	Tangible Assets/ Total Assets	TATA
Profitability	Earnings Before Taxes/ Total Assets	EBTA
Business Risk	Interest Coverage Ratio= EBIT/ Interest expenses	ICR
Asset Utilization	Costs of Goods Sold/ Total Debt	CGTD
Liquidity	Current Assets/Short Term Debt	CAST

Expected and Observed Relationship Signs

Variable Symbol	Trade off	Pecking Order	Market Timing	Agency Costs	Observed (Model 1)
LNTA	+	+		+	
RDTS	-	-		-	+
MTB			-		+
TEBT	+				
DTA	-				
TATA	+	+			-
EBTA	+	-		+	-
ICR	-			-	
CGTD		-		+	-
CAST	+	-		+	-

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