ISTANBUL BILGI UNIVERSITY

INSTITUTE OF SOCIAL SCIENCES

INTERNATIONAL FINANCE

CAPITAL STRUCTURE DECISIONS AND ITS IMPACT ON COMPANY'S RETURN PERFORMANCE

GRADUATE THESIS

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June 2016

CAPITAL STRUCTURE DECISIONS AND ITS IMPACT ON COMPANY'S RETURN PERFORMANCE

SERMAYE YAPISI KARARLARI VE İŞLETMENİN GETİRİ PERFORMANSINA ETKİSİ

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Tezin Onaylandığı Tarih : 24.08.2016

Toplam Sayfa Sayısı: 57

Anahtar Kelimeler (Türkçe)	Anahtar Kelimeler (İngilizce)
1) Sermaye Yapısı	1) Capital Structure
2) Finansal Kaldıraç	2) Financial Leverage
3) Sermaye Karlılığı	3) Return on Capital Employed

Acknowledgements

I would like to thank Mr. Cenktan Ozyıldırım for his guidance, Ms.Ebru Reis for her support and trust, my colleagues Faruk Turunç and Ozge Agırman for their great contribution on data collection and my family for their courage and understanding.

Abstract

The purpose of this study is to examine the relationship between capital structure decisions and company's return performance using a large sample of Turkish firms listed in Istanbul Stock Exchange (BIST). In this study panel data analysis has been used to determine relationship between ROCE (Return on Capital Employed) as dependent variable and "long term debt to equity" ratio as independent variable as well as EBITDA Margin, Current Ratio and Stock Price Volatility as control variables. Study has been iterated by using deferred ROCE variable on (t+1) and (t+2) periods. Significant negative correlation found between return and leverage on t and t+1 period but on t+2 period significant correlations could not be observed. Results of statistical study confirmed the pecking order theory as profitable companies will first utilize their internal funds before exploring external debt options.

Özet

Bu çalışmanın amacı sermaye yapısı kararları ile işletmenin karlılık performansı arasında bir ilişki olup olmadığının hisse senetleri Borsa İstanbul'da işlem gören geniş bir firma örneklemi kullanılarak Analiz edilmesidir. Bu çalışmada Panel Veri Analizi kullanılarak bağımlı değişken "İşletilen Sermaye Karlılığı" ile bağımsız değişken "Uzun Vadeli Kredilerin Sermayeye Oranı (Finansal Kaldıraç)" ve kontrol değişkenleri "Faiz, Vergi ve Amortisman Öncesi Kar Marjı", "Cari Oran" ve "Hisse Senedi Volatilitesi" arasındaki ilişki belirlenmiştir. Çalışma "İşletilen Sermaye Karlılığı" nın t+1 ve t+2 dönem verileri kullanılarak tekrarlanmıştır. T ve t+1 dönemleri için "İşletilen Sermaye Karlılığı" ile "Finansal Kaldıraç" arasında anlamlı ve negatif bir ilişki gözlemlenirken t+2 dönemi için anlamlı bir ilişki gözlemlenmemiştir. İstatistiksel çalışmanın sonuçları, karlı firmaların öncelikle birikmiş karlardan doğan iç kaynakları tüketmeden borçlanma yapmayacağını öngören Finansman Hiyerarşisi Teorisini doğrulamaktadır.

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Part 1

Introduction

1.1 Overview

It has been widely discussed in corporate finance universe that whether there is an optimal capital structure, in other word is there an optimal combination of debt and equity? Capital Structure decision is one of the key decisions taken by any firm. Determination of the optimal capital structure is the major challenge during the capital structure decision. No matter who is responsible for capital structure decision in a firm, various internal and external factors should be analysed well advance before the additional fund need arises. Capital structure decision is actually one component of the corporate finance decisions which ultimately target company's value maximization.

Academic discussions on the topic started with Modigliani-Miller's proposition in "The Cost of Capital, Corporation Finance and the Theory of Investment" published in June 1958 and followed with the study of Modigliani-Miller again which revised their initial study in 1963. Following M-M's theories, extensive theoretical and academic studies have been performed related to optimal capital structure which will be reviewed in Part 2. The main question throughout all these studies was whether capital structure or in other words financial leverage makes any impact on company's performance, return or value. Basically, M-M focused their study on cost of capital and tried to estimate the impact of financial leverage on firm's performance through cost of capital.

1.2 Cost of Capital

Cost of capital is the weighted average of, cost of long-term loan after tax, preferred stock, and the shareholders' equity related with common stock. The cost of capital is used for computing net present value of the cash flows in an investment or valuation of a company. It is also assumed to be the minimum acceptable after tax internal rate of return for new investments.

In a broad perspective, a firm funds its investment either through loan or equity. Weighted Average Cost of Capital is the average of the costs of these types of funding, each of which is weighted by its proportionate use in a given situation.

Debt and equity are the two elements which compose a firm's capital structure. Lenders and equity holders expect to get certain returns on the funds or equity provided by them. The cost of capital is the return that shareholders and debtors will expect to get, hence WACC implies the return that both kind of stake holders (shareholders and debtors) can expect to get. In other words, WACC is the opportunity cost of investor who takes the risk of investing funds in a firm.

A company's WACC is the overall required return for a company. Hence decision makers use WACC to make decisions internally.

1.3 Financial Leverage

Financial leverage is the percentage of debt to equity, which indicates the relationship between the debt and equity owner's funds in the capital structure of

a company. Financial leverage differs within companies and industries. Companies which have equity only are defined as 'unlevered firms', while companies which have both equity and debt are called as 'levered firms'.

Debt financing is funding of the company's projects by issuing loans as short-term loan, long-term loan, notes payable, loans payable, debentures, bonds etc. Interest of loan is tax deductible expense, and principal of loan and interest payments are being paid in fixed period of time. There is a cost of financial trouble associated with the loan. On the other hand, equity financing is the funding of the company's operations and assets by raising equity in the form of common and preferred stocks. There is not any commitment of interest or principal payments. Accordingly, equity is less risky than loan and brings more credibility to the company by raising the ability of the company for equity funding. However, the cost of equity is larger than the cost of loan. Hence, loan and equity funding has its own benefits and disadvantages. The company has to choice between loan and equity funding, considering the maximization of the company's value and minimization of the cost of capital.

It has been observed that in most of the countries, interest expenses are tax deductible and companies benefit the tax shield while funding new projects, new investments and expansions with external loans rather than shareholder's resources. This benefit of tax shield demonstrates the motivation behind the financial leverage up to a certain level where the extreme indebtedness may raise default risk thus each company has to choose optimal combination of loan and equity considering different other aspects like capital markets and access to

funds, interest rates, business strategy, tax strategy, risk appetite, partnership structure etc.

Part 2

Capital Structure Theories

2.1 Modigliani and Miller's Capital Structure Theory

Modigliani and Miller, two academicians in the 1950s, studied intensely on capital structure theory. The capital structure irrelevance proposition was developed after their analysis. Essentially, they assumed that in perfect market environment, it does not really matter which capital structure a company uses to fund its operations. In their theory the market value of a company is calculated by its earning capability and the risk of its underlying assets and this value is independent of the method the firm prefers to fund its investments. The basic Modigliani&Miller hypothesis is relying on the following key assumptions:

- No tax
- No transaction costs
- No bankruptcy costs
- Equivalence of market information, meaning firms and investors have the same/similar information
- Equivalence of borrowing costs for both firms and investors
- No effect of debt on the firms' profit before interest and tax

However, there are certain taxes, transaction and bankruptcy costs, diversity in borrowing costs, asymmetric information and effects of debt on firms' earnings in real market environment.

The M&M capital structure theory assumes that taxes and bankruptcy costs are not relevant for their irrelevance proposition. In this basic view, weighted average cost of capital (WACC) of a firm should be constant with changes in the firm's capital structure. As an illustration, regardless of how the firm borrows, there will not be any tax benefit from interest payments hence no impact to the WACC. Furthermore, since there is no any loss or benefit from increases in debt, capital structure does not have any impact on company's stock price hence the capital structure is irrelevant to the company's stock price. However, it is a reality that taxes and bankruptcy costs have significant influence on company's stock price. Modigliani and Miller added both the impact of taxes and bankruptcy costs in their later studies.

In brief, the original hypothesis of M&M introduced the irrelevancy of capital structure for determining the value of a company, since certain restrictive conditions which were defined by M&M or applied in their formulation implicitly. In 1963, to correct their initial hypothesis, M&M demonstrated that in the existence of corporate income taxation, the hypothesis of irrelevance was no longer true. As a result of the fiscal advantage provided by debt, increasing leverage will cause to decrease in the weighted average cost of capital, hence increase of a company's value.

2.2 Trade-off Theory

The trade-off models have influenced the capital structure literature intensively. The tax advantage bankruptcy cost trade-off models anticipated that firms shall target to manage an optimal capital structure through balancing the advantages and costs of the debt. The tax shield brings benefit considering the expected financial concern costs may increase. Under the agency theory models companies utilize the benefits of dealing with potential free cash flow issues and other conflicts between executives and equity holders, to balance costs associated with underinvestment and asset replacement issues. Those theories forecasted that companies keep an optimum capital structure where the marginal cost of debt equals the marginal benefit. The indication of those trade-off models is that companies do have targeted leverage level and they adapt their leverage level towards the targeted level over time.

The trade-off theory is targeted on the concept of companies have an "optimal" capital structure that assumes a targeted leverage and defines this leverage as a trade-off between tax and other profits against financial distress and other costs which are effects of the using debt.

The possibility of bankruptcy plays considerable role in what is commonly referred as the static trade-off theory of capital structure. This approach, which assumes that companies prefer their capital structure by trading off the advantages of debt financing opposed to the costs related with financial distress and bankruptcy risk, has been tested by regressing different leverage levels on

company characteristics which proxy for the tax advantage of debt and costs of bankruptcy.

2.3 Pecking Order Theory

Pecking Order Theory has been one of the most important theories of capital structure. Main suggestion of this theory is that companies prefer internally generated funds to external financing sources and external loan to equity when external financing is needed. The main alternative of the Pecking Order Theory is the static trade-off model under which companies determine external financing level by the trade-off between the costs and benefits of external financing.

Pecking order theory focused on explaining how contracts between equity holders and agents (executives) arrange variations in rewards to equity holders and executives. They theorized that equity holders provide stock buying options to executives in order to attract executives to act more like shareholders and take risks. The type of external financing used is the part of risk facing executives. The Pecking Order Theory may be considered in relation to the information asymmetric hypothesis. Companies' static trade off and pecking order preference of leverage both support to explain managerial behavior. In the asymmetric theory, executives have usually better and asymmetrical information about the value of the company, and this information has an impact on the change of a company's capital structure.

It has been demonstrated in the theory that a positive relation between profitability and corporate leverage when the market for corporate control

(mergers and acquisitions competition) is adequate and effective, and a negative relation if it is not effective. Further to that, it is not consistently true that profit-maximizing companies prefer to have high leverage tax shields.

Pecking Order Theory stated that companies will use debt only after exhausting the available internal funds. Profitability, as a measure by operating cash flow, reflects company's internal capability to fund new investments. This is not the only incomes reported in the profit loss statements but also the differences of net working capital over time. Operating cash flow represents the total available internally generated resources for funding potential new or replacement investment projects.

It is obvious from the related literature that Pecking Order managerial behavior in financing decision is somewhat partially clarified by the agency theory, asymmetry of information and cost of capital. It is also clear that a company's operational characteristics and business environment are critical factors of capital structure. However, the experimental support for the various theories of capital structure is varied.

2.4 Market Timing Theory

The earlier studies on Market Timing Theory of capital structure have mainly concentrated on the short term indications of timing on the issuing companies' capital structure. Majority of these studies checked only two or three year terms

after the Initial Public Offering (IPO) or the Seasoned Equity Offering (SEO). Even though Baker and Wurgler (2002) studied after raising equity, the more recent research that contradicts Baker and Wurgler's (2002) conclusion stop their studies after the second or the third year period. In their famous study, Baker and Wurgler (2002) found a correlation between equity market timing and capital structure of company, and they named their theory as "The market timing theory of capital structure". Baker and Wurgler (2002) propose that the timing of raising equity has permanent effects on issuing company's capital structure. They empirically indicate that low leverage companies are those which raised funds when their market values were comparatively high, as measured by the market-to-book ratio, while high leverage companies are those which raised funds when their market values were comparatively low. At that time, the market timing theory took its place as one of the major theories of capital structure along with the "Pecking Order Theory" and the "Tradeoff Theory". However, later recent studies could only partly support Baker and Wurgler's (2002) findings. These studies largely confirmed the correlation between cost of equity and timing of IPOs and SEOs. On the other hand, as opposed to Baker and Wurgler (2002), most of them proposed that, within two or three years, the effect of market timing on the issuing company's capital structure disappears. As one of the major criticism of Baker and Wurgler (2002), Alti (2006) checks for the long term impact of timing on capital structure using a new method, the "Hot" market measure. Firstly, he categorized the months as "Hot", "Neutral", or "Cold" based on the number of IPOs in each month. Then, he excluded the IPOs in "Neutral" months from his data sample. Lastly, he analyzed the leverage levels of the "Hot"

and "Cold" market issuers. His results demonstrate that "Hot" market companies (issuing companies in "Hot" months) tend to issue larger equity compared to "Cold" market companies (issuers in "Cold" months). He argues that, when the IPO market is "Hot", the overall market conditions are more favorable, accordingly, in order to decrease their cost of capital, more firms raise equity and each of them issue larger amount of equity during those periods. When he assessed for the impact of IPO market timing on issuing companies' capital structure, he found that, just two years after the IPO, the "Hot" market influence disappears (market timers do not have substantially lower leverage level compared to other companies). Alti (2006) argues that his findings support the more recent results of a short term impact of market timing on leverage level instead a constant impact.

2.5 Agency Cost Theory

Agency theory focused on the design of different governance structures to mitigate the agency conflicts arising from the potential diversity of interests between equity holders and executives (agents).

The segregation of ownership and management control in a competently managed company – one origin of agency conflicts – may result in executives applying poor work effort, taking care of perquisites, preferring inputs or outputs which enhance their own choices, or alternatively failing to maximize company's value. Actually, the agency costs of outside ownership equal the value lost from executives' enhancing their own utility, instead the value of the company.

Theory proposed that the preference of capital structure may assist mitigating the agency costs. Under the agency costs theory, high leverage ratio decreases the agency costs of outside equity and Increases Company's value by constraining or encouraging executives to behave more towards to the interests of equity holders. Higher financial leverage may have impact on executives' decision and decrease agency costs through the risk of liquidation, which causes personal loss to executives of salaries, fringe benefits, reputation etc., and through pressure to produce operational cash flow to pay interest charges. Higher financial leverage can reduce conflicts between equity holders and executives related to the choice of investment, the amount of risk to undertake, the circumstances under which the firm is liquidated (e.g., Harris and Raviv, 1991), and dividend payout policy.

Since increased financial leverage may decrease the agency costs of outside equity, the opposite effect may arise for the agency costs of outside debt occurring from conflicts between lenders and equity holders. If financial leverage reaches to relatively high level, further increases could create significant agency costs of outside debt from risk shifting or decreased effort to control risk which may end in higher expected costs of financial distress, liquidation or bankruptcy. These agency costs may result in larger interest expense amount for companies to compensate lenders for their expected losses. As indicated by Jensen and Meckling (1976), the impact of leverage on total agency costs is likely to be non-monotonic. At lower levels of leverage, increases may create positive incentives for executives and decrease total agency costs by reducing the agency costs of outside equity. However, at some point where liquidity and bankruptcy risk becomes more likely, the agency costs of external financing overwhelm the

agency costs of outside equity, so further increases in financial leverage may result in higher total agency costs.

2.6 Information Asymmetry

In Information Asymmetry theories, company executives or insiders are expected to have private information about the characteristics of the company's return flow or investment opportunities. In one group of approaches, preference of the company's capital structure gives a sign to external investors the information of insiders within company. In other words, capital structure is planned to decrease inefficiencies in the company's investment decisions which are caused by the information asymmetry. The various approaches in the following sub chapters have been analyzed.

a. Interaction between Capital Structure and Investment

Myers and Majluf (1984) showed in their study that, if investors have less information than what current company insiders have about the valuation of the company's assets, and then equity could be mispriced by the market. If companies are needed to fund their new investments by raising equity, underpricing may be so serious that new investors catch more than the NPV of the new investment project, ending with a net loss to existing equity holders. In this situation the new project will be denied even if NPV of the project is positive. This underinvestment could be avoided if the company can fund the new investment project using a protection which is not so seriously undervalued by the market. As an example, internal financial resources and riskless external financing do not

involve undervaluation, and, for that reason, will be preferred to equity by companies in this situation. Myers (1984) introduces this as "pecking order" theory of capital structure decisions, this capital structure will be directed by companies' aspiration to fund new investment projects, first with internally available resources, then with low-risk external debt, and lastly with equity only as a final resource.

b. Signaling with Leverage

In previous chapter, capital structure appeared as part of the solution to issues of over and under investment. The model will now be reviewed which investment is fixed and capital structure serves as a signal of private insider information. In this model, executives are aware of the true distribution of company's returns, but investors are not. Company return distributions are ordered by first order hypothetical dominance. Executives benefit when the company's securities are highly valued by the market however they are punished if the company goes bankruptcy. Investors accept higher debt levels as a signal of higher quality of company. Considering lower quality companies have higher marginal anticipated bankruptcy costs for any leverage level, executives of low quality companies do not act like higher quality companies by issuing more debt.

Part3

Impact of capital structure on profitability

3.1 Capital Structure and Profitability

In the capital structure literature, there are contradicting theories with regard to firms' capability in generating income and its impact on the leverage. The pecking order theory suggests a negative correlation between leverage and profitability due to firms with large amount of profits are able to commit investments depending on their internal reserves and accordingly external financing is not necessary. On the other hand, Jensen claimed that future outlook will impact the corporate behavior and considered that the more profitable firms have higher leverage. Hovakimian (2001) indicated that the firms with higher profitability over a long time prefer shareholder equity in favor of debt and use stock buybacks to distribute their profits. Furthermore, companies with large internal rate of return tend to use less external funds and reinvest their operating cash flows. As Frank & Goyal (2003) suggests, profitable corporations retain a high level of cash flows, and therefore they deal with lower financial risk. Unlike to the relation suggested by the pecking order theory, the trade-off theory indicates that more profitable firms may have better access to external funds, mainly if they have substantial fixed assets which could be used as collateral.

When other parameters like macroeconomic conditions, investors' behavior and financial market conditions are taken into account, the relation between profitability and financial leverage becomes indirect. This is the major reason for reaching different opinions. Shenoy&Koch (1996) highlighted that contradictory

hypothesis in the profitability and financial leverage relation occurs due to the pecking order theory considers a correlation between the profitability and leverage while the trade-off theory defines the dynamic condition of the variables.

3.2. Review of Previous Empirical Studies

There have been many empirical studies in different countries trying to understand the relation between capital structure and firms' performance and profitability. Below table summarizes some of the studies performed in different countries;

Author	Data Set	Result	Supporting Theory
Huang and M.Song, 2006	1.200 Chinese Companies (1994-2003)	Negative Correlation between Financial Leverage and Profitability	Pecking Order
Rajan and Zingales, 1995	Non-financial companies in G-7 Countries (1987-1991)	Negative Correlation between Financial Leverage and Profitability except Germany	Pecking Order
Bevan and Danbolt, 2002	822 Non-financial companies in UK (1988-1991)	Negative Correlation between Financial Leverage and Profitability	Pecking Order
Durukan,1997	68 Non-financial companies in Turkey (1990-1995)	Negative Correlation between Financial Leverage and Profitability	Pecking Order
Uzunlar,1998	500 Non-financial companies in Turkey (1992-1996)	Positive Correlation between Financial Leverage and Profitability (ROE)	Trade-Off Theory
Akhtar, 2005	Non-financial companies in Australia (1992-2001)	Positive Correlation between Financial Leverage and Profitability	Trade-Off Theory

3.3 Real Experience- An overview on how US CFOs look at capital structure decisions

John R.Graham and Campbell R.Harvey, 2 Academicans in US made a survey in 1999 with 392 CFOs of US based corporations about cost of capital, capital budgeting and capital structure subjects. The survey had questions about debt, equity, debt maturity, target financial leverage, credit ratings and actual financial leverage. One of the longstanding questions regarding capital structure is whether companies have targeted financial leverage. The trade-off theory assumes that companies have optimal debt to equity ratios, which they decide by trading off the advantages of external finance with the costs. In classic trade-off models, the main advantage of debt is the tax-shield advantage of interest expense deductibility. The main costs are those related with financial concern and the personal tax expense incur when they earn interest income. The classical elements in the trade-off theory, that is to say financial distress costs and tax costs and advantages will be discussed in this section. Several additional factors (asymmetry of information, agency costs etc.) can be designed in a trade-off framework. The CFOs in this survey stated that the corporate tax benefit of debt is important in capital structure decisions to some extent. The tax benefit is most important for the large, well regulated, and dividend-paying companies which possibly have high corporate income tax rates and accordingly high amount of tax incentives to use external financing. Companies raise foreign debt in response to related tax benefits, thus whether companies use debt when foreign tax treatment is encouraging was explored. It was found that favorable foreign tax treatment relative to the US is quite decisive. Big companies with large foreign

exposure are comparatively possible to suggest that foreign tax treatment is critical. This implies that companies require a certain degree of culture and exposure to execute international tax planning. In opposite, it was found limited sign that companies directly take into account personal taxation during capital structure decision making process. Accordingly, it is not likely that companies target investors in certain tax clients (even though the probability that investors prefer to invest in companies depending on dividend payout policy, or that executives react to personal tax treatments to the extent that they are reflected in the prices cannot be totally dismissed, see Graham,1999a). When firms are being asked directly about if possible costs of financial distress has any impact on their capital structure decisions, it was found that they are not so crucial, even though they are comparatively critical amongst speculative-grade companies. On the other hand, companies are very cautious about their credit ratings that can be considered as a signal of concern about financial distress. Among companies which have rated debt, credit ratings are a crucial element of capital structure policy. Credit ratings are also essential for large corporations which are in Fortune 500. Lastly, as an important observation from survey results, CFOs are also worried about volatility of earnings while deciding on capital structure, which is coherent with the trade-off theory's indication that companies lower debt level when the possibility of liquidation and bankruptcy is high (Castanias,1983). It was also asked in the survey that if companies have an optimal or `targeted financial leverage. 19% of the companies do not have a target financial leverage level. Another 37% indicated that they have a flexible target range, and other 34% have a leverage target range to some extent. The remaining 10% stated that

they have a rigid target leverage level. All these figures present varied support for the concept that company's trade off costs and advantages to determine an optimal financial leverage. On the other hand, analysis indicates that larger companies are more likely to have target financial leverage: 55% of big scaled companies have at least partially strict target range comparing to 36% of small scaled companies. Targets which are strict or partially strict are more ordinary amongst investment-grade (64%) than speculative companies (41%) and amongst regulated (67%) than unregulated companies (43%). Other observation from survey that targets are crucial if the CEO of company has short term or is young, and when the top three equity holders have less than 5% of the company. As a result, the CFOs in this survey reports that their companies raise equity to maintain target leverage, particularly if their company's financial leverage is high, firm partnership is widely dispersed, or the CEO is young. The survey proof presents limited support for the trade-off theory.

Part 4

Empirical Study

4.1 Hypothesis

As explained in the previous sections capital structure decision is associated with various factors and all the theories related to capital structure try to explain the relationship between leverage and firm's size, profitability, stock performance, cost of capital, growth etc. This empirical study will focus specifically on the relationship between firm's return performance and the level of leverage. ROCE (Return on capital employed) has been selected as it reflects the return performance of firm's equity and long term debt and in total so called capital employed. "Long Term Debt to Equity" ratio has been selected as leverage ratio to exclude short term debt as it may be used mainly to finance working capital deficit hence may not reflect company's strategy on the capital structure.

It is expected to have significant relation between ROCE and leverage; however it is not so easy to predict the way of the relationship whether positively or negatively. In our model, we took the approach from pecking order theory, which is profitable firms may have substantial accumulated internal fund therefore these firms will first utilize their internal funds before approaching external depts. If the result of empirical study between ROCE and leverage is significant and negative then this will confirm pecking order theory.

In our empirical study we also considered that leverage may have impact on ROCE variable with some time deferral so we will apply the study both on ROCE (t+1) and ROCE (t+2) values while all other variables remain at (t+0).

4.2 Data Set

We used sample of publicly listed Turkish firms' public quarterly data for the period from 2011 to 2015 to test our hypothesis. We have selected 65 companies out of top 100 (BIST 100) company as per below selection criteria to reach a sample which presents real industry and trade;

- Banking and insurance industry companies excluded
- Football Clubs are excluded
- Real Estate Investment Trusts are excluded
- 16 companies excluded which data is not available for all the periods.

List of firms are as shown in the appendix-1.

Financial Statements of the sample has been extracted from KAP (Public Information Site of Istanbul Stock Exchange) and stock volatility data has been gathered from Bloomberg.

In order to eliminate outlier values all the series have been winsorized on 1% basis and lowest and highest 1% values are set to the next largest/lowest values.

4.3 Variables

Definitions, formulas and symbols of variables used in the study are summarized in the below table followed by more detailed explanations;

Table 1: Definition, Formula and Symbols of Variables

Definition of Variable	Formula	Symbol
Return on Capital Employed	Earnings Before Interest/(Total Assets -Current Liabilities)	ROCE
Earnings Before Interest Tax Depreciation and Amortization Margin	(Earnings Before Interest Tax Depreciation and Amortization Margin)/Total Revenue	EBITDA MARGIN
Current Ratio	Current Assets/Current Liabilities	CURRENT RATIO
Long Term Debt to Equity	Long Term Debt/Equity	LEVERAGE
Stock Price Volatility	Actual Stock Price Volatility (Bloomberg)	VOLATILITY

4.3.1 Return on Capital Employed

The return on capital employed quantifies the ratio of adjusted earnings to the amount of equity and debt required for a firm to function. It is crucial for a firm to stay in business over the long period, its return on capital employed ratio has to be larger than its weighted average cost of capital; otherwise ongoing operations constantly decrease the earnings available to equity holders. It is generally used to compare the effectiveness of capital utilization of firms within the same business sectors.

The return on capital employed is a preferable analysis tool than return on equity, because return on capital employed indicates how well a firm is utilizing both its equity and debt to create a return.

The ROCE Formula is;

ROCE= (Earnings before interest and taxes) / (Total Assets- Current Liabilities)

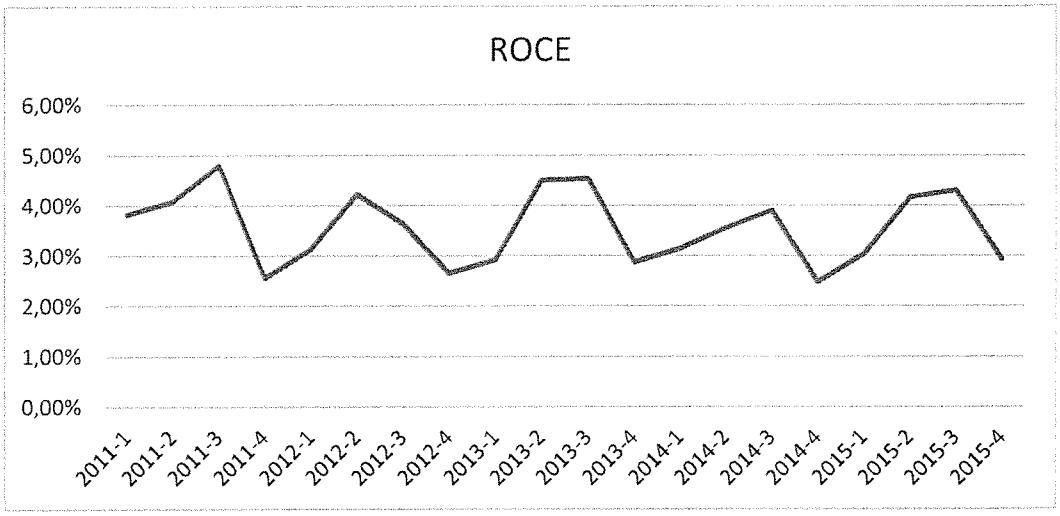
Below table and graph shows the average ROCE level of the sample firms over the quarterly periods;

Table2: Average quarterly ROCE values of sample

PERIOD (QUARTER)	ROCE
2011-1	3.82%
2011-2	4.08%
2011-3	4.79%
2011-4	2.56%
2012-1	3.13%
2012-2	4.22%
2012-3	3.64%
2012-4	2.65%
2013-1	2.92%
2013-2	4.50%
2013-3	4.53%
2013-4	2.87%
2014-1	3.14%
2014-2	3.55%
2014-3	3.90%
2014-4	2.48%
2015-1	3.03%
2015-2	4.17%
2015-3	4.30%
2015-4	2.94%
AVERAGE	**3.56%**

Source: Computed results based on collected data from KAP

Graph 1: Average quarterly ROCE values of sample



Source: Computed results based on collected data from KAP

4.3.2 EBITDA Margin

The EBITDA margin turns the simple profitability formula into a financial measure which can be used to analyze various scaled firms within the particular industry. The EBITDA margin formula divides the basic earnings before interest, taxes, depreciation and amortization by the total net sales of the firm-- therefore, measuring the incomes left over after all operating expenses (excluding interest, taxes, depreciation and amortization) are paid as a percentage of total turnover.

Formula;

$$\text{EBITDA Margin} = \frac{\text{Earnings Before Interest Tax Depreciation and Amortization}}{\text{TotalRevenue}}$$

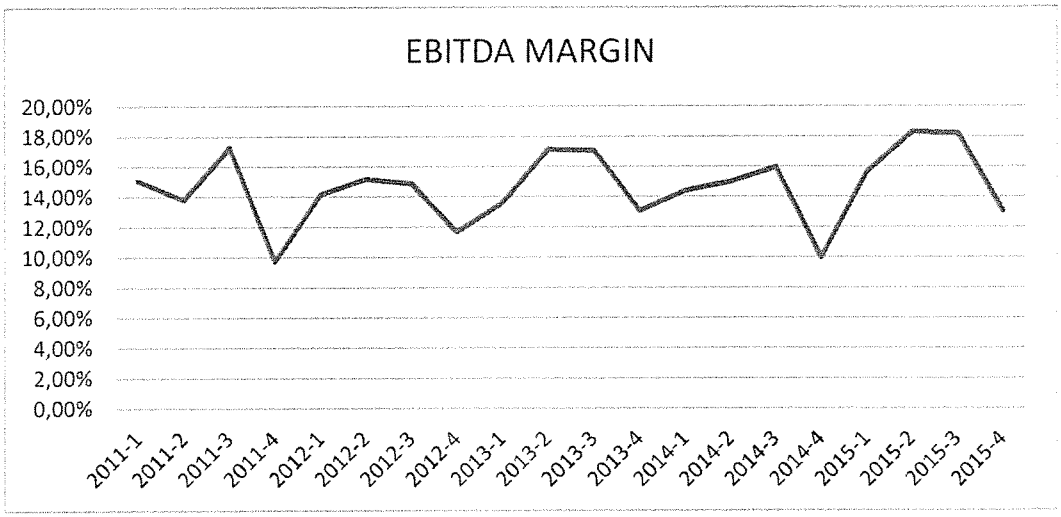
Below table and graph shows the average EBITDA Margin level of the sample firms over the quarterly periods;

Table3: Average quarterly EBITDA Margin values of sample

PERIOD (QUARTER)	EBITDA MARGIN
2011-1	15.10%
2011-2	13.82%
2011-3	17.28%
2011-4	9.72%
2012-1	14.16%
2012-2	15.18%
2012-3	14.88%
2012-4	11.66%
2013-1	13.60%
2013-2	17.14%
2013-3	17.07%
2013-4	13.08%
2014-1	14.41%
2014-2	15.01%
2014-3	15.97%
2014-4	9.98%
2015-1	15.65%
2015-2	18.31%
2015-3	18.21%
2015-4	13.08%
AVERAGE	**14.67%**

Source: Computed results based on collected data from KAP

Graph 2: Average quarterly EBITDA Margin values of sample



Source: Computed results based on collected data from KAP

4.3.3. Current Ratio

The current ratio is a liquidity and efficiency ratio that calculates a company's capability to pay its short term liabilities with its current assets. The current ratio is a substantial measure of liquidity as short-term liabilities are due within one year period.

This indicates that a firm has a short amount of time in order to raise the financing to pay off for these liabilities. Current assets like cash and cash equivalents, and other assets which can easily be converted into cash in the short time period. This implies that firms with high amounts of current assets can easily pay off current liabilities when they become due without selling off long-term assets.

Formula;

Current Ratio= Current Assets/Current Liabilities

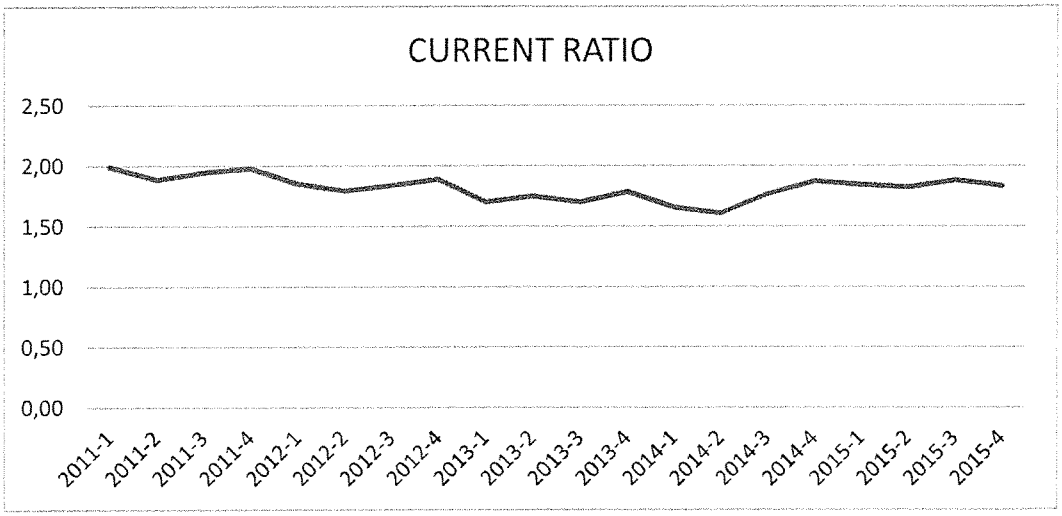
Below table and graph shows the average Current Ratio level of the sample firms over the quarterly periods;

Table4: Average quarterly Current Ratio values of sample

PERIOD (QUARTER)	CURRENT RATIO
2011-1	1.99
2011-2	1.89
2011-3	1.95
2011-4	1.98
2012-1	1.85
2012-2	1.79
2012-3	1.84
2012-4	1.89
2013-1	1.70
2013-2	1.75
2013-3	1.70
2013-4	1.78
2014-1	1.65
2014-2	1.61
2014-3	1.77
2014-4	1.87
2015-1	1.84
2015-2	1.82
2015-3	1.88
2015-4	1.83
AVERAGE	**1.82**

Source: Computed results based on collected data from KAP

Graph3: Average quarterly Current Ratio values of sample



Source: Computed results based on collected data from KAP

4.3.4 Long Term Debt to Equity (Leverage)

The long term debt to equity ratio is measured by taking the firm's long-term debt and dividing it by the value of shareholders' equity. The greater a firm's leverage, the higher the long term debt to equity ratio. Generally, firms with higher ratios are considered to be more risky.

Formula;

Leverage= Long Term Debt / Equity

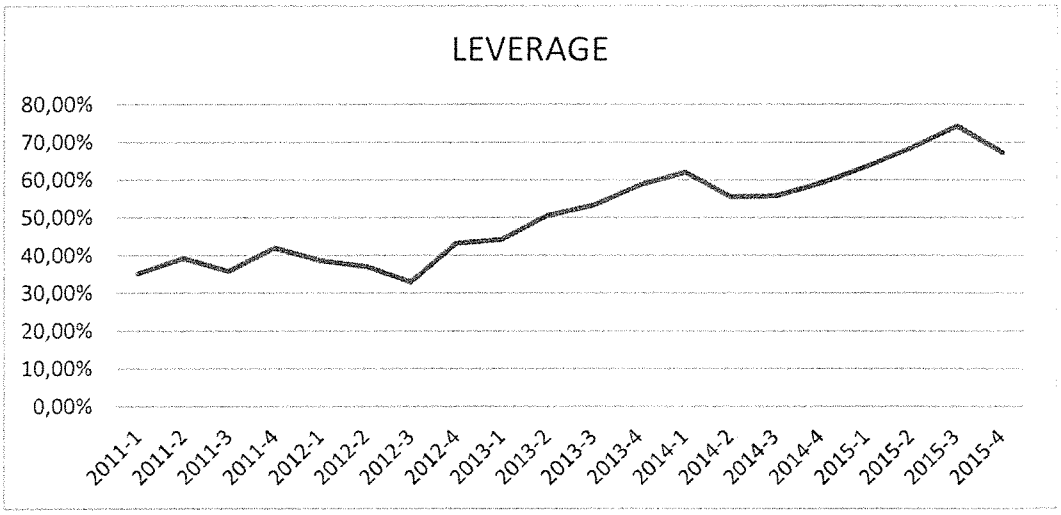
Below table and graph shows the average leverage level of the sample firms over the quarterly periods;

Table5: Average quarterly leverage values of sample

PERIOD (QUARTER)	LEVERAGE
2011-1	35.14%
2011-2	39.19%
2011-3	35.79%
2011-4	42.02%
2012-1	38.57%
2012-2	37.07%
2012-3	32.91%
2012-4	43.19%
2013-1	44.20%
2013-2	50.61%
2013-3	53.32%
2013-4	58.57%
2014-1	62.07%
2014-2	55.55%
2014-3	55.74%
2014-4	59.14%
2015-1	63.59%
2015-2	68.51%
2015-3	74.27%
2015-4	67.24%
AVERAGE	**50.83%**

Source: Computed results based on collected data from KAP

Graph 4: Average quarterly leverage values of sample



Source: Computed results based on collected data from KAP

4.3.5 Stock Price Volatility

Stock price volatility is a sign which is used by options traders to analyze fluctuations in the market. There are two major types of stock volatility which are historical stock price volatility and implied stock price volatility. The incline or decline of stock volatility results from changes in investors' behaviors in the market. More clearly greed and fear in the market are the two essential elements which cause stock prices to fluctuate. Stock price volatility tends to increase when there is newly released information in the markets.

Historical volatility, generally referred to as actual volatility and realized volatility, is the measure of a stock price change based on historical prices (stock price history) and it is considered to measure how active a stock price typically is over time. It calculates the fluctuations in the stock price, and more explicitly it is

calculated by taking the daily percentage price changes in a stock and calculating the average over a specific time period.

Implied volatility is the current volatility of a stock and is predicted by its option price. Particularly, the implied stock price volatility is the level of volatility that will measure a fair value of stock which equals to the current trading option price.

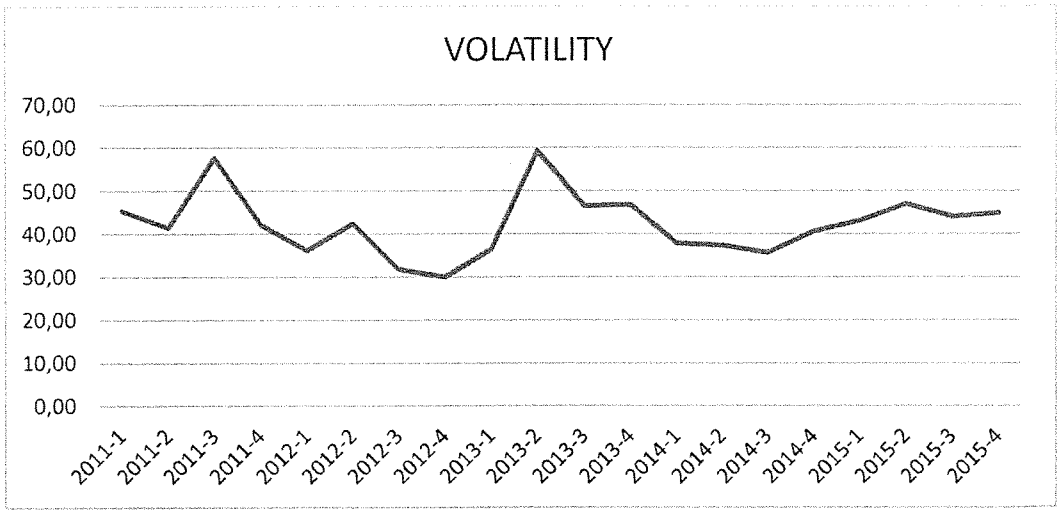
In this study historical stock price volatility has been obtained from Bloomberg and below table and graph shows the average volatility level of the sample firms over the quarterly periods;

Table6: Average quarterly stock volatility values of sample

PERIOD (QUARTER)	VOLATILITY
2011-1	45.41
2011-2	41.46
2011-3	57.64
2011-4	42.21
2012-1	36.17
2012-2	42.39
2012-3	31.83
2012-4	29.98
2013-1	36.45
2013-2	59.31
2013-3	46.47
2013-4	46.83
2014-1	37.78
2014-2	37.37
2014-3	35.64
2014-4	40.65
2015-1	43.14
2015-2	46.96
2015-3	44.02
2015-4	44.88
AVERAGE	**42.33**

Source: Bloomberg Historical Stock Price Volatility

Graph 5: Average quarterly stock volatility values of sample



Source: Bloomberg Historical Stock Price Volatility

4.4 Method

In this study "Panel Data Analysis" method has been used. Panel data analysis represents a combination of regression and time series analysis. As with many regression data sets, panel data are composed of a cross-section of subjects. Unlike regression data, with panel data subjects over time can be observed. Unlike time series data, with panel data many subjects can be observed. Observing a broad cross-section of subjects over time allows us to study dynamic, as well as cross-sectional, aspects of a problem.

In our study, Hausman test has been used in all 3 models in order to determine whether fixed or random effects should be applied.

Descriptive statistics of variables are presented in the below table.

Table 7: Descriptive Statistics of Variables

	ROCE	EBITDA	CURRENT RATIO	LEVERAGE	VOLATILITY
Mean	0.035613	0.146653	1.820004	0.508338	42.33004
Median	0.028523	0.123811	1.508826	0.205167	38.45300
Maximum	0.180422	0.658329	7.484149	4.417062	96.25800
Minimum	-0.059539	-0.301477	0.357042	0.000000	19.43800
Std. Dev.	0.041836	0.149444	1.216491	0.791633	15.55511
Skewness	1.031517	0.619089	2.371082	2.758955	1.233169
Kurtosis	4.863971	5.223956	10.08833	11.59083	4.499037
Jarque-Bera	418.7352	350.9492	3939.678	5646.858	451.2045
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	46.29631	190.6484	2366.005	660.8388	55029.05
Sum Sq. Dev.	2.273567	29.01133	1922.326	814.0617	314308.0
Observations	1300	1300	1300	1300	1300
Cross sections	65	65	65	65	65

Source: Computed results based on collected data from KAP Stat.Tool: E-Views

Table 8: Correlation Matrix of Variables

VARIABLES	ROCE	EBITDA MARGIN	CURRENT RATIO	LEVERAGE	VOLATILITY
ROCE	1.00				
EBITDA MARGIN	0.42	1.00			
CURRENT RATIO	-0.02	0.20	1.00		
LEVERAGE	-0.15	0.03	-0.32	1.00	
VOLATILITY	0.05	0.01	0.10	0.01	1.00

Source: Computed results based on collected data from KAP Stat.Tool: E-Views

As presented above weak positive correlation between ROCE and EBITDA as well as weak negative correlation between leverage and current ratio have been observed from our variables.

4.5 Findings

In this section, empirical results for the 3 models will be presented. First model will explore the relation between ROCE as independent variable with other dependent variables namely EBITDA Margin, Current Ratio, Leverage and Stock Price Volatility. In our second model, independent variable ROCE will be 1 quarter deferred while all other dependent variables remain at same and in our last (third) model ROCE will be deferred 2 quarter while all other remain at same.

4.5.1 Model 1- ROCE (t0)

Table 9: Empirical Findings for Model 1 (Dependent Variable: Roce t0)

Independent Variables	Coeeficient	Std. Error	T Value	P Value
EBITDA*	0.206485	0.006704	30.80127	0
CURRENT RATIO	0.000346	0.001017	0.340212	0.7338
LEVERAGE*	-0.009043	0.001653	-5.470013	0
VOLATILITY	0.000014	0.000048	0.291868	0.7704
Period	0.000014	0.000048	0.291868	0.7704
Cross Sections	65			
Total Panel (Balanced) Observations	1300			
R-Squared	0.680885			
F Statistics	38.62572			
Prob. (F Statistics)	0			
Hausmann Test Chi-Sq. Statistic/Prob	32.836892/0			

Source: Computed results based on collected data from KAP Stat.Tool: E-Views
*Significant at 5% level

As presented above, Hausman Test Probability Value is less than 0.05 which means that fixed effects model should be used. R-squared value in the model, 0.680885, indicates that variability in ROCE can be explained by the other independent variables namely Ebitda, Current Ratio, Leverage and Volatility. Ebitda and Leverage have P values which are less than 0.05, this indicates that ROCE has statistically significant positive correlation with Ebitda and significant negative correlation with Leverage at 5% level.

4.5.2 Model 2- ROCE (t+1)

Table 10: Empirical Findings for Model 2 (Dependent Variable: Roce t+1)

Independent Variables	Coeeficient	Std. Error	T Value	P Value
ROCE (T+0)*	0.130875	0.039778	3.290138	0.001
EBITDA	0.001925	0.012529	0.153626	0.8779
CURRENT RATIO	0.001205	0.001404	0.858495	0.3908
LEVERAGE*	-0.00568	0.002344	-2.422794	0.0156
VOLATILITY	0.000024	0.0000649	0.370356	0.7112
Period	19			
Cross Sections	65			
Total Panel (Balanced) Observations	1235			
R-Squared	0.438317			
F Statistics	13.1757			
Prob. (F Statistics)	0			
Hausmann Test Chi-Sq. Statistic/Prob	339.577478/0			

Source: Computed results based on collected data from KAP Stat.Tool: E-Views
*Significant at 5% level

As presented above, Hausman Test Probability Value is less than 0.05 which means that fixed effects model should be used. R-squared value in the model, 0.438317, indicates that variability in ROCE (t+1) can be explained by the other independent variables namely Roce (t+0), Ebitda, Current Ratio, Leverage and Volatility. Roce (t+0) and Leverage have P values which are less than 0.05, this indicates that ROCE (t+1) has statistically significant positive correlation with ROCE (T+0) and significant negative correlation with Leverage at 5% level.

4.5.3 Model 3- ROCE (t+2)

Table 11: Empirical Findings for Model 3 (Dependent Variable: Roce t+2)

Independent Variables	Coeeficient	Std. Error	T Value	P Value
ROCE (T+1)*	0.115893	0.03047	3.80358	0.0002
ROCE (T+0)	-0.018075	0.040951	-0.441374	0.659
EBITDA	-0.022466	0.012935	-1.736826	0.0827
CURRENT RATIO*	0.003641	0.001503	2.421867	0.0156
LEVERAGE	-0.002991	0.002544	-1.175919	0.2399
VOLATILITY	-0.0000489	0.0000657	-0.743378	0.4574
Period	18			
Cross Sections	65			
Total Panel (Balanced) Observations	1170			
R-Squared	0.440167			
F Statistics	12.34408			
Prob. (F Statistics)	0			
Hausmann Test Chi-Sq. Statistic/Prob	301.496036/0			

Source: Computed results based on collected data from KAP Stat.Tool: E-Views
*Significant at 5% level

As presented above, Hausman Test Probability Value is less than 0.05 which means that fixed effects model should be used. R-squared value in the model, 0.440167, indicates that variability in ROCE (t+2) can be explained by the other independent variables namely Roce(t+1), Roce (t+0), Ebitda, Current Ratio, Leverage and Volatility. Roce (t+1) and Current Ratio have P values which are less than 0.05, this indicates that ROCE (t+2) has statistically significant positive correlation with ROCE (T+1) and Current Ratio at 5% level.

4.6 Results of Study

In our empirical study relationship between leverage and company's return performance have been tested in 3 different models.

Model 1: Significant negative correlation found between ROCE and leverage

Model 2: Significant negative correlation found between ROCE (t+1) and leverage

Model 3: No any correlation found between ROCE (t+2) and leverage

4.7 Conclusion

From Modigliani-Miller's irrelevance proposition in 1963, there have been many academic research and discussions on capital structure decisions of a firm. Capital structure decision is one of the most critical components of corporate finance decisions as it maintains the firms' sustainable growth and profitability objectives by achieving the optimal funding strategy.

The objective of this study is to investigate the relationship between capital structure decisions and company's return performance using a large sample of Turkish firms listed in Istanbul Stock Exchange (BIST). In this study panel data analysis has been used to determine relationship between Return on Capital Employed as dependent variable and "long term debt to equity" ratio as independent variable as well as other control variables EBITDA Margin, Current Ratio and Stock Price Volatility. Study has been iterated by using deferred ROCE variable on (t+1) and (t+2) periods. Significant negative correlation found between return and leverage on t and t+1 period but on t+2 period significant correlations could not be observed. These results are in line with the pecking

order theory as high profit performance companies have comparatively higher internal funds so they tend to use their internal funds before external debt.

It can be observed from the data set and the results of this study, Turkish companies which prefer internally generated sources and equity funding rather than external financing can generate higher return on their employed capital. There can be several local arguments to support these findings such as poor financial market conditions, barriers to access external funds, high cost of debt, high volatility of the market etc. One of the major facts in Turkish debt market is that, borrowing in local currency is only possible for the short term maturity and when the firm wants to raise long term debt it has to be in foreign currencies. As foreign currency loan increases the foreign currency risk this will be discouraging factor for the firms which prefer to raise long term debt. Under these circumstances, capital structure decisions in Turkish companies are generally being determined by external market conditions and limitations rather than companies' own decisions and as the market conditions improve more companies will be encouraged to raise long term loan.

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APPENDIX-1: List of Firms used in data sample

1	ADEL KALEMCİLİK TİC. VE SAN.A.Ş.
2	AFYON ÇİMENTO SAN. TÜRK A.Ş.
3	AKENERJİ ELEKTRİK ÜRETİM A.Ş.
4	AKSA AKRİLİK KİMYA SAN. A.Ş.
5	AKSA ENERJİ ÜRETİM A.Ş.
6	ALARKO HOLDİNG A.Ş.
7	ALCATEL LUCENT TELETAŞ TELEKOMUNİKASYON A.Ş.
8	ALKİM ALKALİ KİMYA A.Ş.
9	ANADOLU CAM SANAYİ A.Ş.
10	ANADOLU EFES BİRACILIK VE MALT SANAYİ A.Ş.
11	ARÇELİK A.Ş.
12	ASELSAN ELEKTRONİK SAN. VE TİC. A.Ş.
13	AYEN ENERJİ A.Ş.
14	AYGAZ A.Ş.
15	BAĞFAŞ BANDIRMA GÜBRE FABRİKALARI A.Ş.
16	BİM BİRLEŞİK MAĞAZALAR A.Ş.
17	BİZİM TOPTAN SATIŞ MAĞAZALARI A.Ş.
18	BORUSAN MANNESMANN BORU SAN VE TİC A.Ş.
19	BRISA BRIDGESTONE SABANCI LASTİK SAN VE TİC A.Ş.
20	COCA COLA İÇECEK A.Ş.
21	ÇELEBİ HAVA SERVİSİ A.Ş.
22	DEVA HOLDİNG A.Ş.
23	DOĞAN ŞİRKETLER GRUBU HOLDİNG A.Ş.
24	DOĞUŞ OTOMOTİV SERVİS VE TİCARET A.Ş.
25	EGE ENDÜSTRİ VE TİCARET A.Ş.
26	EİS ECZACIBAŞI İLAÇ SİNAİ VE FİNANSAL YATIRIMLAR A.Ş.
27	ENKA İNŞAAT VE SANAYİ A.Ş.
28	EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.
29	FORD OTOMOTİV SANAYİ A.Ş.
30	GOOD YEAR LASTİKLERİ T.A.Ş.
31	GÖLTAŞ GÖLLER BÖLGESİ ÇİMENTO A.Ş.
32	GÜBRE FABRİKALARI T.A.Ş.
33	HACI ÖMER SABANCI HOLDİNG A.Ş.
34	İHLAS HOLDİNG A.Ş.
35	İZMİR DEMİR ÇELİK SANAYİ A.Ş.
36	KARDEMİR KARABÜK DEMİR ÇELİK SAN. TİC. A.Ş.
37	KARSAN OTOMOTİV SAN VE TİC A.Ş.
38	KARTONSAN KARTON SAN. VE TİC.A.Ş
39	KOÇ HOLDİNG A.Ş.
40	KONYA ÇİMENTO SAN. A.Ş.
41	LOGO YAZILIM SAN. VE TİC. A.Ş.

42	MİGROS T.A.Ş.
43	NET TURİZM SAN VE TİC .AŞ.
44	NORTEL NETWORKS NETAŞ TELEKOMUNİKASYON A.Ş
45	OTOKAR OTOMOTİV VE SAVUNMA SAN A.Ş.
46	PARK ELEKTRİK ÜRETİM MADENCİLİK SAN VE TİC A.Ş.
47	PARSAN MAKİNA PARÇALARI SAN A.Ş.
48	PETKİM PETROKİMYA HOLDİNG A.Ş.
49	SODA SANAYİ A.Ş.
50	TAT GIDA SANAYİ A.Ş.
51	TAV HAVALİMANLARI HOLDİNG A.Ş.
52	TEKFEN HOLDİNG A.Ş.
53	TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.
54	TRAKYA CAM SANAYİ A.Ş.
55	TURKCELL İLETİŞİM HİZMETLERİ A.Ş.
56	TÜRK HAVA YOLLARI A.O.
57	TÜRK TELEKOMUNİKASYON A.Ş.
58	TÜRK TRAKTÖR VE ZİRAAT MAKİNELERİ A.Ş.
59	TÜRKİYE PETROL RAFİNERİLERİ A.Ş.
60	TÜRKİYE ŞİŞE VE CAM FABRİKALARI A.Ş.
61	ÜLKER BİSKÜVİ SANAYİ A.Ş.
62	VESTEL BEYAZ EŞYA SAN VE TİC A.Ş.
63	VESTEL ELEKTRONİK SANAYİ VE TİC. A.Ş
64	YAZICILAR HOLDİNG A.Ş
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