

Determinants of Capital Structure in Turkey and USA

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ABSTRACT

This thesis focused on effects of global financial recession on the capital structure of firms in two different countries. Variables chosen for the study are according to Sheikh & Wang (2011) which are tangibility, size, profitability, non-debt tax shield, growth and liquidity. Furthermore, the study three different ratios as total debt ratio, total long term ratio and short term debt ratio. The period chosen for the study includes the years from 2000 to 2012 which includes the global financial crisis. All the variables are taken in to a panel structure to see whether they could determine the changes in the dependent variables. In addition, correlation analysis is implemented in Eviews to test the Multicollinearity. Heteroskedasticity and autocorrelation are tested for regression. Regression results are divided according to the sub periods of 2000 to 2007 and 2008 to 2012. Result show that determinates of capital structure differ from Turkey to USA. Furthermore, the results also change based on the periods. For the whole period, tangibility and profitability are calculated to cause changes in total debt for the case of Turkey. On the other hand, Profitability, liquidity and size are reported to cause changes in total debt in USA. Especially, liquidity is found to be very significant for short term debt during and after the crisis for both economies.

Keywords: Capital Structure, Financial Crisis, Developed Markets, Emerging Markets

ÖZ

Bu tez, küresel finansal krizin iki farklı ülkedeki şirketlerin sermaye yapıları üzerindeki etkilerini inceler. Çalışmada kullanılan değişkenler, Wang (2011)'in çalışmasında kullanmış olduğu somutluk, aktif büyüklüğü, karlılık, borç dışı vergi dilimi, büyüme ve likiditedir. Bunun yanında, çalışmada toplam borç rasyosu, uzun dönemli borç rasyosu ve kısa dönemli borç rasyoları hesaplanmıştır. Çalışma, küresel finansal krizinde dahil olduğu 2000 ile 2012 yıllarını kapsamaktadır. Bütün değişkenler, bağımlı değişkenler üzerinde etkisinin olup olmadığını belirleyebilmek için panel veri şeklinde yapılandırılmıştır. Bunun yanında, çoklu eşdoğrusallığı test edebilmek için SPSS programında ilgileşim düzeyi ve VIF testleri uygulanmıştır. Çokdeğişirlik ve kendiyile ilgileşim de bağlaşım modeliyle test edilmiştir. Bağlaşım modeli sonuçları, 2000-2007 ile 2008-2012 yılları arasında farklılık göstermektedir. Sonuçlar, sermaye yapısını belirleyen değişkenlerin, Türkiye ve Amerika'da farklı olduğunu ortaya çıkarmıştır. Toplam çalışma periyodu içerisinde, Türkiye'de somutluluk ve karlılık değişkenlerinin toplam borcu etkilediği gözlemlenmiştir. Bunun yanında, karlılık, likidite ve aktif büyüklüğünün Amerika'daki toplam borcu etkilediği gözlemlenmiştir. Özellikle likidite değişkeninin finansal kriz dönemi ve sonrasında, her iki ülke ekonomisinde de kısa vadeli borçlar üzerinde anlamlı olduğu ortaya çıkmıştır.

Anahtar Kelimeler: Sermaye Yapısı, Finansal Kriz, gelişmiş piyasalar, Gelişmekte Olan Piyasalar

To My Parents

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Chapter 1

INTRODUCTION

The very first theory on capital structure is introduced for the first time by Modigliani and Miller in 1958 (Harris et al, 1991). The basis of the theory caused the researchers to focus on the capital structure of firms since then. Since it is said that the theory is not accurate enough (Harris et al, 1991) other theories are introduced to find the optimal capital structure of firms. Another theory on capital structure was introduced by Modigliani & Miller (1963) which defined the structure differently which was called trade-off theory. In their study they explain that, the optimal capital structure of a firm is achieved through the mixture of debt and equity. Almost a decade later, another study by (Jensen et al, 1976) developed another theory which is called agency cost theory. The other theory which is more popular is called pecking order theory which is the result of the work of Myers & Majluf (1984). If the assumption is that the correlation exists between leverage and the performance of financial terms, the best choices which could determine the determinants of leverage are trade off and agency cost theories. It is clear that the ownership and management of firms are sometimes separated and that when the firm is likely to face agency problem and those conflicts of interests between managers and shareholders. There have been many reasons identified which cause the problem to arise. Lack of knowledge, lack of effort and preferring their own interests rather than the shareholders are those reasons arise from managers which causes the agency

problems. There have been many different tolls identified to overcome the issue. One solution is to control managers and monitor them. However, it is not always possible to do that. Moreover sometimes it is too late to react upon the actions made by managers. Hence the best solution is to share the ownership with managers. In this case the sole of managers would be maximizing the shareholders wealth. On the other hand as it is explained by pecking order theory, managers prefer to enhance the cheapest source of financing (Myers & Majlof, 1984). Pecking order theory states that, due to possible problems caused from asymmetry information, managers tend to prefer internal financing rather than external financing hence preferring equity rather than debt (Myers, 2001). There are two assumptions which the theorem is based on them. 1) Managers know the internal condition of the firm better than external investors 2) Manager's actions are devoted entirely to maximize the firms' profitability. So the most significant difference between pecking order and trade-off is that, the first one focuses on information asymmetric and the second one takes taxes into consideration. The current study investigates if there is any correlation exists between leverage and other financial ratios in firms in BORSA Istanbul and S&P 500, and to realize if either debt or equity is playing the main role in capital structure of these firms. Afterward there will be a comparison between the capital structure determinants between these two indices. There are many studies done on the matter. Welch (2004), investigated that how leverage is effected from stock returns. There are other studies which have investigated the effect of share prices on leverage such as (Baxter & Cragg, 1970).

1.1 Aim of Study

This study has chosen BURSA 100 index and S&P 500 since according to the information provided by the stock exchanges which these firms are part of, the market capitalization of them are the highest in their regions. It also has to be mentioned that, interestingly the results of previous studies on capital structure of firms are somehow in contrast with each other which show that there is still more investigation needs to be done. The study has chosen 5 important sectors in both indices and for each sector 4 different firms based on their market capitalization are chosen. The period chosen for the study is 12 years from 2000 to 2012. The data is extracted from the financial statements of the firms based on annual report. Another factor which this study considers is the global financial crisis. Hence the period is divided in to two sub periods from 2000 to 2007 (before crisis) and from 2008 to 2012 (during and after crisis). Other studies such as Crotty, J. (2009) have already focused on the financial crisis but no studies have ever compared two different countries from emerging and developed markets.

1.2 Variables Chosen for the Study

There are many different variables used to capture the effect of them on leverage such as, age, market to book ratio. However this study uses the variables according to Brav (2009). The variables are divided in to two groups of dependent and independent variables. The independent variables which are supposed to cause changes in leverage are, Tangibility, liquidity, non-debt tax shield, size, growth and profitability. The dependent variables are Total debt ratio, Short term debt ratio and long term debt ratio. These variables are more discussed in the next chapter.

1.3 Methodology of the Research

The methodology used is according to Brav (2009) and Sheikh & Wang (2011). He used a multi-variable linear equation to evaluate the relation between control and dependent variables. The model is also according pecking order theory of non-financial firms. Panel data least squares regression model with fixed cross section effect is implemented to observe the correlation and relation between the different determinants of capital structure. Since the study is investigating two sub periods, different approaches such as descriptive analysis, correlation matrix and regressions are conducted to compare the results before and after crisis.

1.4 Structure of the Study

The study includes different sections: In section II, previous studies on the same matter are described. Section III, introduces the firms and the index used for the study. In chapter IV, the hypothesis is developed according to empirical evidences, data and methodology are followed by explanations. Chapter V outlines empirical results are discussed. Chapter VI bring conclusions limitations of the study and offer new silver lines for the future researches.

Chapter 2

LITERATURE REVIEW

One of the theories which caused a significant change in finance is the theory introduced by Modigliani & Miller (1958). A number of other theories are introduced in order to find a better solution than Modigliani & Miller's. Most of these theories discuss the need for a new approach to estimate the optimized capital structure since they believe the approach suggested by Modigliani and Miller is not accurate enough and could not result in the best formation of capital structure. This chapter provides most theories which have been introduced during the past decades.

Interestingly, a single theory which could describe the determinants of leverage has not been introduced yet, however, there are theories which could be useful under certain circumstances. The fact that there has not been a single theory to describe the optimal capital structure goes mainly back to firms themselves. Different firms in different industries have different ownerships and those who are involved with ownership in a firm usually define the source of financing. It also could be said that each firm has a unique attribute and that might be the reason why there has not a single theory defined which could work for all firms (Schwartz, 1959). The current study focuses on to most important theories on capital structure such as Trade off theory, agency cost model, pecking order and Modigliani and Miller.

2.1 Modigliani and Miller Theory

One of the first and most criticized theories of capital structure is this theory. There have been many papers on criticizing the basics of the theory and how the theory is not able to explain the optimal capital structure in firms. Although there have been many studies in contrast to Modigliani and Millers, the common belief is that the theory was able to open new doors on how firms think of their source of financing (Berry, 2006). The theory describes that when the market is flawless and there is no cost of business and in absence of tax, when firms borrow all the outsiders are likely to share an equal level of risk and profit or loss will happen in a constant pace. It is clear that in such condition, there will not be any cost for information and managers will focus to maximize the shareholders' wealth. According to Myers (2001), firms' values are not likely to change if they borrow which causes the firm value to be indifferent on whether the borrowing is short or long term. It is clear that Modigliani and Miller's theory considers the items placed on the left side of balance sheet to be constant whether borrowing is made or not. But in real world when borrowing is made it will significantly affect the working capital and all those ratios related to it. To summarize the theory, it could be said that practically it cannot be used by firms to choose the optimal capital structure since the market utopia does not exist. Whenever borrowing is made, different items in financial statements will be altered and are likely to react either positively or negatively with leverage.

2.2 Trade-off Theory

According to Myers (2001), trade off theory is the approach firms use to choose the correct and estimated amount of internal financing (e.g. equity) and external financing. The first base of the theory is constructed by Kraus & Litzenberger (1992). They stated that there should be a balance between the cost of bankruptcy and the tax saving benefits of debt. This theory is often described as the opposite of pecking order theory. The theory explains how firms are providing their financial needs by a balance between debt and equity. It describes that there is always advantages in financing through debt and also there is a cost. The advantage could be the tax shield provided from paying interests and the threat could be the payback of the interest and principal of the amount borrowed (Frank, et al, 2005). The application of this theory has also been criticized from other researchers. For instance, Miller & Scholes, (1978) says that this balancing is akin to the balance between horse and rabbit content in a stew of one horse and one rabbit.

2.3 Pecking Order Theory

One of the most used theories in order to describe the capital structure is the theory which is introduced for the first time by Donaldson (1961). Later on the theory was more developed by Myers & Majluf (1984). Basically the theory explains that managers in firms tend to choose and seek internal funds rather than borrowing. According to it, Myers & Majluf (1984) developed this theory by including the importance issuing stock in raising fund. They said that according to pecking order theory, managers are supposed to have more knowledge on their own firms. This information include, growth opportunities and the risks associated to it. This is called information asymmetry (Brealey et al, 2006). The belief is that, managers in firms,

usually do not go after issuing those shares which could increase the shareholders' wealth and still has cause the risk to decrease the firms' NPV. So external investors are most likely to go after these firms and focus them as short term investment opportunities. Manager on the other hand tries not to reveal these information since it could be costly.

According to Myers & Majluf (1984) the basic assumptions of theory include that markets are perfect, there would no cost for issuing new stocks and the value of firms is calculated by information in the market.

2.4 Agency Costs Based Theory

When firms chose their capital structure according to agency costs, which is it is called agency costs based theory (Jensen, 1976). These costs are categorized as

- 1) Decreased in the amount for principal caused by the difference of agent's decisions from those which maximize the proportion of the principal.
- 2) Expenses in the bonding of the agent (the manager)
- 3) Monitoring expenses

2.5 Variables of Capital Structure

2.5.1 Tangibility

According to pecking order and tradeoff theory the tangibility and debt are positively correlated. It is proved that if firms has a large number of fixed assets, it could be used to diversify the risk and also lowering the interest rates (Stulz, 1990). It is considered to be safe in economy to use fixed assets as the collateral of debt. Although having a variety of fixed assets could be useful it could also causes problems too. According to Stulz (1990), large amount of fixed assets could

consume an even larger cost for monitoring them. Hence, it is expected that in huge firms with large amount of fixed assets, the debt required to cover the operating expenses to be higher (Haugen et al, 1986). The current study goes after the approach used by Wang (2011) to calculate the correct amount of tangibility.

2.5.2 Non Debt Tax shield

There have been many studies done on the impact of tax on debt, however none of them could clarify the accurate and correct effect of tax on debt. Since the interest paid on the loans and debt are deducted from the income, usually companies tend to borrow more to benefit from the tax deductible income (Hauge et al, 1986). Hence a positive and direct correlation exists among these variables.

According to Titman Wessel (1988) the debt is negatively correlated to tax rate. He states that when the deductible tax income increases firms are likely to reduce the level of internal funding which consequently could make the capital cost to increase.

2.5.3 Size

According to previous studies (Rajan & Zingales, 1995 & Michaelas et al. 1999) size is positively correlated to debt. Economy of scale could describe the reason clearly. When the size of firms increase the cost of debt could be highly reduced (Michaelas et al. 1999). It is also reported that size has positive correlation with debt according to pecking order and trade-off theories (Rajan 1995 & Zingales).

2.5.4 Growth Opportunities

In most of the previous studies it is concluded that growth and leverage are negatively correlated (Rajan & Zingales 1995). When firms face growth opportunities in any form, it is expected that firm widen its activities and as the

results the income will increase. Hence there wont the need of borrowing and firm could provide internal financing whenever extra financing is needed.

2.5.5 Profitability

Almost a huge number of past studies have concluded that the correlation between profitability and leverage is negative (Rajan & Zingales 1995). While firms are gaining profit, there will not be any need for borrowing.

2.5.6 Liquidity

There have been different studies done on the relation between liquidity and debt. Sheikh and Wang (2011) states that firms with high liquidity could be good target for those investors who are willing to go after short term investments. In some previous studies the relationship between leverage and liquidity is reported to be negative (Antoniou & Pleizzon 2008 and Mazur 2007). In another study done by Abdullah (2005) he concluded significant negative relationship between short term debt and liquidity exists.

2.7 Literature on Capital Structure in Turkey

There have been many studies done on the capital structure in Turkey. Ali and Ege (2013), targeted more than 242 firms in different sectors in Turkey for the period from 2000 to 2009. All firms are actively trading in bursa 100. They used panel regression to analyze their data. They concluded that firms in Turkey do not have ratio of debt targets. More specifically, they stated that trade-off theory is less successful in determining the capital structure of firms in Turkey. Hence it could be said that, Turkish firms' optimization of capital structure is more in line with pecking order theory. In another study done by Toraman et al. (2013), they investigated the capital structure of 28 Turkish firms from 2002 to 2011. They found negative

relation between short term and long term debt and return on assets. However, the relation between operating income and ROA is reported to be positive. Interestingly, they could not find a significant relationship between debt ratio and ROA. Karadeniz et al. (2009) investigate the optimal capital structure in lodging firms for the period between 1994 and 2006 with in a dynamic panel data. They concluded that effective tax rates and ROA are negatively correlated to debt. They also found that free cash flow, non-debt tax shields, growth opportunities, net commercial credit position, and firm size do not appear to be related to the debt ratio.

According to Aras, (2010), the world financial crisis had a severe impact on the Turkish economy. In his study which focuses on the deterministic variables of capital structure in Turkey, he states that the impact of the crisis was more on non-financial firm rather than financial ones. In fact, banking sector was not effected as strongly as other sectors. In another study by Gunay (2002) he investigates the capital structure of 96 firms for the period of 1999 to 2001. He concluded that Turkish firms with high leverage incurred more loss during and after the financial crisis.

2.8 Literature on Capital Structure in USA

Since USA has one of the most active financial markets in the world there have been many studies done on the determinants of capital structure about this country. In one the most recent studies done by Graham et al. (2014), they investigated the capital structure of firms for the whole century from 1900 to present. They concluded that the debt has been tripled from 1945 to 1970 and the changes are not only related to firms but also related to factors such as changes in government borrowing, macroeconomic uncertainty, and financial sector development. Another study which

is done by Coleman & Robb (2012) they tried to find the best theory of capital structure for new technology-based firms in USA. They focused on more than 4000 firm in USA and found out that, these firms are following different financing patterns. They found some supports for trade-off and pecking order theories but a single theory which could explain the whole structure was not found.

2.9 Empirical Studies on Crisis and Capital Structure

In a study done by Zarebski & Dimovski (2012) he contributes to the capital structure literature by investigating the determinants of capital structure of Australian Real Estate Investment Trusts (A-REITs) over the period 2006-2009. By using a panel approach and a Global Financial Crisis (GFC) dummy variable, his analysis incorporates the Global Financial Crisis (GFC) shock which appears to have affected the market after December 2007. He finds that A-REIT size, profitability, tangibility, operating risk and number of growth opportunities impact similarly to many previous studies of international entities upon the degree of leverage. He also found mixed support for prevailing capital structure theories of Pecking Order, Trade-off and Agency Theory, but find that Market Timing Theory can be rejected over the sample period. With specific focus after onset of the GFC, they find that the relationship between capital structure and the independent variables is somewhat distorted. Consequently, the postulations of theory also become distorted whereby changes to capital structure come about because of the primary goal to survive, rather than managerial opportunism. In another paper done by Smith & Mendoza (2012) they state that upon opening the capital account, domestic agents have an incentive to accumulate debt and sell domestic equity in order to share risk with the rest of the world. Due to a lower cost of capital, equity prices rise allowing agents to

accumulate a relatively large amount of debt without being constrained in the near term. As domestic agents accumulate debt and sell equity to re-balance their portfolio, however, adjustment costs force equity prices to subsequently fall. With a lower value of equity, agents within the emerging economy face a greater risk of hitting their credit constraint, triggering a debt deflation crisis. In the long run, the probability of a Sudden Stop is smaller as agents accumulate pre-cautionary savings to avoid the Sudden Stop. In summary, this chapter describes the basic theory of capital structure done by Modigliani and Miller. It could be said that practically it cannot be used by firms to choose the optimal capital structure since the market utopia does not exist. Whenever borrowing is made, different items in financial statements will be altered and are likely to react either positively or negatively with leverage. Trade off theory is the approach firms use to choose the correct and estimated amount of internal financing (e.g. equity) and external financing. Pecking order theory explains that managers in firms tend to choose and seek internal funds rather than borrowing.

Now this study uses pecking order theory as the choice of methodology. However, whenever it is needed (e.g. interpreting the results of analysis) the study takes under other studies too.

By reviewing the literature it is pretty clear that the research questions designed for this very research has not been focused on before. In other words a study which investigates different determinants of the optimal capital in a developed and a developing market is never done before. Furthermore, the study focuses deeply on the impacts of global economic crisis on both markets.

Chapter 3

RESEARCH DATA AND METHODOLOGY

The previous chapter of the study, tried to focus on the literature of capital structure in Turkey and USA. Different theories along with the definition of each variable were described. As it is mentioned already, this study is a comparison between two countries in two different markets. Turkey is active in emerging markets and USA considered to play an important role in developed markets. It could be really interesting to compare capital structure of different industries with in two different countries in two different markets. This chapter aims to select 5 different industries and 20 firms in each individual country and then uses the previous theories in capital structure to investigate the determinants of capital structure.

3.1 Research Design

One of the primary and important step of each study is the design of the research (Patel and Davidson, 2001). The procedure which ensures the researchers the obtained data is meaningful and lead to reliable results is through the research design (Yin, 2003). The current study is designed to discuss the following objectives. First, it tries to find out the determinants of leverage in the selected industries according to the previous literature. After on, it clears the differences between the countries with a full comparison between each industry. Figure 3.1 illustrates the procedure of the assessment in this study.

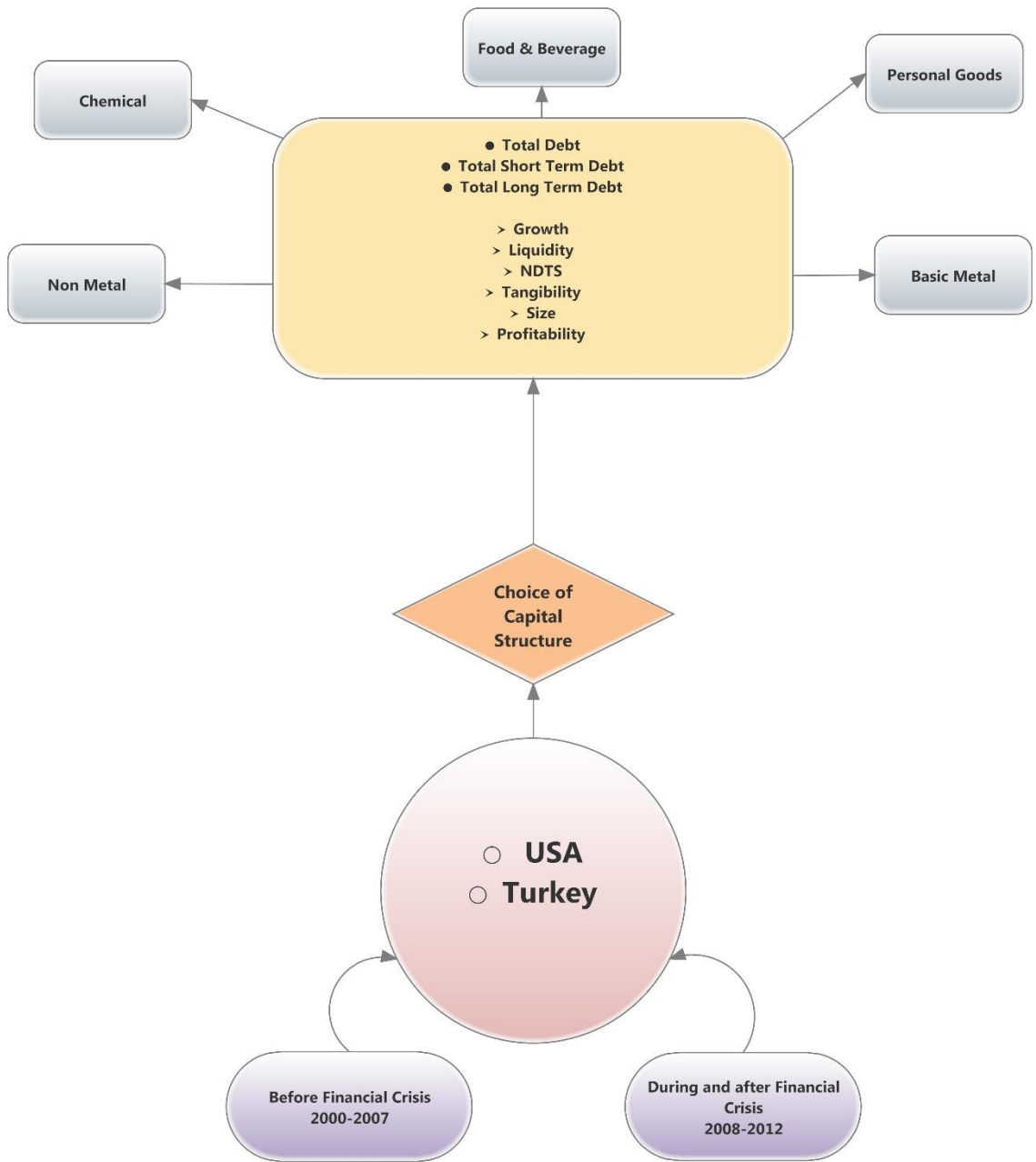


Figure 3.1: Conceptual Model

3.2 Research Data

According to Hallet (1978), there are two types of data being used by researchers. They are Secondary and primary data. Primary data is a type of information that is obtained directly from first-hand sources by means of surveys, observation or experimentation. It is data that has not been previously published and is derived from a new or original research study and collected at the source such as in marketing (Glass, 1976).

Secondary data, is data collected by someone other than the user. Common sources of secondary data for social science include censuses, organizational records and data collected through qualitative methodologies or qualitative research. Primary data, by contrast, are collected by the investigator conducting the research (Glass, 1976).

This study uses secondary data. The source to obtain the data is Thomson Reuters' data stream which is available at faculty of business administration, department of banking and finance at eastern Mediterranean university. Since the study focuses on the determinants of leverage, different ratios are selected according to pecking order theory. The reason behind choosing this model is that, most previous studies (brought in the previous chapter of this study) suggest that pecking order theory is best model to explain capital structure in Turkey and USA. These ratios are extracted from the financial statements of each firm within a 13 year period from 2000 to 2012. The firms are selected according to their market capitalization which is announced in the stock markets and indices that they are active in them. For firms

and industries in Turkey, Istanbul Stock Exchange (Borsa 100) and in USA S&P 500 index are used.

3.3 Research Sample

The study has chosen two different countries one in emerging markets and the other in developed markets. In emerging market, Turkey is chosen and in developed market USA was the choice of country. For each country 5 different industries are chosen. For each industry 4 firms are selected. Summary on the firms are represented in appendix A. The current study does not consider the financial institutions. It is believed that financial institutions have different nature and methods to choose their capital structure. As Rajan & Zingales (1995) stated, the structure of debt in financial institutions such as insurances or banks is different from those of non-financial firms. Since the study tries to compare two different countries from two different markets, industries and sectors had to be chosen within the condition of availability in both countries.

3.4 Variables

The focus of the current study is on capital structure of non-financial firms and determinants of debt in the selected industries. As it is mentioned in the literature review of the current study, there are still serious arguments on choosing only one method which could fully describe the optimal choice of capital in firms. Although some control variables are the same in most studies, a variety of other variables are often used in different studies. For instance, some previous studies such as Michaelas et al. (1999) or Rajan & Zingales (1995) used market to book ratio and age. However this study goes after a more recent study and chooses the variables according to it.

The variables are divided into dependents and control variables. According to Sheikh and Wang (2011) variables are categorized as:

3.4.1 Dependent Variables

According to Rajan & Zingales (1995), the dependent variables to assess the optimal choice of capital structure are, total debt ratio, total long term debt ratio and total short term debt ratio. Since the study investigates the financial recession in 2008, realizing the positive or negative of short and long term debt could be interesting.

Table 3.1: Definition on dependent variables

Dependent Variables	Definition of Variables	Abbreviation
Total Debt	Total Debt over Total Assets	TD
Total Long Term Debt	Total Long Term Debt over Total Assets	TLD
Total Short Term Debt	Total Short Term Debt over Total Assets	TSD

3.4.2 Independent Variables

As it is already said there are different sets of variables to choose in order to capture the capital structure of firms. This study however, goes after Sheikh & Wang (2011) to determine the optimal capital structure. The following table shows the variables and their definitions.

Table 3.2. Definition on independent variables

Control Variables	Definition of Variables	Abbreviation
Growth	Net Sales over Total Assets	GROWTH
Net Debt Tax Shield	Depreciation over Total Assets	NDTS
Liquidity	Current asset/Current Liability	LIQ
Profitability	Pre Tax Income/ Total Assets	PROF
Size	Natural Logarithm of Total Assets	SIZE
Tangibility	Fixed Assets/ Total Assets	TANG

3.5 Methodology

Previous chapters and parts tried to describe the aim and procedure of the current study. In this chapter the methodology used by the study to understand the relation between different variables is explained. According to Irny et al, (2005), methodology is defined as the systematic approach or analysis of all those techniques applied to a study. It also defines the body of methods and those principles related to a specific branch and section of knowledge. Following part of this section describes theoretical and analytical models, phases, hypothesis and quantitative or qualitative approaches which are used.

3.5.1 Descriptive Analysis

According to Oja (1983), descriptive statistics is a tool which represents the whole sample used for a study in context of descriptive coefficients of the collected data. The technique measures the central tendency by mean and median and variability by measuring Minimum, maximum and skewness and kurtosis of variables.

According to the specific features of the current study, this study provides different classification of descriptive analysis.

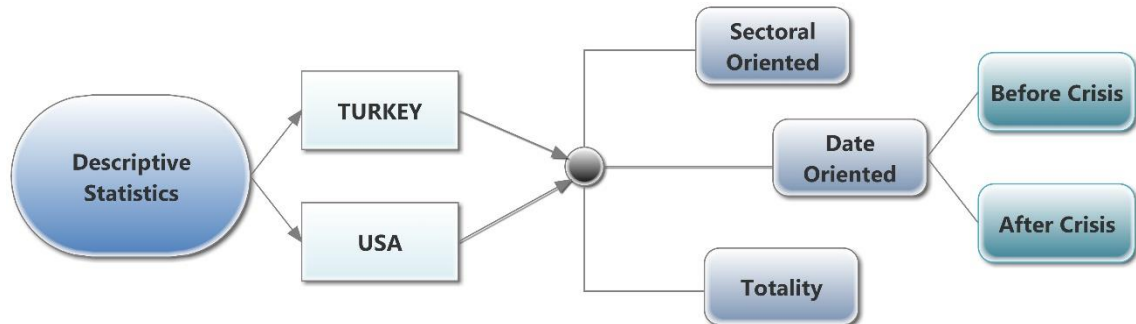


Figure 3.2. Descriptive steps

3.5.1.1 Descriptive Statistics in Turkey and USA

As it shown in figure 3.2, the first step of descriptive analysis is according to countries. Here descriptive Turkey descriptive analysis is represented. There are different statistical software which enable the researchers to implement this technique such as, Excel, STATA, SPSS and Eviews. This study is used Eviews to generate the data related to this specific analysis. The results of it are represented in the following table. Descriptive analysis Turkey

Table 3.4. Descriptive analysis Turkey

	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TSD	TLD
Mean	1.039	2.074	0.042	0.058	12.28	0.366	0.229	0.165	0.063
Median	0.935	1.609	0.037	0.058	12.21	0.362	0.212	0.1042	0.010
Maximum	3.031	12.26	0.160	0.386	16.41	0.864	0.686	0.656	0.530
Minimum	0.396	0.505	0.003	-0.343	9.816	0.040	0.000	0.000	0.000
Std. Dev.	0.490	1.673	0.024	0.105	1.300	0.154	0.179	0.161	0.101
Sum	265.1	528.9	10.72	15.04	3132.	93.38	58.58	42.28	16.30
Sum Sq. Dev.	61.20	711.0	0.151	2.810	429.9	6.087	8.203	6.638	2.621

Table 3.5. Descriptive analysis USA

	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	2.125	0.132	0.216	2.243	14.86	0.365	0.261	0.247	0.049
Median	0.965	0.039	0.108	2.092	15.05	0.339	0.269	0.241	0.023
Maximum	28.48	2.476	3.843	5.662	17.55	0.822	0.712	0.959	0.327
Minimum	0.306	0.012	-0.569	0.457	11.09	0.022	0.000	0.000	0.000
Std. Dev.	4.582	0.409	0.510	1.094	1.514	0.189	0.148	0.189	0.060
Sum	550.5	34.41	56.181	581.0	3849.	94.58	67.81	64.21	12.90
Sum Sq. Dev.	5416.	43.16	67.24	309.1	591.5	9.222	5.659	9.244	0.949

As it shown in table above, the whole sample is analyzed. As it is mentioned in this chapter, all the independent and dependent variables and the whole time horizon chosen for the study are gathered in this table. Hence this table represents the whole statistical description of all the data related to Turkey. Table 3.4, shows that the mean for Total debt in 5 different nonfinancial industries in Turkey. Total debt is the ratio of all debts over total assets which in this case changes from 0 % to 68%. Two different results are comprehended from these values. First, there are firms in the data set of the current study which are not leveraged; on the other hand, there are firms which are highly leveraged. The mean for this ratio in Turkey is almost .23 which shows that 23% of the assets are provided through all types of debts. This study focuses not only on total debt ratio of firms but also short term debt and long term debt ratios. Table 3.4 shows that during the time interval of 13 years from 2000 to 2013, mean for total short term ratio is 16.5% which states that 16.5 % of all the assets are provided through short term debt. Mean for total long term debt on the other hand stays lower than both total debt and total short term ratios. It is reported

to be 6.3% which represents the percentage of those long term debts with in the total assets of firms. Hence, it could be said that firms in Turkey are not highly leveraged with long term debt. It also could be said that, since the banking sector in Turkey were almost not affected during crisis (Aras, 2010), banks tend to not grant long term loans to Turkish firms. In terms of profitability, the results show that firms (selected for this study) in Turkey enjoyed a 5.8% of operating income on every unit of total assets. During the time horizon chosen for this study, Turkish firms generated profit up to 39% and also some of them faced loss down to -34%. Of course the time interval, includes the global financial crisis and loss in some firms could be related to that matter. According to Booth et. al (2001), profitability demonstrates the return on investment and fluctuations of return. That is why with the help of standard deviation of this ratio it could be said that return on investment in Turkey among the industries chosen for this study is 10.5 %. If this number is compared to the average profitability, it is clear that firms very low operating income (5%) when it is compared to its associated risk (almost twice as higher as average profitability). Average fix assets of firms in Turkey is reported to be 36.6 %. The fix assets ratio to total assets varies from 4.0 % to 86% for firms in Turkey. The average liquidity of firms in Turkey shows that the amount of current assets is almost twice as current liabilities. Now by looking at table 3.5 which illustrates the descriptive statistics of firms in USA, total debt ratio is close to Turkey. The average total debt in USA with in the same firms as Turkey is 26% which is almost 3 % more than Turkey. Firms in USA are 3 % more leveraged than Turkish firms which shows that 26 % of total assets of USA firms is provided through debt. Firms could have no long term and short debt and the maximum number of ratios are reported to be 95% and 71.2 % respectively. Both long term and short term debt ratios are higher than the same

ratios for Turkey which is truly correlated to their total assets. Average Profitability of firms in USA is 2.243 which shows the operating income of firms in USA. Regarding the standard deviation of the ratio, the profitability is almost twice as the risk associated to the investment in USA. Tangibility is almost the same in both countries while liquidity in USA is much lower than Turkey.

3.5.1.2 Descriptive Analysis – Sectorial Order

Turkey

In Turkey, the mean for total debt the least in cement industry with almost 8% of total assets and it is in its highest value in food industry with almost 34 %. The other interesting result is that mean for total debt ratio is really close in personal goods, steel and food industry. The liquidity is at highest in cement industry and lowest in food industry. Tangibility ratio is reported to be almost the same in all industries and mean of profitability is very low and in some cases such as personal goods industry is reported to be negative. Most industries have high standard deviation of profitability with low operating income, which shows the risk associated to investing in these industries.

Table 3.6. Descriptive Statistics-Sectorial Order in Turkey

CEMENT	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	0.784910	3.842149	0.049485	0.144115	12.27094	0.403396	0.073933	0.027803	0.046130
Median	0.721838	2.703801	0.038973	0.150238	12.37157	0.389188	0.045995	0.000000	0.022151
Maximum	1.266293	12.26913	0.160721	0.386960	13.50256	0.715514	0.499758	0.367321	0.400741
Minimum	0.396581	0.778270	0.009046	-0.178444	10.30508	0.134102	0.000000	0.000000	0.000000
Std. Dev.	0.263533	2.835469	0.028231	0.110201	0.817269	0.115582	0.102717	0.060782	0.069914
Sum	40.81531	199.7918	2.573203	7.493985	638.0890	20.97659	3.844533	1.445761	2.398765
Sum Sq. Dev.	3.541943	410.0340	0.040646	0.619356	34.06438	0.681322	0.538089	0.188415	0.249284

Table 3.6. Descriptive Statistics-Sectorial Order in Turkey (continued)

Chemical	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.174277	1.995091	0.027934	0.107299	12.35939	0.355658	0.114394	0.048459	0.065936
Median	0.954525	1.772650	0.027889	0.105605	12.00276	0.398205	0.091631	0.030021	0.050698
Maximum	2.876387	4.699660	0.073541	0.337876	14.90137	0.563619	0.366034	0.219482	0.267778
Minimum	0.603802	0.812177	0.003861	-0.024097	9.827038	0.083761	0.000000	0.000000	0.000000
Std. Dev.	0.580986	0.813625	0.013736	0.066418	1.279831	0.145792	0.099799	0.059983	0.063075
Sum	61.06240	103.7447	1.452544	5.579562	642.6885	18.49423	5.948469	2.519850	3.428651
Sum Sq. Dev.	17.21480	33.76128	0.009622	0.224980	83.53636	1.084023	0.507950	0.183498	0.202902
FOOD	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.019533	1.262646	0.050589	-0.000679	11.72471	0.393957	0.338610	0.089467	0.249143
Median	0.979929	1.180118	0.041793	0.014407	11.39491	0.363030	0.362649	0.019026	0.212578
Maximum	1.524384	2.649304	0.118642	0.198283	13.29479	0.680142	0.686705	0.530977	0.630396
Minimum	0.497096	0.505298	0.005061	-0.343159	9.833816	0.134299	0.000000	0.000000	0.000000
Std. Dev.	0.246616	0.472724	0.027643	0.109694	1.053773	0.144284	0.206706	0.138543	0.176571
Sum	49.95709	61.86965	2.478847	-0.033256	574.5108	19.30391	16.59189	4.383862	12.20802
Sum Sq. Dev.	2.919340	10.72648	0.036680	0.577568	53.30105	0.999258	2.050919	0.921322	1.496509
PersonalG	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	0.922365	1.385338	0.047499	-0.003783	12.36808	0.345752	0.312762	0.040645	0.272117
Median	0.925669	1.238055	0.045691	0.006979	12.30440	0.330065	0.324073	0.001975	0.255371
Maximum	1.462660	2.623222	0.122913	0.163162	14.07346	0.716377	0.666459	0.227001	0.656390
Minimum	0.421169	0.869321	0.011604	-0.336669	10.52425	0.040712	0.005141	0.000000	0.002265
Std. Dev.	0.278990	0.364058	0.021755	0.088852	0.827308	0.155314	0.140792	0.061319	0.141996
Sum	47.96300	72.03758	2.469972	-0.196724	643.1401	17.97910	16.26361	2.113518	14.15009
Sum Sq. Dev.	3.969594	6.759463	0.024138	0.402631	34.90637	1.230243	1.010936	0.191760	1.028308
STEEL	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.306514	1.830848	0.035042	0.043984	12.68923	0.332564	0.318717	0.116771	0.201945
Median	1.171492	1.666796	0.034117	0.042927	11.67105	0.294241	0.328256	0.068383	0.146399

Table 3.6. Descriptive Statistics-Sectorial Order in Turkey (continued)

Maximum	3.036656	4.493381	0.104476	0.150882	16.41002	0.864371	0.571585	0.508658	0.571585
Minimum	0.484926	1.017613	0.003813	-0.058328	9.816676	0.078238	0.071336	0.000000	0.000000
Std. Dev.	0.713526	0.741702	0.019798	0.044473	2.019727	0.196850	0.128258	0.132189	0.169291
Sum	65.32572	91.54238	1.752104	2.199202	634.4614	16.62818	15.93583	5.838552	10.09723
Sum Sq. Dev.	24.94684	26.95596	0.019205	0.096914	199.8855	1.898752	0.806051	0.856223	1.404305

USA

In USA, the mean for total debt the least in personal goods industry with almost 16% of total assets and it is in its highest value in food industry with almost 40 %.The liquidity is at highest in personal goods industry and lowest in food industry. Tangibility ratio is reported to be at lowest in personal goods and mean of profitability is very high in cement industry and is at lowest in chemical industry. It is shown that the most profitable industry regarding the ratio itself and its standard deviation is food industry.

Table 3.7. Descriptive Statistics-Sectorial Order in USA

CEMENT	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	5.925519	2.187707	0.510841	0.623186	13.80390	0.496157	0.251071	0.396617	0.033502
Median	0.759345	2.246400	0.057027	0.100749	14.17514	0.491429	0.278168	0.309312	0.022933
Maximum	28.48091	4.040736	2.476917	3.843062	16.00564	0.762066	0.448489	0.959784	0.237980
Minimum	0.306896	0.457731	0.030379	-0.023052	11.13093	0.270557	0.000913	0.000730	0.000000
Std. Dev.	9.307268	0.767749	0.814420	1.028341	1.610912	0.125644	0.104590	0.274321	0.043646
Sum	308.1270	113.7608	26.56374	32.40570	717.8029	25.80017	13.05568	20.62410	1.742105
Sum Sq. Dev.	4417.887	30.06137	33.82730	53.93174	132.3469	0.805108	0.557887	3.837841	0.097155

Table 3.7. Descriptive Statistics-Sectorial Order in USA (continued)

Chemical	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	0.845243	2.105749	0.048360	0.088693	15.33491	0.420812	0.231083	0.185103	0.045980
Median	0.808919	1.966385	0.047346	0.095817	15.35452	0.381018	0.267347	0.239481	0.020930
Maximum	1.280411	3.869207	0.071476	0.197348	16.71087	0.633112	0.422592	0.411309	0.210627
Minimum	0.620453	0.708116	0.028786	-0.137594	14.11392	0.186386	0.000960	0.000000	0.000172
Std. Dev.	0.163334	0.931151	0.011490	0.073432	0.709364	0.166683	0.138079	0.137999	0.055900
Sum	43.95266	109.4989	2.514721	4.612022	797.4155	21.88222	12.01634	9.625368	2.390974
Sum Sq. Dev.	1.360586	44.21916	0.006733	0.275003	25.66308	1.416938	0.972358	0.971236	0.159366
FOOD	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.189721	1.178681	0.036867	0.119434	16.19762	0.286339	0.401213	0.299189	0.102024
Median	1.164708	0.967962	0.034842	0.112918	16.28986	0.271523	0.398963	0.289498	0.085894
Maximum	2.191325	2.310738	0.073209	0.220147	17.55776	0.516084	0.712683	0.541925	0.327809
Minimum	0.480593	0.470642	0.017896	0.018375	14.99337	0.152273	0.210407	0.132641	0.002441
Std. Dev.	0.419336	0.526372	0.012797	0.055752	0.733379	0.095256	0.117332	0.094726	0.074206
Sum	61.86548	61.29144	1.917074	6.210573	842.2764	14.88965	20.86309	15.55782	5.305263
Sum Sq. Dev.	8.967978	14.13045	0.008352	0.158521	27.43006	0.462763	0.702101	0.457628	0.280832
PersonalG	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.667710	3.297259	0.026843	0.111962	13.32634	0.139728	0.165987	0.112286	0.053702
Median	1.488653	3.167368	0.026853	0.123101	13.49402	0.147404	0.127038	0.052734	0.023560
Maximum	3.063653	5.662254	0.046295	0.306575	14.78687	0.293787	0.582673	0.511007	0.216792
Minimum	0.825011	1.661652	0.012794	-0.102272	11.09357	0.022507	0.000000	0.000000	0.000000
Std. Dev.	0.602535	1.113783	0.007403	0.090172	0.978652	0.067790	0.161398	0.141152	0.059299
Sum	85.05321	168.1602	1.369013	5.710039	679.6434	7.126138	8.465361	5.726565	2.738797
Sum Sq. Dev.	18.15242	62.02565	0.002741	0.406545	47.88801	0.229771	1.302461	0.996191	0.175819

Table 3.7. Descriptive Statistics-Sectorial Order in USA (continued)

STEEL	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	0.990553	2.467232	0.039370	0.139297	15.62706	0.478510	0.257903	0.243952	0.013952
Median	0.859746	2.343998	0.038963	0.117523	15.56853	0.463448	0.227289	0.224999	0.008709
Maximum	1.903289	5.002665	0.081317	0.523095	17.52078	0.822304	0.555233	0.506462	0.067476
Minimum	0.360986	0.872448	0.017286	-0.569905	13.81275	0.192226	0.100142	0.089955	0.000000
Std. Dev.	0.463653	0.878503	0.012974	0.180985	0.938721	0.181019	0.107580	0.103904	0.015527
Sum	51.50874	128.2961	2.047253	7.243454	812.6072	24.88254	13.41098	12.68549	0.725485
Sum Sq. Dev.	10.96370	39.36013	0.008585	1.670525	44.94101	1.671159	0.590242	0.550601	0.012296

On the other hand, cement industry is reported to the riskiest industry in terms of profitability and standard deviation.

3.5.1.3 Descriptive analysis- Date Oriented

USA

Before the crisis, total debt is reported to be 25% of total assets in USA and it increases with almost 1% during and after crisis. Total short term and long term debt have not changes a lot before and after crisis. Mean for profitability is decreased during and after crisis by almost 8 % which is normal since the financial recession was ongoing in the period.

Table 3.8. Descriptive Statistics Date Oriented

USBEFORE	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	2.098330	2.160855	0.123735	0.244339	14.63430	0.373760	0.257146	0.234952	0.055926
Median	0.959025	1.959214	0.041892	0.112687	14.86011	0.355500	0.257161	0.220102	0.029631
Maximum	23.54625	5.662254	1.998139	3.843062	17.52078	0.822304	0.712683	0.884058	0.327809
Minimum	0.360986	0.457731	0.016189	-0.137594	11.09357	0.022507	0.000000	0.000000	0.000000
Std. Dev.	4.338327	1.115390	0.358686	0.575539	1.506264	0.195107	0.149841	0.180229	0.067096
Sum	335.7328	345.7369	19.79758	39.09427	2341.488	59.80153	41.14342	37.59225	8.948202
Sum Sq. Dev.	2992.552	197.8112	20.45628	52.66792	360.7440	6.052595	3.569942	5.164744	0.715796
USAFTER	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	2.169437	2.376471	0.147618	0.172601	15.23493	0.351305	0.269374	0.268961	0.039944
Median	1.030291	2.243531	0.035761	0.099029	15.35643	0.277919	0.275674	0.266214	0.018192
Maximum	28.48091	5.140986	2.476917	2.597517	17.55776	0.685222	0.582673	0.959784	0.210627
Minimum	0.306896	0.537495	0.012794	-0.569905	11.17808	0.036622	0.000000	0.000000	0.000000
Std. Dev.	4.973186	1.052132	0.480964	0.381548	1.459584	0.178961	0.145709	0.202250	0.047169
Sum	214.7743	235.2706	14.61422	17.08752	1508.258	34.77919	26.66803	26.62710	3.954422
Sum Sq. Dev.	2423.793	108.4843	22.66994	14.26672	208.7779	3.138657	2.080657	4.008705	0.218046

Turkey

Before the crisis, total debt is reported to be 22% of total assets in Turkey and it increases with almost 1% during and after crisis. Total short term and long term debt have not changes a lot before and after crisis. Mean for profitability is decreased during and after crisis by almost 1 % which is normal since the financial recession was ongoing in the period.

Table 3.9. Descriptive Statistics-Sectorial Order

BEFORE	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	1.083515	2.101791	0.049178	0.062775	11.94360	0.375384	0.226192	0.064770	0.161422
Median	0.949215	1.609882	0.043416	0.070066	11.80101	0.364350	0.214006	0.007331	0.097172
Maximum	3.036656	12.26913	0.160721	0.386960	16.06157	0.864371	0.686705	0.530977	0.656390
Minimum	0.425583	0.505298	0.003813	-0.343159	9.816676	0.078238	0.000000	0.000000	0.000000
Std. Dev.	0.512157	1.866745	0.027601	0.114210	1.197423	0.160606	0.185882	0.106967	0.165204
Sum	167.9449	325.7776	7.622540	9.730129	1851.258	58.18447	35.05983	10.03939	25.02048
Sum Sq. Dev.	40.39498	536.6497	0.117319	2.008750	220.8085	3.972341	5.321006	1.762059	4.203013
AFTER	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
Mean	0.971787	2.032085	0.031041	0.053126	12.81631	0.351975	0.235245	0.062622	0.172623
Median	0.912016	1.608984	0.031119	0.048432	12.78025	0.351609	0.212607	0.016986	0.115106
Maximum	2.898809	7.576239	0.052460	0.337876	16.41002	0.647680	0.583784	0.445903	0.570608
Minimum	0.396581	0.594984	0.005180	-0.190527	10.50794	0.040712	0.000000	0.000000	0.000000
Std. Dev.	0.450046	1.325965	0.011801	0.089658	1.282357	0.145009	0.170477	0.093147	0.156586
Sum	97.17867	203.2085	3.104130	5.312640	1281.631	35.19753	23.52450	6.262152	17.26227
Sum Sq. Dev.	20.05159	174.0601	0.013787	0.795824	162.7996	2.081739	2.877182	0.858951	2.427399

3.6 Equations

Previous parts of this chapter tried to explain different variables and their

contribution to the study. This part however, focuses on the applied model and develop hypothesis according to the literature and variables chosen for the study.

This study uses the model applied by Booth et. al (2001) and Sheikh & Wang (2011). Since the data includes both time series and cross section data, the approach

used in the study is Pooled panel ordinary least squares (OLS) regression model which is according to (Booth et. al 2001).

General form of simple linear regression model is showed by the following equation:

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \quad (1)$$

Where Y represents the dependent and X is the independent variable, respectively; α is the intercept and β is the slope of the linear function and both are constant. As it is mentioned before, the study uses panel regression (Mix of time series and cross section) due to the nature of data. The formulation of it with more explanatory variables is as following:

$$Y_{it} = \alpha_i + \beta_{i1}X_{1i} + \beta_{2i}X_{2i} + \dots + \beta_{ij}X_{ji} + \mu_{it} \quad (2)$$

In this equation, Y represents the dependent variable and X stands for independent variables. To count the independent variable i is used and j is the indices which represents the cross sectional and time series dimension of data. α and β represents the coefficient of variables.

There is another reason which makes the study to choose panel regression. According to Schulman et al (1996), panel data enables the researchers to analyze the complex data more in depth.

The exact formulations applied by the study according to variables are as following:

$$TD_{it} = \beta_0 + \beta_1GROW_{it} + \beta_2LIQ_{it} + \beta_3PROF_{it} + \beta_4NDTS_{it}$$

$$+ \beta_5 \text{SIZE}_{it} + \beta_6 \text{TANG}_{it} + \mu_{it} \quad (3)$$

$$\begin{aligned} \text{STD}_{it} = & \beta_0 + \beta_1 \text{GROW}_{it} + \beta_2 \text{LIQ}_{it} + \beta_3 \text{PROF}_{it} + \beta_4 \text{NDTS}_{it} \\ & + \beta_5 \text{SIZE}_{it} + \beta_6 \text{TANG}_{it} + \mu_{it} \end{aligned} \quad (4)$$

$$\begin{aligned} \text{LTD}_{it} = & \beta_0 + \beta_1 \text{GROW}_{it} + \beta_2 \text{LIQ}_{it} + \beta_3 \text{PROF}_{it} + \beta_4 \text{NDTS}_{it} \\ & + \beta_5 \text{SIZE}_{it} + \beta_6 \text{TANG}_{it} + \mu_{it} \end{aligned} \quad (5)$$

3.7 Hypothesis

3.7.1 Hypothesis for First Research Question

According to the chosen model (pecking order theory) and previous literature (Sheikh & Wang 2011) the following alternative hypotheses are developed with the goal of describing the possible effect of chosen independent variables on debt in firms in different industries in two countries of Turkey and USA of America.

According to the research questions of the study which are:

- 1) What are the determinants of capital structure if firms in Turkey and USA?
- 2) Financial Crisis affected the determinants of capital structure if firms in Turkey and USA.

The following hypotheses are developed.

H1: Total Long term debt, short term debt and total debt ratios are positively related to tangibility.

H2: Total Long term debt, short term debt and total debt ratios are positively related to size.

H3: Total Long term debt, short term debt and total debt ratios are reversely related to profitability.

H4: Total Long term debt, short term debt and total debt ratios are reversely related to liquidity.

H5: Total Long term debt, short term debt and total debt ratios are reversely related to growth.

H6: Total Long term debt, short term debt and total debt are directly and positively related to net debt tax shield.

3.7.2 Hypothesis for second research question

Tangibility, size, profitability, non-debt tax shield, liquidity and growth had impact on level of debt during financial crisis.

This section focused on the methodologies and data used for the study. Different equations with different variables were introduced. Descriptive statistics were represented to get a general idea on firms and sectors used for the study. The following chapter focuses on the regression results and analyses the data deeper.

Chapter 4

EMPIRICAL RESULTS

4.1 Introduction

The previous chapter focused on the methodology and model used by the study. Series of different hypotheses were developed according to different variables and their relation to the applied theory. Different types of descriptive analysis were ran on Eviews to compare the results between sectors, dates and countries.

The following chapter on the other hand is more analytical. It provides the techniques used to investigate the relation between variables. First a correlation matrix will be described and after on series of regression to test the developed hypotheses. Figure 4.1 shows the steps of the analysis.



Figure 4.1. Analysis Steps

4.2 Correlation Analysis

To test the possibility of Multicollinearity problem between variables, Pearson's Correlation analysis is applied in Eviews. Multicollinearity is a term which refers to those variables in a multiple regression model that are highly correlated. The problem causes prediction of one variable through one another by a non-trivial degree in accuracy. If the degree of Multicollinearity is high, it could prevent the statistical software from the matrix which is used to compute the regression coefficients. It is said that in a data set the chances to meet the Multicollinearity problem is relatively low (Sekaran & Bougie, 2010). To make sure the data set in the current study does not face the problem Pearson's correlation matrix is ran in Eviews. An approach that this study is used is according to Lewis & Chaney (1993). He argues that in Pearson's correlation matrix if the coefficients are lower than 0.8 the Multicollinearity is not a problem in neither of countries.

Table 4.1. Correlations

TURKEY	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
GROWTH	1.000000	-0.239172	-0.077076	-0.017523	-0.189700	-0.380929	0.137745	-0.186756	0.270483
LIQ	-0.239172	1.000000	-0.157514	0.541788	0.073612	-0.087785	-0.439504	-0.036265	-0.465790
NDTS	-0.077076	-0.157514	1.000000	-0.225669	-0.234870	0.346454	0.084706	-0.017949	0.105447
PROF	-0.017523	0.541788	-0.225669	1.000000	0.072718	-0.199531	-0.565998	-0.269593	-0.459785
SIZE	-0.189700	0.073612	-0.234870	0.072718	1.000000	0.269407	0.031321	0.096078	-0.025559
TANG	-0.380929	-0.087785	0.346454	-0.199531	0.269407	1.000000	-0.100956	0.056665	-0.147835
TD	0.137745	-0.439504	0.084706	-0.565998	0.031321	-0.100956	1.000000	0.451407	0.827993
TLD	-0.186756	-0.036265	-0.017949	-0.269593	0.096078	0.056665	0.451407	1.000000	-0.126595
TSD	0.270483	-0.465790	0.105447	-0.459785	-0.025559	-0.147835	0.827993	-0.126595	1.000000

Table 4.1. Correlations (continued)

USA	GROWTH	LIQ	NDTS	PROF	SIZE	TANG	TD	TLD	TSD
GROWTH	1.000000	0.113701	0.976765	0.900831	-0.574849	-0.104575	-0.210141	0.691274	-0.102944
LIQ	0.113701	1.000000	0.071015	0.067235	-0.492992	-0.333648	-0.668217	-0.289211	-0.528404
NDTS	0.976765	0.071015	1.000000	0.848093	-0.524984	-0.010067	-0.168603	0.725863	-0.107996
PROF	0.900831	0.067235	0.848093	1.000000	-0.501363	-0.012127	-0.172589	0.632262	-0.079074
SIZE	-0.574849	-0.492992	-0.524984	-0.501363	1.000000	0.276594	0.454813	-0.125533	0.112669
TANG	-0.104575	-0.333648	-0.010067	-0.012127	0.276594	1.000000	0.234198	0.223076	-0.214411
TD	-0.210141	-0.668217	-0.168603	-0.172589	0.454813	0.234198	1.000000	0.487378	0.459816
TLD	0.691274	-0.289211	0.725863	0.632262	-0.125533	0.223076	0.487378	1.000000	-0.048597
TSD	-0.102944	-0.528404	-0.107996	-0.079074	0.112669	-0.214411	0.459816	-0.048597	1.000000

According to table 4.1, in Turkey, total debt, short term debt and long term debt are negatively correlated to liquidity, profitability and tangibility. It could be said that as debt increases these variables tend to decrease. In USA, only liquidity is negatively correlated to these three variables. Debt tax shield and size are negatively correlated to debt in Turkey wherein USA these ratio sare positively correlated to total debt. Interestingly short term debt is negatively correlated to all the ratios in Turkey which could be said that as short term debt increases these variables tend to decrease.

4.3 Regression Analysis

The results of regression analysis is reported in this chapter. After running series of tests to make sure the data does not have any problems regarding common statistical issues, the regression is run in Eviews according to the chosen model. Firstly, the

current chapter discusses the possible problems regarding the data and discusses the results of them and after a complete analysis of the regression will be represented.

4.3.1 Heteroskedasticity

Heteroscedastic In statistics, a sequence of random variables is Heteroscedastic, or Heteroskedastic, if the random variables have different variances. The term means "differing variance" and comes from the Greek "hetero" ('different') and "skedasis" ('dispersion'). In contrast, a sequence of random variables is called homoscedastic if it has constant variance. Suppose there is a sequence of random variables $\{Y_t\}_{t=1}^n$ and a sequence of vectors of random variables, $\{X_t\}_{t=1}^n$. In dealing with conditional expectations of Y_t given X_t , the sequence $\{Y_t\}_{t=1}^n$ is said to be Heteroskedastic if the conditional variance of Y_t given X_t , changes with t . Some authors refer to this as conditional Heteroscedasticity to emphasize the fact that it is the sequence of conditional variance that changes and not the unconditional variance. In fact it is possible to observe conditional Heteroscedasticity even when dealing with a sequence of unconditional Homoscedastic random variables, however, the opposite does not hold. When using some statistical techniques, such as ordinary least squares (OLS), a number of assumptions are typically made. One of these is that the error term has a constant variance. This might not be true even if the error term is assumed to be drawn from identical distributions.

In Eviews it is common to use white test to assess the existence of Heteroskedasticity. The current study uses panel regression and unfortunately Eviews does not support white test for panels. Hence, the data was tested in unstructured/undated format. The result of the white test strongly rejected the Heteroskedasticity problem since the coefficient is statistically significant.

4.3.2 Autocorrelation

Autocorrelation refers to the correlation of a time series with its own past and future values. Autocorrelation is also sometimes called “lagged correlation” or “serial correlation”, which refers to the correlation between members of a series of numbers arranged in time. Positive autocorrelation might be considered a specific form of “persistence”, a tendency for a system to remain in the same state from one observation to the next. For example, the likelihood of tomorrow being rainy is greater if today is rainy than if today is dry. Geophysical time series are frequently autocorrelated because of inertia or carryover processes in the physical system. For example, the slowly evolving and moving low pressure systems in the atmosphere might impart persistence to daily rainfall. Or the slow drainage of groundwater reserves might impart correlation to successive annual flows of a river. Or stored photosynthates might impart correlation to successive annual values of tree-ring indices. Autocorrelation complicates the application of statistical tests by reducing the number of independent observations. Autocorrelation can also complicate the identification of significant covariance or correlation between time series (e.g., precipitation with a tree-ring series). Autocorrelation can be exploited for predictions: an auto correlated time series is predictable, probabilistically, because future values depend on current and past values. Autocorrelation is usually checked via the value of Durbin Watson test which is located in the regression table of results. The value is said to be between zero to four. Values equal and greater than 2 are considered to reject the possibility of autocorrelation problem. Values toward four indicate the negative autocorrelation while values approaching to zero strongly shows autocorrelation. The values for each regression is allocated under its own

table. Generally Durbin Watson value for most of the regression is higher than 2 which rejects the autocorrelation problem.

4.3.3 Unit root Test

To follow up the regression analysis unit root test is a classic approach which shows whether the data is stationary or not. Stationary data is defined as those data which mean, variance and covariance do not changes over time. There has been different methods and techniques defined to run this test, however the study uses panel unit root test via EViews. According to the results of the tests all the variables are reported to be stationary. There are different criteria to examine whether data is stationary or non-stationary. Augmented Dicky Fuller and Philip Pherons are among the most methods used among researchers. However, the current study uses the results of above mentioned techniques and Levin Lin Chu test. In panel regression, when the P-value is related to these tests it is said to be statistically significant, so it is said the variable is stationary Results are shown in Appendix A.

4.4 Regression Results

4.4.1 Regression analysis

This part represents the regression results. Results are divided in to three different levels according to the dependent variables before and after crisis. First results on total debt in Turkey and U.S.A are discussed and following it, factors cause possible changes in total short term debt and total long term debt are discussed.

4.4.2 Results on total debt (2000-2012)

Table 4.2 represents the results of regression analysis in Turkey during the whole time interval chosen for the study from 2000 to 2012. As it shown for the whole period, profitability and tangibility are the only variables which could predict changes in debt.

Profitability

In table 4.2, profitability is statistically significant with the coefficient of -0.29 which could be interpreted as, by a unit of change in profitability debt is likely to decrease by 0.29 . The result on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder & Myers (1999), Fama & French (2002), Frank & Goyal (2005), Gaud et al., (2005). The results on profitability is according to the pecking order theory which states a negative relation between debt and profitability. According to Frank and Goyal (2005), when a firm is in profit, borrowing could effectively reduce the profitability. In other words the relation between debt and profitability is reverse in profitable firms. Results state that hypotheses 3 (H3) which assumes a negative correlation between debt and profitability is supported for Turkey.

Now by looking at table 4.3, it is reported that profitability is statistically significant with the coefficient of -0.07 . The negative effect of profitability on debt in USA is not as strong as Turkey, however it supports the theory of pecking order theory which implies a negative relation between profitability and debt. Similar studies such as Jong et al., (2008), Hovakimian & Li (2011), support the findings in this part. Results state that hypotheses 3 (H3) which assumes a negative correlation between debt and profitability is supported for USA.

Tangibility

The ratio of total fixed assets over total assets is called tangibility in this study. After regression analysis it shown that the ratio is only statistically significant in Turkey. According to the coefficient, the ratio is negatively related to debt which is in contradiction with the assumption of pecking order theory. However others such as Almeida & et al., (2009) found negative correlation between the two variables. Although the coefficient is positive in USA, but remains not significant in USA. Results state that hypotheses 1 (H1) which assumes a positive correlation between debt and tangibility is rejected for Turkey.

Liquidity

It is said that liquidity is one of the most important tools which could assist the troubled firms in case of bankruptcy and debt. Dubey et al., (1989). The ratio is calculated through the division of current assets over current liabilities in this study. If the value is greater than 1, the firms is said to have a high liquidity. The ratio is not statistically significant in Turkey, however it is reported to be predict the changes in debt in USA. According to the pecking order theory, there is a negative relationship between liquidity and debt and since the coefficient of the variable is reported to be negative here, the result on the variable is supported by this theory. It is stated by (Abdullah, 2005), when firms have high level of liquidity, do not seek after debt. Previous literature on capital structure, reported the same correlation between liquidity and debt (Panno, 2003); (Voulgaris et al., 2004).

Size

The study calculated size base on the formula given by Sheikh & Wang (2011) which is the natural logarithm of sales. The ratio is considered to have a negative correlation with debt according to pecking order theory and results in USA are also

according to this theory. The ratio is statistically significant with the coefficient of -0.08. The result of the ratio is in line with previous studies such as (Cassar & Holmes, 2003) and (Deesomsak, et al., 2004). Results state that hypotheses 2 (H2) which assumes a positive correlation between debt and size is rejected for USA.

Table 4.2. results on total debt in Turkey (2000-2012)

TURKEY	Coefficient	Std. Error	Prob.
C	-0.006867 (-0.995821)	0.006896	0.3206
GROWTH	0.033123 (1.208502)	0.027408	0.2283
LIQ	-0.006695 (-1.078601)	0.006207	0.2821
NDTS	-0.544676 (-1.619342)	0.336356	0.1070
PROF	-0.298360 (-4.805678)	0.062085	0.0000
SIZE	0.003091 (0.105618)	0.029268	0.9160
TANG	-0.201672 (-2.604729)	0.077425	0.0099

Adjusted R-squared: 0.224086 , R-squared: 0.343970 ,
 Prob(F-statistic): 0.000002 , F-statistic: 2.869193 ,
 Durbin-Watson stat : 2.158644

Table 4.3. results on total debt in USA (2000-2012)

USA	Coefficient	Std. Error	Prob.
C	-0.008345 (-1.925451)	0.004334	0.0556
GROWTH	-0.004442 (-0.451346)	0.009842	0.6522
LIQ	-0.026999 (-3.604160)	0.007491	0.0004
NDTS	-0.295962 (-2.155565)	0.137301	0.3230
PROF	-0.074572 (-2.346023)	0.031786	0.0199
SIZE	-0.08825 (-4.282415)	0.020608	0.0000
TANG	-0.011401 (-0.116395)	0.097952	0.9075

Adjusted R-squared: 0.252490 , R-squared: 0.365086
 Prob(F-statistic): 0.0000, F-statistic: 3.242452,
 Durbin-Watson stat : 2.146733

4.4.3 Results on total short term debt before crisis

Table 4.4 and 4.5 represent the results of regression by considering total short term debt before crisis in Turkey and USA.

Tangibility

In Turkey, tangibility, size, profitability and growth are statistically significant. Tangibility is statistically significant with positive relation to TSD. The result is supported by pecking order theory. The positive correlation between the two variables shows that firms with high tangible assets tend to borrow more. The result on tangibility is also in line with trade-off theory which argues that firms generally tend to use debt financing rather than other financing ways. The ratio is reported as non-significant for USA. The results support H1.

Size

Size is statistically significant with negative coefficients in both countries which is according to pecking order theory. Since the ratio is representing the sales, it could be said that by decrease in sale, the need for borrowing increases. The coefficient in Turkey is larger than USA which shows that firms in Turkey suffer more than USA firms in case of sales and in case of low sales, they have to borrow more. Accordingly H2 is rejected.

Profitability

Profitability is only significant in Turkey. As it is expected from pecking order theory, the coefficient is negatively related to TSD. The results on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder and Myers (1999), Fama & French (2002), Frank & Goyal (2005), Gaud et al., (2005). The results state that the third hypothesis (H3) is supported.

Liquidity

Liquidity is only significant in USA. The result is according to pecking order theory. The coefficient is small, however, when the firm is liquid enough there is no need for

further financing which effect the current assets. According to the hypotheses developed for the study, H4 is accepted.

Table 4.4. Total Short Debt before crisis, Turkey

TURKEY	Coefficient	Std. Error	Prob.
C	-1.160836 (-2.951088)	0.393359	0.0038
TANG	0.325994 (2.811717)	0.115941	0.0057
SIZE	-0.119546 (-3.774369)	0.031673	0.0002
PROF	-0.478295 (-3.865550)	0.123733	0.0002
NDTS	-0.855500 (-1.650600)	0.518296	0.1014
LIQ	-0.008357 (-1.097317)	0.007616	0.2747
GROWTH	0.098269 (2.209426)	0.044477	0.0290

Adjusted R-squared: 0.620078, R-squared: 0.699023 ,Prob(F-statistic): 0.000000 , F-statistic: 8.854562 , Durbin-Watson stat : 1.340126

Table 4.5. Total Short Debt before crisis, USA

USA	Coefficient	Std. Error	Prob.
C	0.873760 (4.595626)	0.190129	0.0000
GROWTH	-0.005720 (-0.541660)	0.010561	0.5890
LIQ	-0.058292 (-10.24323)	0.005691	0.0000
NDTS	0.015952 (0.152940)	0.104304	0.8787
PROF	-0.024618 (-0.986338)	0.024959	0.3258
SIZE	0.047524 (4.030248)	0.011792	0.0001
TANG	-0.011660 (-0.172066)	0.067764	0.8637

Adjusted R-squared: 0.714630, R-squared: 0.772063, Prob(F-statistic): 0.00000 , F-statistic: 13.44287 , Durbin-Watson stat : 1.643076

Growth

Growth is also significant in Turkey only. The ratio represents the value of sales over total assets (Sheikh & Wang, 2011). The ratio has positive relation to leverage. The results are in line with Deesomsak et al., (2004). According to hypotheses 5 (H5), there should be a negative correlation between growth and debt. Hence the Hypotheses is rejected.

4.4.4 Results on total long term debt before crisis

Table 4.4 and 4.5 represent the results of regression by considering total long term debt before crisis in Turkey and USA.

Profitability

The ratio is statistically significant in the regression analysis in Turkey which shows that it predicts changes in total long term debt. As it is mentioned above the coefficient could be interpreted as, by a unit of change in profitability debt is likely to decrease by 0.3. The results on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder & Myers (1999), Fama & French (2002), Frank & Goyal (2005), Gaud et al., (2005). For Turkey, H3 is accepted. The results on profitability is according to the pecking order theory which states a negative relation between debt Liquidity is reported to be significant with in both countries. Interestingly the coefficient is negatively related to debt with a small value of -.0034 while in USA is -.057 with a negative relation to total debt. Since the ratio is calculated through the division of current assets and current liabilities.

Table 4.6. Total Long Term Debt before CrisisTurkey

TURKEY	Coefficient	Std. Error	Prob.
C	0.721064 (2.521679)	0.285946	0.0130
GROWTH	-0.006395 (-0.197785)	0.032332	0.8435
LIQ	0.006191 (1.118332)	0.005536	0.2656
NDTS	0.301092 (0.799146)	0.376767	0.4258
PROF	-0.300226 (-3.337870)	0.089946	0.0011
SIZE	-0.053569 (-2.326631)	0.023024	0.0216
TANG	-0.049358 (-0.585632)	0.084282	0.5592

Adjusted R-squared: 0.521121, R-squared: 0.620629 ,Prob(F-statistic): 0.000000 , F-statistic: 6.237019 , Durbin-Watson stat : 1.911454

Table 4.7. Total Long Term Debt before Crisis USA

USA	Coefficient	Std. Error	Prob.
C	-0.810692 (-2.169435)	0.373688	0.0319
GROWTH	0.006957 (0.335162)	0.020757	0.7381
LIQ	-0.000610 (-0.054537)	0.011185	0.9566
NDTS	-0.242976 (-1.185230)	0.205004	0.2381
PROF	0.004075 (0.083062)	0.049056	0.9339
SIZE	0.067046 (0.083062)	0.023176	0.0045
TANG	0.214742 (1.612335)	0.133187	0.1094

Adjusted R-squared: 0.847218, R-squared: 0.877967 ,Prob(F-statistic): 0.00000 , F-statistic: 28.55307 , Durbin-Watson stat : 1.901369

Size

The study calculated size base on the formula given by Sheikh & Wang (2011) which is the natural logarithm of sales. The ratio is considered to have a negative correlation with debt according to pecking order theory and results in USA is similar. The ratio is statistically significant with the coefficient of - 0.05. However, the coefficient is positive in Turkey which is according to trade-off theory. The result of the ratio is in line with previous studies such as (Cassar & Holmes, 2003) and (Deesomsak, et al., 2004). According to H2, the Hypotheses is rejected.

4.4.5 Results on total short term debt during and after crisis

According to the regression results this part tries to analyze how the firms adjusted their capital structure during and after financial crisis.

Liquidity

Liquidity is reported to be significant with in both countries. Interestingly the coefficient is negatively related to debt with a small value of -.0034 while in USA is -.057 with a negative relation to total debt. Since the ratio is calculated through the division of current assets and current liabilities, it could be said that, in Turkey borrowing could have negative impact on current assets where on the other hand, USA firms increased their current assets during and after financial crisis by borrowing. As Eriotis et al., (2007) stated, short term borrowing could affect the liquidity of firms during the crisis since the maturity of the debt is short term and firms may not generate enough profit to offset the debt. However, USA firms in the selected industries were able to prove the converse and actually increased their liquidity through short term borrowing. Results in Turkey are in Line with Eriotis et al., (2007) and result for USA is supported by Abdullah (2005). The results on liquidity lead to support of H4.

Table 4.8. Total Short term Debt during and after Crisis USA

USA	Coefficient	Std. Error	Prob.
C	-0.376875 (-0.880584)	0.427984	0.3816
GROWTH	-0.003275 (-0.482998)	0.006780	0.6306
LIQ	-0.034435 (-4.726467)	0.007286	0.0000
NDTS	0.108070 (0.888061)	0.121692	0.3776
PROF	0.006594 (0.179503)	0.036735	0.8581
SIZE	0.037238 (1.393024)	0.026731	0.1681
TANG	-0.223867 (-2.245839)	0.099681	0.2790

Adjusted R-squared: 0.677081, R-squared: 0.772639 ,Prob(F-statistic): 0.000000, F-statistic: 8.085584 , Durbin-Watson stat : 2.017809

Table 4.9. Total Short term Debt during and after Crisis Turkey

Turkey	Coefficient	Std. Error	Prob.
C	0.004788 (0.376637)	0.012711	0.7080
GROWTH	0.089344 (1.452529)	0.061509	0.1525
LIQ	-0.057407 (-3.540504)	0.016214	0.0009
NDTS	2.166293 (0.864455)	2.505962	0.3914
PROF	-0.219956 (-1.345077)	0.163527	0.1846
SIZE	-0.118129 (-0.920540)	0.128326	0.3616
TANG	-0.274737 (-0.749324)	0.366646	0.4571

Adjusted R-squared: 0.154900 , R-squared: 0.454429 , Prob(F-statistic): 0.097048,
F-statistic: 1.517146 , Durbin-Watson stat : 2.848552

4.4.6 Results on Total Long Term Debt during and after Crisis

Liquidity

The ratio is reported to have positive correlation to long term debt during the crisis. The coefficient is statistically significant at 5 and 10 % levels with the value of 0.019. it could be said that firms in Turkey used the long term debt to increase their liquidity and current assets. The result is in line with Michaelas et al., (1999). According to results, H4 is rejected.

Growth

The ratio is only statistically significant in USA with a positive correlation to total debt. Since the ratio is the division of total sales over total assets, perhaps USA firms used the long term debt to increase their sales. Pecking order theory suggests that the relation should be positive which is supported by the findings in this study. Previous literature such as Eriotis et al., (2007), Zou & Xiao (2000) found positive correlation between growth and debt. Results lead to rejection of H5.

Table 4.10. Total Long Term Debt during and after Crisis Turkey

Turkey	Coefficient	Std. Error	Prob.
C	-0.853688 (-0.796469)	1.071841	0.4285
GROWTH	-0.060515 (-1.425765)	0.042444	0.1584
LIQ	0.019679 (2.094922)	0.009394	0.0398
NDTS	1.342239 (0.885286)	1.516165	0.3790

Table 4.10. Total Long Term Debt during and after Crisis Turkey (continued)

PROF	-0.167929 (-1.406874)	0.119364	0.1639
SIZE	0.079098 (1.020338)	0.077521	0.3111
TANG	-0.316380 (-1.579421)	0.200314	0.1187

Adjusted R-squared: 0.609236, R-squared: 0.723702 ,Prob(F-statistic): 0.000000, F-statistic:. 6.322408 , Durbin-Watson stat : 2.002489

Table 4.11. Total Long Term Debt during and after Crisis USA

USA	Coefficient	Std. Error	Prob.
C	-0.985971 (-1.383163)	0.712838	0.1710
GROWTH	0.020068 (1.712902)	0.011716	0.0912
LIQ	0.020523 (1.631888)	0.012576	0.1072
NDTS	-0.649514 (-3.088532)	0.210299	0.0029
PROF	-0.247065 (-3.896761)	0.063403	0.0002
SIZE	0.089005 (1.995623)	0.044600	0.0499
TANG	-0.161782 (-0.952446)	0.169859	0.3441

Adjusted R-squared: 0.947931, R-squared: 0.963183 ,Prob(F-statistic): 0.000000, F-statistic:. 63.14867 , Durbin-Watson stat : 1.974588

Profitability

Profitability is only significant in USA. As it is expected from pecking order theory, the coefficient is negatively related to TLD. The results on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder & Myers (1999), Fama & French (2002), Frank & Goyal (2005), Gaud et al., (2005). Results support H3.

NDTS

NDTS is reported as statistically significant at 5 and 10% levels which could be interpreted as that by 1 unit change in NDTS, if other variables are hold fixed, long term debt decreases by 0.64. Results are in line with previous findings in other studies such as Rajan & Zingales (1995) and Jong et al. (2008). Results on NDTS cause the rejection of H6.

Size

The study have found that size is considered to have a negative correlation with debt which is according to trade-off theory and results. The ratio is statistically significant with the coefficient of 0.08. The result of the ratio is in line with previous studies such as (Cassar & Holmes, 2003) and (Deesomsak, et al., 2004). The results support H2.

4.4.7 Results on Total Debt during and after Crisis

Profitability

Profitability is statistically significant with in both countries with the coefficient of -.30 for Turkey and -0.23 for USA which could be interpreted as, by a unit of change in profitability debt is likely to decrease by 0.30 and 0.23, respectively. The results on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder & Myers (1999), Fama & French (2002), Frank &

Goyal (2005), Gaud et al., (2005). The results on profitability is according to the pecking order theory which states a negative relation between debt and profitability. According to Frank & Goyal (2005), when a firm is in profit, borrowing could effectively reduce the profitability. In other words the relation between debt and profitability is reverse in profitable firms. Hence, h3 is supported.

NDTS

NDTS is reported as statistically significant for Turkey and USA which could be interpreted as that by 1 unit change in NDTS, if other variables are hold fixed, total debt decreases by 0.57 for USA and .62 for Turkey. Results are in line with previous findings in other studies such as Rajan & Zingales (1995) and Jong et al. (2008). Hence, H6 is rejected.

Tangibility

The ratio of total fixed assets over total assets is called tangibility in this study. After regression analysis it shown that the ratio is only statistically significant in USA. According to the coefficient, the ratio is negatively related to debt which is in contradiction with the assumption of pecking order theory. However others such as Almeida and Campello (2007) found negative correlation between the two variables. Although the coefficient is negative in USA, but remains not significant in Turkey. Hence H1 is rejected.

Size

The study calculated size base on the formula given by Sheikh & Wang (2011) which is the natural logarithm of sales. The ratio is considered to have a positive correlation with debt according to trade-off theory and results in USA are reported to be in line with this theory. The ratio is statistically significant with the coefficient of

0.13. The result of the ratio is in line with previous studies such as (Cassar & Holmes, 2003) and (Deesomsak, et al., 2004). So, H2 is accepted.

Table 4.12. Total debt during and after crisis Turkey

Turkey	Coefficient	Std. Error	Prob.
C	-0.874881	1.078620	0.4201
GROWTH	0.079579	0.042712	0.2666
LIQ	-0.014091	0.009453	0.1406
NDTS	.6299034	1.525754	0.0128
PROF	-0.304587	0.120118	0.0135
SIZE	0.082866	0.078011	0.2918
TANG	-0.299619	0.201581	0.1417

Adjusted R-squared: 0.8818668, R-squared: 0.916468 ,Prob(F-statistic): 0.000000, F-statistic: 26.48274 , Durbin-Watson stat : 1.631944

Table 4.13. Total debt during and after crisis USA

USA	Coefficient	Std. Error	Prob.
C	-1.496867 (-2.121718)	0.705498	0.0374
GROWTH	0.010297 (0.888084)	0.011595	0.3775
LIQ	-0.015054 (-1.209453)	0.012447	0.2306
NDTS	-0.575589 (-2.765485)	0.208133	0.0073
PROF	-0.238969 (-3.808284)	0.062750	0.0003
SIZE	0.133193 (3.017447)	0.044141	0.0036
TANG	-0.354341 (-2.107789)	0.168110	0.0386

Adjusted R-squared: 0.903318, R-squared: 0.931639, Prob(F-statistic): 0.000000, F-statistic: 32.89586, Durbin-Watson stat : 1.531638588

4.4.8 Results on Total Debt before Crisis

Profitability

Profitability is only significant in USA. As it is expected from pecking order theory, the coefficient is negatively related to total debt. The results on profitability is in line with previous studies such as Harris & Raviv (1991), Rajan & Zingales (1995), Shyam-Sunder & Myers (1999), Fama & French (2002), Frank & Goyal (2005), Gaud et al., (2005). The results show that H3 is accepted.

Size

The ratio is considered to have a positive correlation with debt according to trade-off theory and result in USA is the same. The ratio is statistically significant with the coefficient of 0.08. The result of the ratio is in line with previous studies such as (Cassar and Holmes, 2003) and (Deesomsak et al., 2004). H2 is accepted.

Table 4.14. Total debt before crisis Turkey

TURKEY	Coefficient	Std. Error	Prob.
C	-0.002866 (-0.237504)	0.012066	0.8127
GROWTH	0.003559 (0.08992)	0.039574	0.9285
LIQ	-0.006929 (-0.657018)	0.010547	0.5126
NDTS	-0.807567 (-2.164664)	0.373068	0.0327
PROF	-0.301289 (-3.407561)	0.088418	0.0009
SIZE	-0.035552 (-0.834370)	0.042610	0.4060
TANG	-0.334595 (-3.148201)	0.106281	0.2208

Adjusted R-squared: 0.266842, R-squared: 0.437728 ,Prob(F-statistic): 0.000217 , F-statistic: 2.561516 , Durbin-Watson stat : 2.378770

Table 4.15. Total debt before crisis USA

USA	Coefficient	Std. Error	Prob.
C	-0.928532 (-2.320479)	0.400147	0.0222
TANG	0.153214 (0.846865)	0.180919	0.3989
SIZE	0.065091 (2.613750)	0.024903	0.0102
PROF	-0.024694 (-0.565282)	0.043685	0.5730
NDTS	-0.372387 (0.916056)	0.406512	0.3617
LIQ	-0.018115 (-1.320466)	0.013719	0.1894

Adjusted R-squared: 0.065984, R-squared: 0.26757 ,Prob(F-statistic): 0.014779 , F-statistic: 1.327326 , Durbin-Watson stat : 2.067441

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4.5 Discussion

Turkey

In the period of 2000- to 2012, profitability and tangibility are statistically significant and could determine the capital structure. They both have negative correlation to debt and interestingly the coefficients are not more than 0.3. Since the industries chosen for the study are tend to have a large number of asset tangibility, it is logical that the ratio of tangibility could be a determinant of debt.

Now when the short term debt is the dependent variable before financial crisis, 4 out of 6 variables are reported to be statistically significant while after the crisis only two variables are considered to have impact on debt. Liquidity and profitability are both significant before and after crisis. However, Liquidity is only significant after crisis. Since the short term debt is usually considered as the current liabilities due to the period of maturity being less than or maximum a year, it could affect the liquidity of firms in Turkey.

In terms of long term debt only two variables are statistically significant and after the crisis only one variables is. It is obvious that the financial crisis could effectively change the choice and determinants of capital structure in Turkey.

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USA

In the period of 2000- to 2012, profitability and liquidity and size are statistically significant and could determine the capital structure. All have negative correlation to debt.

When the short term debt is the dependent variable before financial crisis, 2 out of 6 variables are reported to be statistically significant while after the crisis only one variable is considered to have impact on debt. Liquidity is significant before and after crisis. However the coefficient decreases after and during crisis by 2%.

In terms of long term debt only one variable (size) is statistically significant before crisis. On the other hand during and after crisis, more variables could make changes in capital structure of firms. Growth, NDTs, profitability and size are reported to be statistically significant.

Chapter 5

CONCLUSIONS

5.1 Introduction

The current chapter tries to summarize the findings and shows their contribution to the industries and countries the study focused on. During previous chapters different methodologies were introduced and their contribution to the model chosen for the study and also the results that the study obtained were discussed. Different variables were introduced and analyzed to find out the relation of them with debt in Turkey and USA. It has been found that the specification of each time horizon could affect the determinants of leverage. There have been numerous studies done on capital structure using different theories and methodologies and yet not a unique approach which could accurately define capital structure of firms is introduced.

5.2 Summary of Findings

This study focused on effects of global financial recession on the capital structure of firms in two different countries. Variables chosen for the study are according to Ssheikh & Wang (2011) which are tangibility, size, profitability, non-debt tax shield, growth and liquidity. Furthermore the study divided the ratio of debt in to three different variables as total debt ratio, total long term ratio and short term debt ratio. All the variables are taken in to a panel structure to see whether they could determine the changes in the dependent variables. In addition, correlation analysis is implemented in Eviwes to test the Multicollinearity. Furthermore, the results also

change based on the periods. For the whole period, tangibility and profitability are calculated to cause changes in total debt in Turkey, profitability and liquidity and size are reported to cause changes in total debt for USA. Result on total short term debt and long term debt show that firms in both countries were under the effect of financial crisis. Liquidity is reported to be the most important determinant of leverage in both countries before and after crisis.

5.3 Limitations and Suggestions

The current study focused on 6 control variables where other variables such as market to book ratio and age are also reported to effect the choice of capital structure. Future studies could chose other variables and capture their effects on total debt. The period chosen for the study is 13 years. Although the period includes significant changes and interesting results in capital structure of firms, however it is suggested that a longer period could conclude to more comprehensive results. The study used panel regression which is proved to be a reliable to technique, although other models such as time series analysis could be useful. A more detailed study could divide the period in to three sub period to observe how the firms coped and recovered from the global financial crisis.

To go through more details, future studies could analyze the regression not only based on date but also with in sector categorization.

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APPENDICES

Appendix A: Turkey Unit Root Test

Panel unit root test: Summary

Series: GROWTH

Date: 03/11/14 Time: 20:34

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.46379	0.0000	20	231
Breitung t-stat	-1.76486	0.0388	20	211
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.42126	0.0003	20	231
ADF - Fisher Chi-square	75.9388	0.0005	20	231
PP - Fisher Chi-square	79.8530	0.0002	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LIQ

Date: 03/11/14 Time: 20:35

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.71364	0.0000	20	234
Breitung t-stat	-1.44249	0.0746	20	214
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.37504	0.0846	20	234
ADF - Fisher Chi-square	52.1285	0.0948	20	234
PP - Fisher Chi-square	44.4956	0.2881	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: NDTs

Date: 03/11/14 Time: 20:35

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Cross-

Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.3019	0.0000	20	226
Breitung t-stat	-2.16206	0.0153	20	206
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.69576	0.0000	20	226
ADF - Fisher Chi-square	108.101	0.0000	20	226
PP - Fisher Chi-square	116.152	0.0000	20	234

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: PROF

Date: 03/11/14 Time: 20:35

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.02308	0.0000	20	233
Breitung t-stat	-4.03182	0.0000	20	213
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.42448	0.0003	20	233
ADF - Fisher Chi-square	71.3558	0.0017	20	233
PP - Fisher Chi-square	94.9119	0.0000	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TANG

Date: 03/11/14 Time: 20:36

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.16904	0.0000	20	234
Breitung t-stat	-1.39826	0.0810	20	214
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.30277	0.3810	20	234
ADF - Fisher Chi-square	40.3831	0.4533	20	234
PP - Fisher Chi-square	29.5114	0.8884	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SIZE

Date: 03/11/14 Time: 20:36

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.85445	0.0000	20	235
Breitung t-stat	2.94408	0.9984	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.14784	0.0159	20	235
ADF - Fisher Chi-square	63.0429	0.0115	20	235
PP - Fisher Chi-square	98.1919	0.0000	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TSD

Date: 03/11/14 Time: 20:37

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.42004	0.0000	20	235
Breitung t-stat	-0.56564	0.2858	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.87000	0.0307	20	235
ADF - Fisher Chi-square	63.4399	0.0106	20	235
PP - Fisher Chi-square	63.0146	0.0116	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TD

Date: 03/11/14 Time: 20:36

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.38389	0.0000	20	230
Breitung t-stat	0.55852	0.7118	20	210
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.47717	0.0066	20	230
ADF - Fisher Chi-square	65.5041	0.0067	20	230
PP - Fisher Chi-square	41.3830	0.4101	20	239

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TLD

Date: 03/11/14 Time: 20:37

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.5643	0.0000	19	221
Breitung t-stat	-0.55568	0.2892	19	202
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.98785	0.0000	19	221
ADF - Fisher Chi-square	96.5997	0.0000	19	221
PP - Fisher Chi-square	96.8527	0.0000	19	227

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Appendix B: USA Unit Root Test

Panel unit root test: Summary

Series: GROWTH

Date: 03/11/14 Time: 20:40

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.30007	0.0000	20	238
Breitung t-stat	-0.69262	0.2443	20	218
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.75818	0.2242	20	238
ADF - Fisher Chi-square	45.0261	0.2697	20	238
PP - Fisher Chi-square	49.1694	0.1517	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LIQ

Date: 03/11/14 Time: 20:41

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.5096	0.0000	20	235
Breitung t-stat	-0.46739	0.3201	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.34320	0.0000	20	235
ADF - Fisher Chi-square	88.8584	0.0000	20	235
PP - Fisher Chi-square	99.4237	0.0000	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: PROF

Date: 03/11/14 Time: 20:41

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.05890	0.0000	20	232
Breitung t-stat	-0.75584	0.2249	20	212
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.35847	0.0872	20	232
ADF - Fisher Chi-square	52.9748	0.0821	20	232
PP - Fisher Chi-square	99.2561	0.0000	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SIZE

Date: 03/11/14 Time: 20:41

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.47054	0.0000	20	235
Breitung t-stat	1.30259	0.9036	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.91492	0.0018	20	235
ADF - Fisher Chi-square	74.4422	0.0008	20	235
PP - Fisher Chi-square	94.6737	0.0000	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: NDTS

Date: 03/11/14 Time: 20:41

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.60804	0.0002	20	233
Breitung t-stat	-3.06877	0.0011	20	213

Null: Unit root (assumes individual unit root process)

Method	Statistic	Prob.**	Cross-sections	Obs
Im, Pesaran and Shin W-stat	-1.31666	0.0940	20	233
ADF - Fisher Chi-square	56.7959	0.0412	20	233
PP - Fisher Chi-square	89.3808	0.0000	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TANG

Date: 03/11/14 Time: 20:42

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-18.1067	0.0000	20	235
Breitung t-stat	-2.13114	0.0165	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.23102	0.0000	20	235
ADF - Fisher Chi-square	83.1699	0.0001	20	235
PP - Fisher Chi-square	106.955	0.0000	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TLD

Date: 03/11/14 Time: 20:42

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.79420	0.0000	20	236
Breitung t-stat	2.79383	0.9974	20	216
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.32968	0.0918	20	236
ADF - Fisher Chi-square	61.0900	0.0175	20	236
PP - Fisher Chi-square	75.4520	0.0006	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TSD

Date: 03/11/14 Time: 20:43

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.0388	0.0000	20	235
Breitung t-stat	-2.33060	0.0099	20	215
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.7921	0.0000	20	235
ADF - Fisher Chi-square	1.9458	0.0000	20	235
PP - Fisher Chi-square	11.245	0.0000	20	238

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TD

Date: 03/11/14 Time: 20:42

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.51763	0.0000	20	238
Breitung t-stat	0.30076	0.6182	20	218
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.45652	0.3240	20	238
ADF - Fisher Chi-square	40.8762	0.4318	20	238
PP - Fisher Chi-square	46.6807	0.2169	20	240

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.