Capital Structure and Global Financial Crisis: The Case of Non-Financial Firms in Netherlands

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ABSTRACT

This study aims to run an empirical analysis on the capital structure of firms included in one of the most important indices, EURONEXT NV in the Netherlands. The firms are ranked by their market capitalization in 2012. The overall period chosen for this study is 8 years from 2004 to 2011. It also investigates the important period of global financial crisis in 2008. Several theories are used here to realize the capital structure of firms in Netherlands. Since the data is a merge of time series and cross sections, in terms of methodology, panel data is used. The dependent variables are total debt, short term debt and long term ratio. Independent variables are profitability, liquidity, non-debt tax shield, size and tangibility. Regression results state that, profitability had negative relationship, while size and tangibility could positively influence the total debt ratio before crisis. On the other hand, during the crisis growth and liquidity reported to have positive relationship, while profitability had negative impact on total debt ratio. In terms of long term debt ratio before crisis size, tangibility and growth had positive effect, whereas during crisis growth, liquidity, size and tangibility had positive effect, and profitability had negative impact on total long term debt ratio. Before crisis profitability and liquidity were negatively correlated to short term debt, while after crisis size, tangibility positively, non-debt tax shield and liquidity negatively affected the short term debt ratio. This study has clearly shown that selected firms preferred to use long term debt rather than short term debt during those years. Also, it states that especially liquidity has become an important variable for leverage after the crisis.

Keywords: Capital Structure, Global Financial crisis, Liquidity

ÖZ

Bu çalışmanın en önemli endekslerinden biri, Hollanda'da EURONEXT NV firmaları da olmak üzere sermaye yapısı ampirik analizini amaçlamaktadır. Firmalar 2012 yılında kendi piyasası tarafından sıralanır. Bu çalışma için seçilen genel yılları 2004-2011 toplam 8 yıldır. Ayrıca 2008 yılında küresel mali krizin önemli dönemi incelenir. Çeşitli teoriler Hollanda'da firmaların sermaye yapısı gerçekleştirmek için burada kullanılır. Veri metodolojisi açısından, zaman serisi ve kesitleri bir birleştirme olduğu için, panel verileri kullanılır. Bağımlı değişken toplam borç, kısa vadeli borç ve uzun vadeli oranıdır. Bağımsız değişkenler karlılık, likit, borç dışı vergi kalkanı, boyut ve somutluk vardır. Regresyon sonuçları boyutu ve somutluk olumlu kriz öncesi toplam borç oranı etkileyebilecek iken, karlılık, negatif bir ilişki olduğunu ifade edilmektedir. Karlılık toplam borç oranı üzerinde olumsuz etkisi vardı Öte yandan, krizin büyüme ve likit sırasında, pozitif bir ilişki olduğu bildirilmiştir. Kriz büyüme sırasında, likit, boyut ve somutluk olumlu etkisi vardı, ve karlılık toplam uzun vadeli borç oranı üzerinde olumsuz etkisi oldu ise uzun vadeli borç oranı açısından kriz boyutu önce, somutluk ve büyüme, olumlu etkilemiştir Kriz boyutu sonra, somutluk olumlu, borç dışı vergi kalkanı ve likit olumsuz kısa vadeli borç oranı etkilenen ise kriz kârlılığı ve likitsine olumsuz, kısa vadeli borçların korelasyon öncesidir. Bu çalışma açıkça seçilen firmaların o yıllarda oldukça kısa vadeli borç daha uzun vadeli borç kullanımı tercih olduğunu göstermiştir. Ayrıca, özellikle likit krizi sonrasında kaldıraç için önemli bir değişken haline geldiğini belirtiyor.

Anahtar Kelimeler: Sermaye Yapısı, Küresel Mali kriz, Likit

To My Family

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Chapter 1

INTRODUCTION

1.1 Background

In 1958, Modigliani and Miller published a paper on the basis of capital structure and investment theory. Enormous studies have been done afterwards by this aim to come to a point where a theory is capable to study, evaluate, and also criticize a firm's capital structure. Among those theories the most famous ones are, the agency theory described by (Jensen & Meckling, 1976), the trade-off theory described by Modigliani & Miller (Modigliani & Miller, 1963) and the pecking order theory described by Myers & Majluf (Myers & Majluf, 1984), all with the aim at explaining firms' capital structure. The usual procedure in firms in all around the world states that the management should be separated from the ownership. In other words, controlling the firm and being a shareholder should be separated. Managers should make the shareholders confident of the results of their activities which result in one single goal, maximizing the shareholders' wealth. However, it would not always happen. There are a lot of cases where managers only preferred their own interest. It is very likely to happen when managers are not responsible enough, and they decide to undertake strategies which move toward their own benefit without considering shareholders. Although the problem could cause unaffordable costs, there are some techniques to control them and their actions. Debt could motivate the management to pursue the companies and shareholders' interest.

There have been an abundant number of studies done on the capital structure theories since 1958 which was the first idea developed by Modigliani & Miller. Since then, all studies in this subject have been trying to fully evaluate the most important determinants which are directly affecting the capital structure of firms.

Harris and Raviv (1991) indicate that empirical researches are needed to find the different aspects of capital structure. So far, the main focus of these studies has been on the developed countries. To have more idea about models in capital structure, Rajan and Zingales (1995) tried to realize if those elements which are affecting the capital structures in firms in different countries, are the same as those which are affecting the firms' capital structure in U.S. They used tangibility, growth, firm size and profitability of firms to evaluate the impact of those variables on leverage.

It is clear that, there have not been many researches which included developing countries to realize the determinants affecting it and also to evaluate the applicability of the mentioned theories. It has to be mentioned that accordingly a few studies are done by Booth et al., (2001), Abor (2005), Agboola & Salawu (2008), and Heng & Tze-san (2011) on the matter of developing countries.

1.2 Statement of the Problem

This study decides to test the determinants of capital structure, and the possible relationship they have with the performance of firms listed on the Netherlands' stock market. It also tries to find out if debt or equity has been chosen as the choice of capital structure. The study uses non-financial firms which were selected from 4 different sectors, and aims at identifying the effects of financial crisis on their capital structure decision from 2004 to 2011.

1.3 Research Questions

This study has two research questions to be answered:

1. What are the factors which determine capital structure of firms listed in EURONEXT N.V?

2. Has the global financial crisis of 2008 affected the firms' decision on capital structure?

1.4 Motivation

This study has chosen the Netherlands since it has one of the oldest stock exchange markets in the world, Amsterdam Stock Exchange. One motivation is the fact that not many studies have focused on the firms in the Netherlands solely. Another motivating factor is to understand whether global financial crisis has affected the capital structure or not. The more important reason is the period that this study has chosen from 2004 to 2011. Thus the intention of the study is to focus on this period, especially while the global crisis of 2008 has been going on in Europe.

1.5 Limitation of the Study

This study selected 12 firms in 4 different industries which are publically traded on EURONEXT NV, in Amsterdam, the Netherlands. Of course, the selected firms are leading and the representative of their own industry, but it would have been more reliable if the focus was broader. On the other hand, all the needed data is collected from the usual sources such as annual reports of firms supplied by Data Stream.

1.6 Proposed Structure

This study is composed of following sections:

After the introduction chapter (1), the second chapter outlines a review of the existing literature on the basis of previous studies done by the subject of capital structure and its determinants.

The third chapter deals with the research methodology. The same chapter presents the data, variables and research questions used for this study. The hypotheses and model developed for the study are also included in this chapter.

The fourth chapter provides an interpretation of empirical results and discuss about findings followed by the limitations.

The fifth chapter brings conclusion and puts forward recommendations to further research.

Chapter 2

LITERATURE REVIEW

Every organization needs to have a proper decision in choosing optimal capital structure which could consequently lead to maximize their value under a good management. It must be considered that a wrong decision in balancing debt and equity, may lead in financial distress or even bankruptcy (Sheikh and Wang, 2011). They stated that alternative capital structure models have been presented because of the need for a right mixture of debt and equity, but an optimal level of debt has not been determined yet. Sheikh and Wang (2011) mention that this could be imputed as the theories express different views in their focus about capital structure. For developed countries, many studies have been assessed regarding the capital structure, but only a few researches have been evaluated the developing countries. Chen (2004) explains that during recent years, different researches taken place internationally. Supporting by Rajan & Zingales (1995), who worked on US firms (Mouamer 2011). This chapter covers different theories of capital structure, their determinants, and also presents the relationship that each of those variables have with the theories. The capital structure is a mixture of debt and equity that companies use to invest. Bos and Fetherston (1993) describe the capital structure as total debts over total assets, which impresses the profitability and also risk of companies. Accordingly, firms can change their structure by increasing or decreasing the debt to equity ratio. They can either issue debt or equity, but this scenario must lead to maximize the firm value, and finally to increase the wealth of shareholders.

2.1   Theoretical Framework

The capital structure theories basically focus on financing behavior of firms, and also the strategy they use to choose between debt and equity (Myers, 2002). Accordingly, studies have been done to demonstrate these behaviors by using various models which could not present an absolute theory yet. However, there are some relevant theories which can improve decision making in choosing debt and equity. The most famous ones among those theories are the most famous ones are Trade-off theory, Pecking order theory, Agency theory, and also signaling theory.

2.1.1   Modigliani and Miller Propositions

Theories and the framework introduced by Modigliani and Miller (MM) have always been the most effective researches in the capital structure. The prepositions given by these two economists gave birth to discussion about the literatures of corporate finance, and also improved empirical studies done afterward. The theories mainly express that the value of a firm would not be influenced by its financial decisions. According to Prasad et al., (2001), the MM theory focuses on the traditional view which defines debt to be less expensive than the equity. On the other hand, Titman (2002) state that increasing debt does not hold an acceptable outcome, and would also increases the probability of default resulting in bankruptcy. There are different propositions concluded by MM theory. Proposition I states that the capital structure would stay unchanged, even if firms value changes (Constantinides, 2003). According to Myers (2002), the amount of leverage is irrelative, so it is not important whether debt is in euros or dollars, straight or convertible, long term or short term, call protected or callable. Proposition II illustrates that as the ratio of debt to equity increases, shareholders' required rate of return also increases linearly

(Prasad et al., 2001). Under this assumption, firms should not replace cheap debt for costly equity, as the accrued interest will be offset by the cost of equity (Myers, 2002). To sum up, the MM theory indicates that there are some factors such as financial distress or taxes which cause capital structure to be imperfect. Other theories also mentioned that imperfections of market such as asymmetric information or agency problems would increase this weakness.

2.1.2 The Trade-off Theory

This theory states that, firms are subjected to an increase in their marginal costs of debts and decrease in marginal benefit of debt. It seems, they trace a specific debt to equity ratio and move toward it. Hence, firms would have to borrow until the point that marginal costs of bankruptcy do offset the marginal tax benefit. This indicates that there exists an optimal way to maximize the firm value (Myers, 1984). This theory also holds some facts, as an example, firms with intangible assets which are also risky, borrow less than those with comparatively safe tangible assets. The market value of a firm is not aligned with its capital structure. Meanwhile, it would not change whether the firms borrow or shareholders, as there is no tax and capital market are working well (Miller and Modigliani, 1958). Smith & Watts (1992) suggest that firms borrow less today if they expect their future investments to have much profit. For a firm, as it faces with bankruptcy, growth and profit opportunities will be decreased, and also issuing new risky debt would diminish its interest in future investment. Raviv (1991) says that the amount of borrowed funds used in large companies with higher tangible assets seems to be more than small and relatively risky companies with intangible assets. Although studies indicate that to have a higher profitability firms need to hold lower debts, trade-off theory suggests

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that if companies could have a proper tax shield while they will have higher profitability, they would have greater taxable income to shield. As a result, they would carry less financial risk if they borrow more.

2.1.3 The Pecking Order Theory

This theory is transpired based on the problems which appear due to asymmetric information (Myers and Majluf, 1984). It explains that, the announcement of new issues will affect stock prices and causes undesired changes. This can hold potential costs, such as asymmetry costs and transaction costs. Thus, firms are more into holding a surprisingly large amount of cash reserves and do internal financing. In case of need for external financing, issuing debt is preferred to equity. It may cause equity to become very expensive and lead firms to invest insufficient resources. These problems do not affect the Retained earnings. Moreover, as a fixed payment of interest is required for debt, it is less sensitive to asymmetric information. This theory declares that there is no optimal capital structure, and firms prefer to do internal financing. If external financing is needed, firms will issue debt rather than equity. Managers have much more information about their firm's outlook, its opportunities and the value of the assets, than other investors. On the other hand, they act in their shareholders' interest, so that firms would waive projects with positive NPV just because they have to issue an undervalued equity to new investors (Myers and Majluf, 1984).

2.1.4 The Agency Theory

Agency costs rise from the separation of ownership and management which substantially results in conflict between managers and the shareholders. Jensen

(1986) believes that these costs are also known as the free cash flow problem. He argues that having an excess amount of cash may increase the managers' temptation to overinvest and move toward their own benefits. Therefore, firms can limit the managers by increasing leverage, even if the internal funds be available (Jensen, 1986). On the other hand, agency theory is implicated as the probable conflict of interest which may happen between shareholders and the bondholders (Jensen and Meckling, 1976). Equity-holders have lower priority on claims than Debt-holders, and also they can either invest in riskier projects. Myers (1977) notes that the problem of under-investment is exclusively stronger for mature companies, as it will cause them to defer good investment opportunities. However, Grossman and Hart (1988) suggest that using short term debts can improve the problem of under-investment in a way that both management and shareholders could get benefit.

2.1.5 The Signaling Theory

Signaling theory is basically relevant with reducing asymmetric information between two parties. This theory illustrates the problem of information asymmetries that cause companies to refuse to invest in low risk projects through the choice of capital structure. According to the model shown by Ross (1977), information about firm value can be transmitted and affects other investors. He believes that greater amount of leverage, could be a sign of higher cash flows and future profitability to investors. Moreover, firms state that they are able to acquit future interest expenses. Hence, firms may agree to increase their debt levels to have a positive signal about their future profitability to the market. There have been many studies that tested the reliability of capital structure, and subsequently provided a better understanding of firms' behavior, but despite of great development in economies, no accordance has

been acquired yet. The reason behind may be that these theories relies on different characteristic. Hence, there is not a unit theory to help a correct choice between debt and equity (Myers, 2001). However, an efficient procedure in choosing the capital structure must be applied (Myers, 1984). Different properties introduced to specify the capital structure of firms. Sheikh and Wang (2011) determine the following characteristics that can influence the financing decision of firms: growth, liquidity, profitability, asset tangibility, size, non-debt tax shield. In the following part, the determinants of capital structure will be briefly discussed.

2.2 Determinants of Leverage

2.2.1 Overview

According to Myers and Majluf (1984), there is an apparent relation between the collateral value of assets and leverage. They state that firms may prefer to sell secured debt in order to decrease the asymmetric information. Firms having a large non-debt tax shield may have a less incentive to benefit from tax advantages of debt (DeAnglo and Masulis, 1980). Similarly, pecking order theory says that firms with higher profit would have a lower amount of debt as they tend to invest internal funds (Myers, 1984). Consequently, they would undertake less leverage, and may ignore future investment opportunities (Myers, 1977). Hence, such firms would be expected to have lower leverage. Titman and Wessels (1988) find that profitability and debt are negatively related to each other. Also, they mentioned that there is not a certain relationship between firms' leverage and growth and or non-debt tax shield. Contrariwise, Harris and Raviv (1991) did a survey which indicates that firm's debt

level has a positive relationship with size, asset tangibility and also non-debt tax shield.

2.2.2 Growth

There is an obscure relationship between growth and leverage. Based on trade-off theory, firms having more intangible assets with better growth opportunities will borrow less than firms holding more tangible assets. The negative relation between the leverage and firm's growth, that causes firms to hold lower debt, can also restrict agency conflicts. There have been many studies confirmed that a relationship such as Eriotis et al. (2007) and Zou and Xiao (2006). Green et al. (2001) believe that one reason behind this negative relationship between leverage and growth is that firms do not separate long-term and short-term debt. Accordingly, Green et al. (2001) suggest that this problem can be solved by issuing short-term debt issues, and this will make a positive relationship. On the other hand, Michaelas et al. (1999) and (Abor, 2008) stated a negative relationship between growth and long-term debt. Firms may prefer internal financing rather than increasing their leverage as it can ignore future possible opportunities (Myers, 1977). According to the model represented by and Jensen and Meckling (1976), shareholders in a levered firm have tendency to divert bondholders' wealth. Alternatively, due to a high level of debt, firms may face with an increased cost of financial distress (Fama and French, 1992).

2.2.3 Liquidity

As it is explained by trade-off theory, liquidity ratio and the debt ratio of firms are expected to have both positive and negative relationship. On one hand, it states that firms having more liquidity may prefer to finance their internal funds rather than leverage, showing negative relation.

On the other hand, this theory states that firms having higher liquidity should borrow more to deal with their obligations. Sheikh and Wang (2011) mentioned that liquidity ratio includes ambiguous signals to outsiders, so that some investors may consider high liquidity as a sign of disability to invest in long-run. In contrast, it signals a safe opportunity to invest with having a low probability of default by firms. Antoniou (2008) and Mazur (2007) mentioned that the relationship between leverage and liquidity would be negative, so that firms having more liquid assets may issue less debt securities and use their internal return instead to perform their businesses. Abdullah (2005) expressed that there would be a significant negative relationship between short term debt and liquidity.

2.2.4 Tax shields (NDTS)

Capital structure decision has mixed relationship between total debt and NDTS. Titman and Wessels (1988) reported that there is not an obvious interaction between firm's leverage and NDTS. Wald (1999) suggests that leverage and NDTS are negatively correlated. This finding is also aligned with Viviani (2008) that showed a negative relationship between these two variables. As DeAngelo and Masulis (1980) suggest, those firms with higher non-debt tax shield are supposed to employ a lower level of debt which will also affect the interest payments. Thus, the relationship between NDTS and debt would be negative.

Prasad et al, (2001) state that as the interest expense is tax deductible, firms can benefit from paying their taxes and also minimize their debt levels. Furthermore, Pindado (2001) and Viviani (2008) suggested NDTS can be substitute for interest tax shield.

2.2.5 Profitability

In accordance with pecking order theory, Myers and Majluf (1984) determined leverage and profitability to have the most certain. They stated a negative relation between leverage and profitability, so that profitable firms are less interested in using external funds. Firms must consider that issuing new securities would be costly as the other investors have some information about them. Thus, they may prefer to fund investments by using their internal earnings. This negative relationship has been presented by many studies such as Rajan and Zingales (1995); Bauer (2004); Gaud et al., (2005); Viviani (2008); Rogao 2009; Kayo and Kimura 2011. In line with this viewpoint, Schoubben and Hulle (2004) suggest that profitable firms may tend to use less leverage in order to maintain their profits, and also to show more quality. On the other hand, there is less asymmetric information regarding the debt compared to equity, because holders of debt are prior to holders of equity in receiving regular payments. Hence, firms issue leverage rather than equity.

2.2.6 Size

Many studies have been done which considered firm size as an important determinant of capital structure. According to trade-off theory, larger firms may issue more debt as they face less costs of financial distress. It shows that firm size and leverage are positively correlated to each other. Rajan and Zingales (1995) show a positive correlation between debt and the size for all G-7 countries, and only for Germany reported to be negative. Wald (1999) determined positive correlation between leverage and the firm size. To support these views, Wiwattanakantang (1999) explains that larger firms have more access to credit markets and consequently they would have higher debt compared to smaller ones. In contrast, a

negative correlation has been reported by the pecking order theory, as result of asymmetric information. Meanwhile, Rajan and Zingales (1995) discuss such problems are less for larger firms' managers and other investors.

2.2.7 Asset Tangibility

It is explained by Rajan and Zingales (1995) that tangibility of asset points to the effects of collateral value of firm's asset on their leverage. According to Myers and Majluf (1984), tangibility and leverage are expected to have a positive relationship. They stated that firms by issuing secured debt may be able to decrease information asymmetries otherwise it would be costly for them as other investors have information about it. Mouamer (2011) said that firms by issuing debt will act to motivate shareholders to participate in risky investment which results in higher return. Harris and Raviv (1991) and also Rajan and Zingales (1995) have illustrated that tangibility and leverage are positively correlated.

In contrast, Titman and Wessle (1988) argue that this relationship would be negative as some managers may consume more than the optimal level they are allowed. This finding is supported by Booth et al. (2001) which illustrated a negative relationship between leverage and tangibility based on the study done on firms in Turkey, India, Brazil and Pakistan.

Several studies have emphasized on this negative relationship (Ferri and Jones, 1979; Mazur, 2007; Karadeniz et al., 2009). It could be said that the interest conflict between shareholders and bondholders would decrease if firms issue secured debt rather than assets.

2.3 Capital Structure in Netherlands

This study tries to focus on the factors that play important role in capital structure of Dutch firms. According to previous studies, among the credit suppliers, Banks are the most important one in the Netherlands, so the banking system in this country is highly concentrated (Chen, Lensink, & Sterken, 2004). They stated that their results on capital structure and financing behavior of Dutch firms were supported by basic theories such as pecking order and trade-off theory. Oolderink (2013) found a low correlation between different firm-specific determinants of capital structure such as non-debt tax shield and debt-to-capital ratio of firms, which is also supported by literature on Dutch firms. Moreover, results of this study showed negative relationship between liquidity and leverage, while size and leverage have been positively correlated. Accordingly, large firms have shown lower bankruptcy costs and risks.

Chapter 3

DATA AND METHODOLOGY

3.1 Data Source

The sample data used in this study have been chosen randomly from different sectors listed on EURONEXT NV which are publically traded. EURONEXT NV is an electronic based stock exchange which is located in Amsterdam, the Netherlands. It includes firms which are traded in countries like UK, France, Portugal, Belgium and Netherlands. The common currency in this stock exchange is Euro. On April 4, 2007 it merged with NYSE group, Inc. to form NYSE Euronext, the first global stock exchange. The total market capitalization of this stock exchange is reported to be 2.93 Trillion US dollars in 2010. This stock exchange contains other indices such as AEX index, CAC 40 and Euro Stoxx 50. To retrieve the data needed to calculate the determined variables, this study has used Data Stream which is represented by Thomson and Reuters. Balance sheet and income statements of each firm have been used to calculate the ratios needed. To understand the determinants of capital structure in firms, this study needed to find out the ratio of debt, growth, profitability, liquidity, non-debt tax shield, size and tangibility. So data stream was needed to retrieve the most reliable data in order to achieve better results. For practical analysis, the mentioned data was used and retrieved from the station provided by Department of Banking and Finance at Eastern Mediterranean University. On the other hand, this study was in need of theoretical and empirical

evidence. All the needed articles and papers have been downloaded from the online

data base of the mentioned university.

3.2 Sample of the Study

Although this study does not cover whole firms included in EURONEXT NV, but by

choosing the sample firms, it tries to represent a schema of the determinants of

capital structure in the prospect country and index. The sample of this study was

chosen from 4 different sectors, each consisting 3 firms, whose are located in

Netherlands (Appendix A). In total, 12 firms (see, Table 1) were chosen based on

their market capitalization in 2012. They are currently active in sectors including

Food Producers & Processors, Support & services, Construction and Industry.

Table 1. List of Sectors

NO	sectors	firms
1	Food Producers & Processors	1. CSM 2. Nutreco 3. Unilever
2	Support & services	1. Fugro 2. Randstad 3. USG People
3	Construction	1. Arcadis 2. BAM Grp 3. Boskalis
4	Information& Technology	1. TomTom 2. ASML 3. Gemalto

3.3 Variables

To calculate the determinants of capital structure it is common to use important ratios for each firm. This study has chosen 7 different ratios which are separately calculated for each firm and period. As it has been mentioned, this study tries to analyze these ratios in 2 different concepts.

- Before crisis; form 2004 to 2007

- After crisis; from 2008 to 2011

The ratios of this study are almost the same as other studies done by researches during the past years in different countries and sectors. For instance, Sheikh and Wang (2011) worked on determinants of capital structure in Pakistan, Jiang and Chen (2001) with the case of Dutch capital structure and Viviani (2008) focused on capital structure of French companies.

3.3.1 Dependent Variables

All of these three ratios have been retrieved from balance sheet of each firm.

1) Total debt ratio (TD), which is one of the most important ratios in all firms. It has been calculated by the division of total debt over total assets.

2) Short term debt ratio (STD), which is one of the most important ratios in all firms. It has been calculated by the division of total short term debt over total assets.

3) Long term debt ratio (LTD), which is one of the most important ratios in all firms. It has been calculated by the division of total long term debt over total assets.

3.3.2 Independent Variables

1) Growth (GROW *it*) ratio which is the ratio of sales growth to total assets. Both of these values have been retrieved from balance sheet and income statements of each firm. This ratio is expected to have negative relationship with total debt ratio.

2) Non Debt Tax Shield (NDTS *it*) ratio which is the ratio of depreciation to total assets. Both of these values have been retrieved from balance sheet and income statements of each firm. It is expected to see a negative relationship between NDTS and total debt ratio.

3) Profitability (PROF *it*) ratio which is the ratio of net profit before taxes to total assets. Both of these values have been retrieved from balance sheet and income statements of each firm. Profitability is expected to be negatively correlated with total debt ratio.

4) Liquidity (LIQ *it*) ratio is calculated by dividing current assets to current liabilities. Both of these numbers have been retrieved from balance sheet of each firm. The relationship between liquidity and debt ratio is supposed to be negative.

5) Ratio of size (SIZE *it*) which is calculated by taking natural logarithm of sales. This ratio is supposed to be positively correlated with debt.

6) Tangibility (TANG *it*) which is calculated by dividing Net fixed assets to total assets. Both of these numbers have been retrieved from balance

sheet of each firm. Tangibility and debt are expected to have positive relationship.

Table 2. Ratio Formulas

Ratio	FORMULA
TOTAL DEBT	Total debt over total assets
GROWTH	Sales growth to total assets
NDTS	Depreciation to total assets
PROFITABILITY	Net profit before taxes to total assets
LIQUIDITY	Current assets to current liabilities
SIZE	Natural logarithm of sales
TANGIBILITY	Net fixed assets to total assets
SHORT TERM DEBT	Total short term debt over total assets
LONG TERM DEBT	Total long term debt over total assets

3.4 Research Methodology

In the previous chapter the theories related to capital structure, determinants have been described vastly. Variables, hypotheses and the model used for the study will be explained respectively in the following parts. The methodology used in this study is similar to the model by Sheikh and Wang (2011). He studied the factors that affect the capital structure of manufacturing firms in Pakistan.

Pooled panel ordinary least squares (OLS) regression model is also employed to study the relationship between the different determinants of capital structure such as debt, firm size, growth, liquidity, asset tangibility and profitability.

3.5 Descriptive Statistics

There are several software and methods to calculate descriptive analysis. This study has used Eviews since it is considered to be one of the most reliable softwares in statistics. The results are as follows:

Table 3. Descriptive Analysis 2004-2011

	N	Min	Max	Mean	Std. Dev
TOTAL DEBT	96	0.008673	0.496356	0.228046	0.118704
LONG TERM DEBT	96	0.000000	0.341399	0.170583	0.089624
SHORT TERM DEBT	96	0.000000	0.280482	0.057463	0.059401
GROWTH	96	-0.441500	1.405773	0.124791	0.247634
LIQUIDITY	96	0.021606	3.285876	1.298483	0.631578
NDTS	96	0.014266	0.083291	0.038181	0.016499
PROFITABLITY	96	-0.075630	0.812410	0.113987	0.156001
SIZE (Ln)	96	13.55247	17.65425	15.05923	1.019767
TANGABILITY	96	0.021170	3.298336	0.333134	0.515620

As it is shown in Table 3, the mean for total debt is 0.228 which implies, according to the ratio, only 22 % of the assets of the selected firms are financed by debt and the other 78% is financed by other financing options such as equity.

The most significant number is the size with a mean of 15.05. The other significant ratio is liquidity by having Mean of 1.2984. This implies that the current assets of the selected firms are more than the current liabilities.

3.5.1 Descriptive Statistics before Crisis

Table below shows the descriptive analysis before financial crisis, 2004-2007.

Table 4. Descriptive before Crisis

	N	Min	Max	Mean	Std. Dev
TOTAL DEBT	48	0.008673	0.496356	0.224015	0.131938
LONG TERM DEBT	48	0.000000	0.269215	0.153957	0.088019
SHORT TERM DEBT	48	0.000307	0.280482	0.070057	0.052765
GROWTH	48	-0.441500	1.364300	0.130266	0.252575
LIQUIDITY	48	0.021606	3.285876	1.191255	0.700887
NDTS	48	0.014673	0.083291	0.040305	0.018260
PROFITABLITY	48	-0.026536	0.812410	0.114942	0.146840
SIZE (Ln)	48	13.55247	17.50905	14.89235	1.062180
TANGABILITY	48	0.030198	3.298336	0.479041	0.688715

Before crisis from 2004 and 2007, the mean for total long term is about 15.3 % which is twice as much as short term debt. The mean of total debt ratio is 22%. It implies that 22% of the financing is provided by debt and the other 78% by other financing options. The most significant number is the size with a mean of 14.89.

3.5.2 Descriptive Statistics after Crisis

Table below shows the descriptive analysis after financial crisis, 2008-2011.

Table 5. Descriptive after Crisis

	N	Min	Max	Mean	Std. Dev
TOTAL DEBT	48	0.008930	0.456092	0.232078	0.105072
LONG TERM DEBT	48	0.002448	0.341399	0.187209	0.089016
SHORT TERM DEBT	48	0.000000	0.136756	0.044869	0.041511
GROWTH	48	-0.179158	1.405773	0.119316	0.245142
LIQUIDITY	48	0.666141	2.948648	1.405710	0.539945
NDTS	48	0.014266	0.078486	0.036056	0.014408
PROFITABLITY	48	-0.075630	0.794701	0.113032	0.166212
SIZE (Ln)	48	14.15550	17.65425	15.22611	0.957532
TANGABILITY	48	0.021170	0.507064	0.187227	0.139903

After crisis from 2008 and 2011, the mean for long term debt is about 18.7 % which is greater than short term debt ratio.

The mean of total debt ratio is 0.232078. It implies that 23% of the financing is provided by debt and the other 77% by equity or other financing options. The most significant number is the size. Since the companies are chosen from industries which are highly dependent on their size and sales the mean of 15.22.

As it is shown in table 4, for years before financial crisis the mean of short term debt is reported as 7%, and for long term debt reported as 15% which is more than twice.

According to table 5, the amount of short term debt is about 4.4% and amount of long term debt is 18.7%. These changes compared to table 4, indicate that firms during financial crisis were decided to increase their long term and decrease their short term debt.

The findings in this study are against of the study done for Netherlands, UK and Belgium (Hall et al., 2004). Also according to the study by Abor (2008), long term debt is about three times less than short term debt.

3.6 Sectorial Descriptive Analysis

As it has been mentioned before, this study selected 4 sectors randomly which are currently traded in the Netherlands. In this part a comparison between the variables in sectors will be done separately based on the reported descriptive analysis of before-2004 to 2007- and after crisis-2008 to 2011.

Table 6. Sectorial Descriptive Analysis

	Info & Tech (3 firms)		Support& Services (3 firms)		Construction (3 firms)		Food & Processor (3 firms)	
Year	Before	After	Before	After	Before	After	Before	After
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Total debt	0.20700	0.1775	0.281109	0.265660	0.152658	0.2421	0.255291	0.2429
LTD	0.14101	0.1395	0.179042	0.212003	0.117882	0.2003	0.177886	0.1969
STD	0.06598	0.0380	0.102067	0.053657	0.034775	0.0417	0.077406	0.0460
Growth	0.20166	0.1148	0.126526	0.178298	0.195639	0.1211	-0.00276	0.0630
Liquidity	1.27934	1.9888	1.112855	1.161564	1.124374	1.1784	1.248442	1.2940
NDTS	0.04344	0.0382	0.041836	0.045405	0.040033	0.0298	0.035904	0.03076
Profitability	0.21012	0.2600	0.106469	0.051390	0.069433	0.0622	0.073748	0.0784
Size(Ln)	14.2797	14.585	14.86870	15.37013	14.63100	15.017	15.78990	15.931
Tangibility	0.91585	0.1853	0.562695	0.157364	0.216438	0.1857	0.221182	0.2204

According to table 6, a brief summary of all sectors will be as follows:

As it is stated in descriptive analysis, decrease in tangibility may be one of the sources of increase in liquidity. Food producers & processors and manufacturing are the two outstanding sectors. Regarding the food and processors, selected firms have not changed much due to the crisis as this sector is a non-traded one which supplies basic needs and necessities.

Information and technology sector shows that profit has increased after the crisis. This indicates that chosen firms are competitive and recovered the crisis fast. Also regarding the level of debt ratio, results show that there was an increase in total debt ratio for construction sector during the crisis, while it decreased in food producers & processors, support & services, and information & technology during the financial crisis.

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One of the interesting changes during the crisis is liquidity which has been increased in all sectors, and decrease in tangibility is expected to be one source of these changes.

3.7 Research Question

Based on the aim and objective of the study, these two following research questions have been formulated. is on capital structure of non-financial firms, there are two questions that should be answered:

1. What are the factors which determine capital structure of firms listed in EURONEXT N.V?
2. Has the global financial crisis of 2008 affected the firms' decision on capital structure?

3.8 Hypotheses

The following hypotheses are considered to be alternative.

3.8.1 Hypotheses for Research Question 1

H1. Growth, liquidity, NDTS, profit, size, tang, are determinants of short term debt.

H1. Growth, liquidity, NDTS, profit, size, tang, are determinants of long term debt.

H1. Growth, liquidity, NDTS, profit, size, tang, are determinants of total debt.

3.8.2 Hypotheses for Research Question 2

H1. The global financial crisis has affected the capital structure of firms.

3.9 Model

This study uses multiple linear regression formula to achieve its goal. The model chosen for the study is as follows:

$$\text{Dep}_{it} = \alpha + \beta\text{Indep}_{it} + \mu_{it} \tag{1}$$

The mentioned formula is the representative of OLS regression which has been regressed in Eviews. The subscript i represents the cross-sectional dimension and t represents the time-series dimension. The left side of the equation-Dep_{it}, shows the dependent variable. On the right side of the equation, α is the constant, β represents the coefficients, Indep_{it} relates to all other independent variables, and μ_{it} stands for a random term. As it has been said earlier this study uses 3 different dependent variables: Debt ratio, Short Term Debt ratio and Long Term Debt Ratio. Equations for these variables are as follow:

$$\text{TD}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROF}_{it} + \beta 4\text{NDTS}_{it}$$
$$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it} \tag{2}$$

$$\text{STD}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROF}_{it} + \beta 4\text{NDTS}_{it}$$
$$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it} \tag{3}$$

$$\text{LTD}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROF}_{it} + \beta 4\text{NDTS}_{it}$$
$$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it} \tag{4}$$

Where:

TD $_{it}$ = total debt ratio of firm i at time t.

STD $_{it}$ = short term debt ratio of firm i at time t.

LTD $_{it}$ = long term debt ratio of firm i at time t.

GROW $_{it}$ = growth opportunities of firm i at time t.

LIQ $_{it}$ = current ratio of firm i at time t.

PROF $_{it}$ = profitability of firm i at time t.

NDTS $_{it}$ = non-debt tax shields of firm i at time t.

SIZE $_{it}$ = size of firm i at time t.

TANG $_{it}$ = tangibility of firm i at time t.

$\beta 0$ = common intercept.

$\beta 1 - \beta 7$ = coefficients of the concerned explanatory variables.

As it has been explained before, for each independent variable there is a negative or positive relationship with leverage. These relations may change according to various theories done on different aspects of capital structure.

As it is shown in table 7, the relationship between leverage and its determinants might be either negative or positive.

Table 7. Relationships between Leverage and its Determinants

	Theoretical Expectation	Empirical Results and studies
Growth	+/-	-
Liquidity	+/-	-
Non-debt tax shield	-	-
Profitability	+/-	-
Size	+	+
Tangibility	+	+

Note: "+ " means that leverage increases with the factor."-" means that leverage decreases with the factor.

"+/-" means that both positive and negative relations between leverage and the factor are possible

The empirical results are supported by studies which have been done on capital structure of different countries. Below is a summary of sources used to construct table 7. They are classified as:

- G7 countries: (Rajan & Zingales, 1995)

- Developed Counries: (Harris & Raviv, 1991); (Bradley, et al., 1984); (Friend & Hasbrouck, 1988); (Friend & Lang, 1988); (Gonedes, et al., 1988); (Long & Malitz, 1985); (Kester, 1986); (Kim & Sorensen, 1986); (Marsh, 1982); (Titman & Wessels, 1988)

- Developing countries: (Booth et al., 2001)

Chapter 4

CAPITAL STRUCTURE IN NETHERLANDS:

EMPIRICAL RESULTS

The main focus of this section is to analyze the results. Ratios were calculated and were regressed according to equation developed. Results of the regressions have been put in different tables. As it has been mentioned before, the aim of this study is to investigate whether global financial crisis affected the determinants of capital structure or not. Accordingly, all ratios are calculated from 2004 to 2007 and again from 2008 to 2011.

4.1 Pearson Correlation Matrix

To make sure there is no multi-collinearity problem between all the variables, a VIF test was run in SPSS, and then it has been proved that there is no multi-collinearity problem. Tables in Appendix C, show the results of this test. All of the VIF values are below 2 which prove that multi-collinearity does not exist. After the VIF test, Pearson correlation matrix was run to see the possible correlation among variables. It should be mentioned that the data used for the study are stationary according to their unit root test.

According to table 8, debt is negatively correlated with profitability. Growth is not significant with any variables. Liquidity is significant and negatively correlated to tangibility and short term debt. NDTS is correlated to size. Profitability has negative

relationship with debt and short term debt. Size has negative relationship with NDTS and tangibility. Tangibility is negatively correlated to size and liquidity. STD is positively significant with TD and LTD, and negatively correlated to liquidity and profitability. LTD is significant with debt and STD positively.

Table 8. Pearson Correlation

	DEBT	GROW	LIQ	NDTS	PROF	SIZE	TANG	LTD	STD
DEBT	1								
GROW	-.050	1							
LIQ	-.146	.095	1						
NDTS	.037	.007	-.110	1					
PROF	-.267**	.044	-.026	.152	1				
SIZE	.144	-.028	-.131	-.499**	-.114	1			
TANG	-.085	-.037	-.490**	.086	.007	-.215*	1		
LTD	.874**	.025	-.003	-.049	.167	.139	-.137	1	
STD	.680**	-.137	-.287**	.149	-.281**	.079	.037	.238*	1

*. Significance level is evaluated at 0.05

**. Significance level is evaluated at 0.01

4.2 Results on Regression

As it has been mentioned before, this study uses different variables, debt ratio, growth ratio, liquidity, non-debt tax shield, size, profitability, tangibility, short term debt and long term debt. These ratios are chosen according to the previous studies done on non-financial firms. The model is multiple linear regressions which have been formulized according to the ratios:

1) $\text{Debt}_{it} = \beta 0 + \beta 1 \text{GROW}_{it} + \beta 2 \text{LIQ}_{it} + \beta 3 \text{PROF}_{it} + \beta 4 \text{NDTS}_{it} + \beta 5 \text{SIZE}_{it} + \beta 6 \text{TANG}_{it} + \mu_{it}$

2) $\text{STD}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROF}_{it} + \beta 4\text{NDTS}_{it}$

$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it}$

3) $\text{LTD}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROF}_{it} + \beta 4\text{NDTS}_{it}$

$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it}$

Then the ratios are used as input to Eviews software. The data format is determined as panel data, since 3 different factors are in use; year, ratios and names of the ratios. After calculating each ratio, the regression was run for both period; one being 2004 – 2007, and the other 2008 - 2011. Unit root test has been run for each of the variables individually. In all three models, intercept and trend shows that data are stationary, hence simple regression were run.

4.2.1 Regression Results on the First Equation

The first formula takes Debt ratio, which is one of the most important ratios in all firms as the dependent variable. It has been calculated by the division of total debt over total assets. The independent variables are growth ratio, liquidity, non-debt tax shield, size, profitability and tangibility.

1) $\text{Debt}_{it} = \beta 0 + \beta 1\text{GROW}_{it} + \beta 2\text{LIQ}_{it} + \beta 3\text{PROFIT}_{it} + \beta 4\text{NDTS}_{it}$

$+ \beta 5\text{SIZE}_{it} + \beta 6\text{TANG}_{it} + \mu_{it}$

There are 2 sets of tables for debt ratio, one is before and the other is after crisis. Table 9 and 10; Represent the regression for the mentioned ratios.

4.2.2 Total Debt Regression before Crisis

It has to be mentioned that the firms in this study are selected according to their market capitalization, so they have higher access to capital market and it is expected that they use more debt.

Table 9. Before Crisis form 2004 to 2007

Variable	Coefficient (t-Statistic)	Significance
GROWTH	-0.011035 (-0.253151)	0.8019
LIQUID	0.030966 (1.340874)	0.1900
NDTS	0.575524 (0.704580)	0.4865
PROFITABLITY	-0.171811 (-1.913465)	0.0653
SIZE	0.113304 (2.199140)	0.0357
TANGIBILITY	0.081683 (2.708286)	0.0111

R^2= 0.877389; Adjusted R^2= 0.807909; F statistics = 12.62799; Durbin-Watson stat = 2.003

As it is shown in table 9, before the crisis between 2004 and 2007 three variables are statistically significant: profitability, size and tangibility. Number of observations is 48 which is the result of multiplication of periods included by cross sections which are the firms here.

Profitability is significant at α=10 % which could be interpreted as, by 1 unit change in profitability, if other variables are not changed, total debt is expected to decrease by 0.17. The negative relation found in this study is consistent with the study of Rajan and Zingales (1995) and Jong et al. (2008). Size ratio is statistically significant at α=5% and α=10%. It could be said that when size is increased by 1 unit, debt would be increased by 0.11.

The positive correlation among these ratios is supported by Rajan and Zingales (1995) and Wald (1999). Tangibility is significant at α=5% and α=10% which states that by 1unit change in tangibility, while other variables are constant, total debt is expected to increase by 0.08.

4.2.3 Total Debt Regression after Crisis

Table 10. After Crisis form 2008 to 2011

Variable	Coefficient (t-Statistic)	Significance
GROWTH	0.058774 (1.806942)	0.0808
LIQUID	0.092374 (1.908397)	0.0659
NDTS	0.152277 (0.066769)	0.9472
PROFITABLITY	-0.260596 (-2.218091)	0.0343
SIZE	0.049928 (0.988484)	0.3308
TANGIBILITY	0.502222 (1.527416)	0.1371

R^2= 0.902079; Adjusted R^2 = 0.846591; F statistics = 16.25704; Durbin-Watson stat = 2.040

As it is shown in table 10, after the crisis between 2008 and 2011, growth, liquidity and profitability are statistically significant.

Growth is significant at α=10% which implies that by 1 unit change in growth, if other variables are not changed, total debt will increase by 0.058. Eriotis et al., (2007), Zou and Xiao (2006) found positive correlation between growth and debt. Liquidity is significant at α=10 % which implies that by 1 unit change in liquidity, if other variables are not changed, total debt ratio will increase by 0.09.

However, the results in this study are opposite to the Pecking order theory which expresses a negative relation among them (Deesomsak et al., 2004; Viviani, 2008). Profitability is significant at α=5% and α=10% which implies that by 1 unit change in profitability, if other variables are constant, total debt ratio will decrease by 0.26. Results show consistency to Zou and Xiao (2006).

4.2.4 Total Long Term Debt Regression before Crisis

Before the crisis between 2004 and 2007 growth, size and tangibility are statistically significant.

Table 11. LTD before Crisis form 2004 to 2007

Variable	Coefficient (t-Statistic)	Significance
GROWTH	0.056172 (2.071549)	0.0470
LIQUID	0.025962 (1.631776)	0.1132
NDTS	.084803 (1.890072)	0.684
PROFITABLITY	-0.025387 (-0.406820)	0.6870
SIZE	0.118311 (3.315246)	0.0024
TANGIBILITY	0.075535 (3.638034)	0.0010

R^2= 0.868995; Adjusted R^2 = 0.794758; F statistics = 11.70577; Durbin-Watson stat = 1.950

Growth is significant at α=5% and α=10% which implies that by 1unit change in growth, if other variables are not changed, total long term debt will increase by 0.056. Results of previous studies is in contrast with this study. Michaelas et al., (1999) found negative relation between growth and long term debt.

Size is significant at α=1, 5 and 10% which implies that by 1 unit change in size of firms, if all other variables stay constant, total long term debt will increase by 0.11. Tangibility also is significant at α=1, 5 and 10% which implies that by 1 unit change in size of firms, if all other variables stay constant, total long term debt will increase by 0.07.

4.2.5 Total Long Term Debt Regression after Crisis

After and during the crisis between 2008 and 2011 statistically significant variables are growth, liquidity, profitability, size, tangibility.

Table 12. LTD After Crisis form 2008 to 2011

Variable	Coefficient (t-Statistic)	Significance
GROWTH	0.073717 (2.637097)	0.0131
LIQUID	0.152922 (3.676144)	0.0009
NDTS	0.639049 (1.346459)	0.1882
PROFITABLITY	-0.270996 (-2.683969)	0.0117
SIZE	0.087706 (2.020476)	0.0523
TANGIBILITY	0.639743 (2.263965)	0.0310

R^2= 0.899235; Adjusted R^2 = 0.842135; F statistics = 15.748; Durbin-Watson stat = 2.13

Growth is significant at α=5 and 10% which implies that by 1unit change in growth, if other variables are fixed, long term debt will increase by 0.07.

Liquidity is significant at α=1, 5 and 10% which implies that by 1unit change in liquidity, if other variables are fixed. , long term debt will increase by 0.15.

Profitability is significant at α=5 and10% which states that by 1 unit change in size, if other variables stay unchanged, long term debt will decrease by 0.27. Size is significant at α=10% which states that by 1 unit change in size, having other variables unchanged, long term debt will increase by 0.087. Tangibility is significant at α=5 and 10% which implies that by 1 unit change in tangibility, if other variables are unchanged, long term debt will increase by 0.63. Abdullah (2005) have found the same correlation between these two variables.

4.2.6 Total Short Term Debt Regression before Crisis

Firms issue securities to borrow money and use the raised fund for the transactions. In a financially healthy firm the amount of cash or cash equivalents has to be more than the short term borrowings in order for the firm to pay off its debts. Before the crisis between 2004 and 2007 two variables are found to be statistically significant; liquidity and profitability.

Table 13. STD before Crisis form 2004 to 2007

Variable	Coefficient (t-Statistic)	Significance
GROWTH	0.001322 (0.047206)	0.9627
LIQUID	-0.006644 (-1.404467)	0.04887
NDTS	0.015400 (0.025987)	0.9794
PROFITABLITY	-0.125824 (-1.952871)	0.0602
SIZE	0.038451 (0.043556)	0.3504
TANGIBILITY	0.018137 (0.846072)	0.4042

R^2=0.611387; Adjusted R^2 = 0.591173; F statistics = 6.776328; Durbin-Watson stat = 2.172

Profitability is significant at α=10 %. It could be said that by an increase of 1 unit in profitability, considering other variables to be constant, the short term debt will decrease by 0.12. The result is also consistent with the one concluded by (Abdullah, 2005). Liquidity is significant at α=5 and 10 % which could be interpreted as, by 1 unit change in liquidity, if other variables are not changed, short term debt is expected to decrease by 0.048.

4.2.7   Total Short Term Debt Regression after Crisis

After and during the crisis between 2008 and 2011 four variables are statistically significant, liquidity, NDTS, size and tangibility.

Table 14. STD after Crisis form 2008 to 2011

Variable	Coefficient (t-Statistic)	Significance
GROWTH	-0.075889 (-1.235328)	0.2263
LIQUID	-0.178170 (-1.948956)	0.0607
NDTS	-0.720220 (-4.488816)	0.0186
PROFITABLITY	0.043201 (0.194695)	0.8469
SIZE	0.257523 (2.699520)	0.0113
TANGIBILITY	0.339751 (3.767706)	0.0007

R^2= 0.773929; Adjusted R^2 = 0.645822; F statistics = 6.041265; Durbin-Watson stat = 2.397

Liquidity is significant at α=10 %. It interprets as by increasing 1 unit in liquidity, short term debt will decrease by 0.17.

NDTS is statistically significant at α=5 and 10% which illustrates that by 1 unit change in NDTS, if other variables stay steady, short term debt decreases by 0.72. Size is significant at α=5 and 10 %.

Since the ratio is a function of sale it could be said, as it was expected, an increase in size by 1 unit, short term debt could increase by 0.25. The same interpretation is true for tangibility. Short term debt will increase by 0.33 when tangibility increases by 1 unit.

Next chapter will provide a brief summary of all significant variables before and after crisis. Also, it concludes the empirical results and suggests possible further studies.

Chapter 5

DISCUSSIONS AND CONCLUSION

The aim of this study was to determine the effects of common financial ratios, and to see how firms make the best decision in financing their financial needs. The study chose 12 firms with highest market capitalization in EURONEXT N.V. Also, 9 different variables were introduced. Short term debt, long term debt and total debt ratios are considered to be the dependent variables. Growth, liquidity, non-debt tax shield, profitability, size and tangibility are those independent variables which could affect the dependent variables. OLS regression was chosen to evaluate the relationship between variables.

5.1 Discussion

The study evaluated a period of 8 years from 2004 to 2011 which includes the global crisis. The results in this study are relatively different from other studies. Regression analysis for 2008 to 2011, showed interestingly different correlation among variables. According to descriptive analysis, mean of long term ratio debt in this study is reported to be around 3 times more than short term debt ratio, which shows an opposite situation compared to other studies such as Hall *et al* (2004) and Abor (2009). However, results on regression are almost similar to the ones found in previous studies. Before crisis form 2004 to 2007, profitability and size were found to be negatively and positively related to total debt, respectively. Studies of Rajan and Zingales (1995), and Jong et al. (2008) support the relation between profitability

and total debt. Theoretical background states that the relations between these variables are expected to be both in positive and negative ways. It could be expressed that large firms with numerous amount of income and profitability are expected to use internal financing rather than external one. Theoretical background (trade-off theory and pecking order theory) concluded that size is positively correlated to total debt. This study has found the same correlation. The positive correlation among these ratios is supported by Rajan and Zingales (1995) and Wald (1999). Since it would be less costly for such large firms, as this study chose, it is expected that these firms have issued debt to earn the needed fund. During crisis, growth and liquidity are positively correlated to total debt. Also, profitability is negatively related to total debt. It could be said that the firms preferred to borrow fund in order to increase the cash income and generate more profit.

Long term debt showed dependency to growth, size and tangibility before crisis. All of them are positively correlated to long term debt. During the crisis growth, liquidity, profitability, size and tangibility are correlated to long term debt. It could be said that long term debt improve the size of firms in crisis, since the cost of it is supposed to being paid back in a long run. Consequently, firms will pay fewer taxes.

Short term debt is correlated to liquidity and profitability before crisis. It could be said the chosen firms prefer to use current assets to increase the fund needed. After crisis, short term reported to be significant with liquidity, NDTS, size and tangibility. As it is expected during the crisis short term debt is considered to be costly. So it states that firms chose internal financing rather than short term borrowing during crisis. The same interpretation is true for size and tangibility.

It could be concluded that during crisis internal financing was the preferable option for the chosen firms rather than short term debt. This study has clearly shown that firms preferred to use long term debt rather than short term. Also, liquidity has become an important variable for leverage after the crisis, and also it seems that decrease in tangibility was a source of increase in liquidity.

It is suggested for further study to construct a more powerful panel data by choosing a longer time horizon and more firms.

REFERENCES

Abdullah, A. (2005). Capital structure and debt maturity: evidence from listed companies in Saudi Arabia. Journal of Business and Economics, 11, 15-33.

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. The Journal of Risk Finance, 6(5), 438-445.

Agboola, A.A. & Salawu, R.O. (2008). The determinants of Capital Structure of Large non-financial listed firms in Nigeria. The International Journal of Business and Finance Research, 2(2), 75-84.

Antoniou, A., Guney, Y. & Paudyal, K. (2008). The Determinants Of Corporate Debt Ownership Structure, Evidence From Market-Based and Bank-Based Economies. *Journal Of Managerial Finance*, 34(12), 821-847.

Bauer, P 2004, „Determinants of capital structure: empirical evidence from the Czech Republic", Czech Journal of Economics and Finance, vol. 54, pp. 2-21.

Booth, L., Aivazian, V., Demirguc-Kunt, A.E & Maksimovic, V. (2001). Capital Structure in developing countries. Journal of Finance, 56(1), 87-130.

Bos, T. & Fetherson, T.A. (1993). Capital Structure practice on the specific firm. Research in International Business & Finance, 10, 53-66.

Chen, Linda H., Robert Lensink, and Elmer Sterken. The determinants of capital structure: Evidence from Dutch panel data. University of Groningen, 1999.

Chen, J.J. (2004). Determinants of capital structure of Chinese-listed companies. Journal of Business Research, 57, 1341-1351.

Constantinides, G.M. (2003). Handbook of the Economics of Finance. New York: Elsevier North Holland.

DeAngelo, H. and Masulis, R.W. (1980), "Optimal capital structure under corporate and personal taxation", Journal of Financial Economics, Vol. 8, pp. 3-29.

Deesomsak, R., Paudyal, K. & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. Journal of Multinational Financial Management, 14, 387-405.

Donaldson, Gordon, 1963, Financial goals: Management vs stockholders, Harvard Business Re-view 41, 116-129.

Eriotis, N., Vasiliou, D. and Ventoura-Neokosmidi, Z. (2007), "How firm characteristics affect capital structure: an empirical study", Managerial Finance, Vol. 33 No. 5, pp. 321-31.

Ferri, M.G. and Jones, W.H. (1979), "Determinants of financial structure: a new methodological approach", The Journal of Finance, Vol. 34 No. 3, pp. 631-44.

Friend, I. & Hasbrouck, J. (1988): Determinants of Capital Structure. In: Chen, A. (ed.): *Research in Finance*, vol. 7. JAI Press Inc., New York, pp. 1–19.

Friend, I. & Lang, L. (1988): An Empirical Test of the Impact of Managerial Self-interest on Corporate Capital Structure. *Journal of Finance*, vol. 43, 1988, pp. 271–281.

Gaud, P, Jani, E, Hoesli M and Bender A 2005, „The capital structure of Swiss companies: An empirical analysis using dynamic panel data", *European Financial Management,* vol. 11, no. 1, pp. 1-28.

Giacomo Morri, Christian Beretta, (2008) "The capital structure determinants of REITs. Is it a peculiar industry?", Journal of European Real Estate Research, Vol. 1 Iss: 1, pp.6 – 57

Gonedes, N. J. & Lang, L. & Chikaonda, M. (1988): Empirical Results on Managerial Incentives and Capital Structure. The Wharton School, University of Pennsylvania, Working Paper.

Green, C.J., Murinde, V., & Prasad, S. (2001). Company Financing, Capital Structure, and Ownership: A Survey, and Implications for Developing Economies.

Grossman and Hart (1988). "One Share/One Vote and the Market for Corporate Control". *Journal of Financial Economics,* 20 (1/2): pp.175–202.

Hall, G.C., Hutchinson, P.J. & Michaelas, N. (2004). Determinants of the capital structures of European SMEs. Journal of Business Finance and Accounting. 31(5/6), 711-728.

Harris, M. & Raviv, A. (1991). The theory of capital structure. Journal of Finance, 46(1), 297-355.

Heng, T.B., & Tze-San. O.(2011). Capital Structure and Corporate performance of Malaysian Construction Sector. International Journal of Humanities and Social Science, 1(2), 28-36

Huang, Samuel G.H., *and* Frank M. Song. *(2006). The Determinants of Capital Structure: Evidence from China. China. Economic Review, 17, 14-35*

Jensen, M. & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305-360.

Jensen, M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review, 76, 323-339.

Karadeniz, E., Kandir, S.Y., Balcilar, M. and Onal, Y.B. (2009), "Determinants of capital structure: evidence from Turkish lodging companies", International Journal of Contemporary Hospitality Management, Vol. 21 No. 5, pp. 594-609.

Kayo EK and Kimura, H 2011, „Hierarchical determinants of capital structure".
Journal of Banking and Finance, vol. 35, pp. 358–71.

Kester, C. W. (1986): Capital and Ownership Structure: A Comparison of United
States and Japanese Manufacturing Corporations. *Financial Management*, vol.
15, 1986, pp. 5–16.

Kim, W. S. & Sorensen, E. H. (1986): Evidence on the Impact of the Agency Costs
of Debt in Corporate Debt Policy. *Journal of Financial and Quantitative
Analysis*, vol. 21, 1986, pp. 131–144.

Long, M. & Malitz, I. (1985): The Investment-financing Nexus: Some Empirical
Evidence. *Midland Corporate Finance Journal*, vol. 3, 1985, pp. 53–59.

Marsh, P. (1982): The Choice between Equity and Debt: An Empirical Study.
Journal of Finance, vol. 37, 1982, pp. 121–144.

Mazur, K. (2007), "The determinants of capital structure choice: evidence from
Polish Companies", International Advances in Economic Research, Vol. 13,
pp. 495-514.

Modigliani, F. and Miller, M.H. (1963), "Corporate income taxes and cost of capital:
a correction", American Economic Review, Vol. 53, pp. 443-53.

Mouamer, F.M. (2011). The determinants of capital structure of Palestine-listed companies. The Journal of Risk Finance, 12(3), 226-241.

Myers, S.C. & Majluf, N.S. (1984). Corporate Financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13, 187-221.

Myers, S.C. (2001), "Capital structure", The Journal of Economic Perspectives, Vol. 15No. 2, pp. 81-102.

Rajan, G.R. & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. Journal of Finance, 50, 1421-1460.

Ross, Stephen (1977), "The determination of financial structure: the incentive-signaling approach", *Bell Journal of Economics*, **8**, 23–40.

Schoubben, F., Van Hulle, C. (2004). The determinants of leverage: differences between quoted and non-quoted firms. *Tijdschrift voor Economie en Management, 59,* 4, 589-622

Serrasqueiro, ZMS and Roga˜o, MCR 2009, „Capital structure of listed Portuguese companies: Determinants of debt adjustment", Review of Accounting and Finance, vol. 8, no. 1, pp. 54-75.

Sheikh, N.A., & Wang, Z. (2011), Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. Managerial Finance, 37(2), 117-133.

Titman, S. & Wessels, R. (1988). The determinants of capital structure choice. Journal of Finance. 43(1), 1-19.

Viviani, J. (2008), "Capital structure determinants: an empirical study of French companies in the wine industry", International Journal of Wine Business Research, Vol. 20 No. 2, pp. 171-94.

Wald, J.K. (1999), "How firm characteristics affect capital structure: an international comparison", The Journal of Financial Research, Vol. 22 No. 2, pp. 161-87.

Wiwattanakantang, Y 1999, „An empirical study on the determinants of the capital structure of Thai firms", Pacific-Basin Finance Journal, vol. 7, pp. 371-403.

Zou, H. and Xiao, J.Z. (2006), "The financing behavior of listed Chinese firms", The British Accounting Review, Vol. 38, pp. 239-58.

APPENDICES

Appendix A: Firms Information

Firms are chosen according to their market capitalization in 2012.

1. Information and Technology

ASML N.V

According to ASML website, ASML (Advanced Semiconductor Materials Lithography) was founded in 1984 worked as a joint venture between the Dutch firms. ASML Holding NV manufactures semiconductor processing outfit, which is used in the integrated circuits or chips all over the world. Previously, the company was known as ASM Lithography Holding N.V. and later in 2001 changed to ASML Holding N.V. The company's headquarters is located in Veldhoven, the Netherlands. ASML (symbol) is traded in Euronext Amsterdam and NASDAQ with 10,636 employees and the total turnover of €4.73 billion in 2012 (Company's website).

Gemalto N.V

According to Gemalto website, the company is a combination of Gemplus International and Axalto which founded in 2006. The head office is located in Amsterdam, the Netherlands. Gemalto N.V. has around 10,000 employees and 106 nationalities, active in Electronics. It produces software and services, smart cards and terminals which secured and improved individuals' digital life. It is listed on Euronext Amsterdam with the symbol of GTO. The total turnover reported as € 2.25 in 2012 (Company's website).

TomTom N.V

According to TomTom N.V website, this company was founded in 1991. It produces GPS navigation software, navigation devices and GPS maps. This firm is the leading manufacturer of navigation systems in Europe and publically traded in Euronext stock exchange under the symbol of TOM2. Its total turnover reported as 1.5 billion Euros in 2012 with 3490 employees (Company's website).

2. Support & Services

Fugro N.V

According to Fugro website, it is an international company founded in 1962. Its main center is located in Leidschendam, the Netherlands. Activities such as Survey, Geotechnical and Geoscience services are provided by Fugro Company. The main office is located in Leidschendam, Netherlands. It is listed on Euronext Amsterdam since 1992, with 12.165 employees and about €2.17 billion total turnover in 2012 (Company's website).

Randstad N.V

According to Randstad website, it is a Dutch firm which is founded in 1960 in Netherlands. The head office is in Diemen, Netherlands. Its areas of services consist of consulting, human resources, employment agencies and outsourcing. It is listed on Euronext Amsterdam under the symbol of RAND with over 611.020 employees. The total turnover of the company reported as € 17.9 billion in 2012 (Company's website).

USG People N.V.

According to USG People website, it is a Dutch company founded in 1997 and active in eight European countries. The head office is located in Almere, Netherlands. The area of its business includes HR services, employment services and recruitment. It is publically traded on Euronext Amsterdam with the symbol of USG and more than 6.047 employees. In 2012, the total turnover of the company reported to be around € 2.87 billion (Company's website).

3. Constructions

Arcadis N.V

According to ARCADIS website, this company was founded in 1880 in Netherlands. It provides consultancy, designs, management, and engineering organization in different fields such as building, water and environment. It is listed on Euronext Amsterdam with the symbol of ARCAD and has more than 21.696. The total turnover for the company reported as € 2.54 billion in 2012 (Company's website).

BAM Groep N.V

According to BAM Groep website, Koninklijke BAM Groep (Royal BAM Group) was founded in 1869 in Netherlands. Its head office is located in Bunnik. The company offers construction services and is publically traded in Euronext Amsterdam under the symbol of BAMNB. BAM Group has over 23,734 employees,

and the total turnover reported for this company in 2012 was around € 7.4 billion (Company's website).

Boskalis Westminster N.V.

According to Boskalis website, this Company was founded in 1910 in Netherlands. It provides international construction and services. The head office is in Papendrecht, Netherlands. It has over 15,653 employees and listed on Euronext Amsterdam with the symbol of BOKA. Total turnover reported in 2012 is as € 3.1 billion (Company's website).

4. Food Producers & Processors

CSM N.V.

According to CSM website, it is a Netherlands-based firm founded in 1919. It supplies Bakery ingredients, for bakeries, supermarkets, caterers, takeaway companies and Purac, to produce green chemicals, bio plastics and mineral fortifications. The company is listed on Euronext Amsterdam under the symbol of CSM with more than 9,700 employees. As reported in 2012, total turnover was around € 753 million (Company's website).

Nutreco N.V

According to Nutreco website, this company is an international firm that operates in food processing which produces fish food, animal nutrition and processed meat. It was founded in 1994, and listed on Euronext Amsterdam under the symbol of NUO. The head office is located in Amersfoort, Netherlands. It has more than 9,655

employees working in 30 countries. The total turnover reported in 2012 was around € 5.23 billion (Company's website).

Unilever N.V

According to Nutreco website, it is an Anglo-Dutch company which was founded in 1930. The company provides international consumer goods such as beverage, foods, personal care products, cosmetics and cleaning agents. It is listed in Euronext Amsterdam with the symbol of UNA. This company includes 169,000 employees and reported total turnover in 2012 was around € 51.32 billion (Company's website).

Appendix B: Correlation and Multi-Collinearity Statistics

Correlation

	Debt	Growth	Liquidity	NDTS	Prof	Size	Tang	LTD	STD
Debt	1 96	-.050 .629 96	-.146 .156 96	.037 .719 96	-.267** .009 96	.144 .160 96	.085 .409 96	.874** .000 96	.680** .000 96
Growth	-.050 .629 96	1 96	.095 .359 96	.007 .944 96	.044 .672 96	-.028 .786 96	-.037 .722 96	.025 .813 96	-.137 .945 96
Liquidity	-.146 .156 96	.095 .359 96	1 96	-.110 .284 96	-.026 .798 96	-.131 .203 96	-.490** .000 96	-.003 .978 96	-.272** .005 96
NDTS	.037 .719 96	.007 .944 96	-.110 .284 96	1 96	.152 .139 96	-.499** .000 96	.086 .403 96	-.049 .633 96	.149 .023 96
Prof	-.267** .009 96	.044 .672 96	-.026 .798 96	.152 .139 96	1 96	-.114 .268 96	.007 .944 96	.167 .103 96	-.281** .006 96
Size	.144 .160 96	-.028 .786 96	-.131 .203 96	-.499** .000 96	-.114 .268 96	1 96	-.215* .035 96	.139 .178 96	.079 .342 96
Tang	.085 .409 96	-.037 .722 96	-.490** .000 96	.086 .403 96	.007 .944 96	-.215* .035 96	1 96	-.137 .182 96	.037 .583 96
LTD	.874** .000 96	.025 .813 96	-.003 .978 96	-.049 .633 96	.167 .103 96	.139 .178 96	-.137 .182 96	1 96	-.238* .020 96
STD	.680** .000 96	-.137 .945 96	-.287** .005 96	.149 .023 96	-.281** .006 96	.079 .342 96	.037 .583 96	.238* .020 96	1 96

*. Significance level is evaluated at 0.05

**. Significance level is evaluated at 0.01

Coefficients[a]

	Model	Collinearity Statistics	
		Tolerance	VIF
1	growth	.986	1.013
	liquidity	.605	1.692
	NDTS	.679	1.468
	profit	.969	1.081
	size	.621	1.624
	tang	.655	1.568

a. Dependent Variable: Total Debt

Coefficients[a]

	Model	Collinearity Statistics	
		Tolerance	VIF
1	debt	.804	1.161
	growth	.970	1.015
	liquidity	.576	1.178
	NDTS	.673	1.472
	profit	.882	1.122
	size	.612	1.640
	tang	.638	1.560

a. Dependent Variable: Long Term Debt

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	debt	.804	1.161
	growth	.970	1.014
	liquidity	.576	1.579
	NDTS	.673	1.446
	profit	.882	1.115
	size	.612	1.631
	tang	.638	1.538

a. Dependent Variable: Short Term Debt