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Master Thesis in Finance

How do macroeconomic factors affect capital structure? The case of Swedish firms

by

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Abstract

Using unbalanced panel data for the sample period 2002-2012, this study investigates the relation between macroeconomic factors and the capital structure of 233 Swedish companies. Using the Random Effects model, this paper identifies the macroeconomic determinants that affect the capital structure of Swedish firms. We find that the leverage measures are positively related to the GDP Growth rate, Interest rate, Banking Credit as percentage of GDP ratio and the Stock price performance, while the Inflation rate has a negative effect on the leverage. This paper also provides evidence that banking sector is important for the Swedish firms.

Keywords: Capital Structure, Leverage, Random Effects Model, Panel Data

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Contents

1. Introduction

Firms' capital structure is considered one of the most discussed topics in the field of finance. The capital structure theory is still raising interesting debates related to Myers's (1984: p. 575) question: "How do firms choose their capital structure?" It's fair to say that after 30 years, there is no complete consensus around this issue since it is complicated to come up with a clear and objective answer to this important and controversial question.

This could be explained by the fact that the optimal amount of debt in the capital structure is highly subjective to the industry, the legal system, the accounting regulations, the tax policy and other elements that differentiate one country from another. Recognizing that the crucial choice of the firms' capital structure has multidimensional characteristics, it is easier to understand the reason why Myers's question does not have one single and objective answer.

According to the findings of previous empirical studies, the strategic decision of a particular capital structure is affected by firm specific and macroeconomic factors (Hackbarth, D., Miao, J., and Morellec, E., (2006), Antoniou, A., Guney, Y., and Paudyal, K., (2008), Antoniou, A., Guney, Y., and Paudyal, K. (2002), Mokhova, N., Zinecker M., (2014). However, as it is demonstrated later on this paper, there is not a clear picture of the direction of impact of these factors on the firms' capital structure. Considering that the impact of firm-specific factors can, to some extent, be managed by the managers, the majority of related studies utilize firm-specific variables as determinants of capital structure.

However, the importance of the macroeconomic factors cannot be neglected. "*In the economic and financially integrated world of today, no company can remain unaffected by what happens in the world economy. Thus, interconnectedness places new demands on company management to consider the connection between their own company's development and changes in the company's macroeconomic environment*" Oxelheim (1999: p.66). In other words, the better the management of a company understands the power and dynamics of macroeconomic factors on the capital structure, the more flexible and efficient it will be during the decision making process.

Even though the macroeconomic environment cannot be predicted or controlled to a large extent, the management of a company can mitigate the impact of the unexpected fluctuations, and even take advantage of them, by adding the elements of adjustability and flexibility to the structure of the company's operations. Oxelheim and Wihlborg (2008: p.5), argue that in order this to happen it is crucial for the management "*to recognize the interdependence among a number of macroeconomic variables and that these variables influence the firm through a variety of channels not captured by conventional accounting systems*".

Being aware of the exposure to macroeconomic shocks, management can apply the MUST-analysis approach (see Oxelheim and Wihlborg, 2008) in order to minimize this exposure.

Furthermore, the level of development of the economy should also be taken into consideration. According to Glen and Singh (2004), there is a considerable difference between the capital structure in developed and underdeveloped countries, as well as in countries that are under an economic transition from an undeveloped economy to a developed one.

Another worth mentioning dimension in the discussion of the factors that influence the firms' capital structure is the orientation of the economy. The distinction that can be made is between capital market oriented and bank oriented economies. Examples of typical capital market based economies are U.S.A and U.K., whereas examples of bank oriented economies are Germany, France and Japan (Demirguc-Kunt, Asli & Levine, Ross, 1999). According to Demirguc-Kunt, Asli & Levine, Ross (1999), capital market based economies are considered to be more transparent and protective to investors, whereas bank oriented economies are characterized by lower transparency and weaker investor protection.

Moreover, they make a reference to their paper to the corporate ownership condition that exists in market-based and bank-based countries, stating that in bank-based economies (with Germany as the main representative), companies are held in a more concentrated way, while in market-based economies (the U.S.A., the United Kingdom) this is not the case. In addition, companies that operate in capital-based economies are characterized by a lower level of debt, in comparison with the firms that operate in bank oriented economies (Demirguc-Kunt, Asli & Levine, Ross, 1999).

The purpose of this study is to determine the extent and direction of the impact of macroeconomic conditions on the capital structure decision. We aim to find how firms in Sweden are affected by the macroeconomic environment, when making their financing decision, considering the fact that Sweden is a bank-oriented economy (Lööf, 2004)[1].

Rajan and Zingales (1995: p.1445) argue that "… *a better measure of the importance of the banking sector in financing a firm is the ratio of bank loans made to private sector over GDP*". In their study they conclude that this ratio is more important and substantial for bank-oriented economies rather than for market oriented economies. Therefore, we include this variable in our model in order to determine the importance of the banking sector on the Swedish firms.
A related study has been presented by Antoniou, A., Y. Guney, and K. Paudyal (2008). They use the example of the G5 countries, such as USA and UK (Capital Market Oriented economies) and Japan, Germany and France (Bank Oriented Economies) to investigate how do firms in those economies determine their capital structure.

Antoniou et al. (2008) study reveals that there are both differences and similarities in the capital structure determinants of firms operating in capital market and bank oriented

[1] Lööf (2004), in his paper "*Dynamic optimal capital structure and technical change"*, argues that companies in Sweden and most widely in Scandinavia, operate in a bank oriented system as it happens in Germany and France.

economies. They suggest that these differences can be attributed to the institutional arrangements and the legal traditions of these countries. Moreover, Antoniou et al. (2008) arrive in two important conclusions:
(i) The results found for one country cannot be generalized to other countries which have different legal and institutional traditions.
(ii) When trying to determine the financing strategy, managers take into account not only firm specific factors, but also the general market characteristics that apply to a specific country.

Stimulated by these conclusions, we aim to investigate the macroeconomic determinants of capital structure of Swedish firms, from the angle of the bank orientation of the economy. The selection of Sweden for our study is determined by the existence of its distinct legal[2] and institutional traditions which imply that the results of other papers on bank oriented economies cannot be generalized to Sweden.

In addition to this, as far as we know, there is no other similar study which tries to determine the importance of banking sector as determinant of the Swedish firm's capital structure.
The output of this study will be valuable for the Swedish firms, since identifying the way that macroeconomic factors interact with the capital structure will give them the advantage of formulating an effective financing policy as well as predict their competitors' reaction to the market changes.

The rest of the paper is organized as follows: In section 2 we review the existing capital structure theories. Section 3 presents an empirical review. The distinct characteristics of the Swedish economy are presented in section 4, whereas section 5 includes discussions about data collection and variable specifications. In section 6 we define the regression model, whereas section 7 displays the results and the analysis. Finally, the paper is concluded by section 8.

[2] Legal scholars Merryman and Clark (1978) "…it is a set of deeply rooted, historically conditioned attitudes about the nature of the law, about the role of law in the society and the politics, about the proper organization and operation of a legal system, and about the way the law is or should be made, applied, studied, perfected and taught"

2. Review of existing theories

During the last decades, many theories have been used in order to explain the companies' preferences related to their finance decision. In our paper we are briefly presenting the most known of them:

2.1. Pecking Order Theory

Not taking the optimal capital structure as a target, Pecking Order Theory states that firms prefer internal to external finance, by following a hierarchy of financing sources that puts first the internal funds, then external debt and equity as last choice. Companies want to avoid giving ownership to external investors (by issuing equity) and because of this they try to solve their financing problem with debt, in case internal funds are not an option. Pecking Order Theory is considered to be the dominating theory in this area (Myers, S.C., and Majluf, N., 1984).

2.2. Trade-off Theory

The Trade-off theory of capital structure derives from the concept that firms prefer to be financed by a combination of external debt and equity. In this way, they benefit from the positive consequences of having debt (tax shield, managerial discipline, FCF control, etc.) but at the same time they have to tackle the costs that are associated with the use of debt (financial distress, reduced pricing flexibility, bankruptcy, asset substitution, etc.). This tradeoff related to the effect of debt will determine the optimal debt to equity ratio of the firm (Kraus, A., and R.H. Litzenberger, 1973).

2.3. Free Cash Flow Theory

According to Jensen's free cash flow theory (1986), the use of debt can be an incentive for managers to be more productive, assuming access to large free cash flow. As we know, the more levered the firm is the higher the probability of default. This means that managers will have the motivation to invest in projects that will have a positive NPV, since the performance of the company is highly related to their personal profits. In this way, firms try to find the optimal amount of debt by balancing the bankruptcy cost of the increased debt and the benefit that this debt creates.

2.4. Asymmetric Information Theory

Another worth mentioning theory is Asymmetric Information Theory, which is based on the assumption that managers have a much better picture about the processes and the assets' value of the firm. This theory proposes that debt is used as a mean of financing in order to avoid neglecting value-adding investment opportunities during economic recessions. As a

result, according to this theory, macroeconomic conditions will have a negative impact on the capital structure decisions.

3. Review of Empirical Background

At this point we present empirical findings from other studies, related to elements that affect firms' capital structure:

Stulz's (1990) model deals with the relation between the managerial discretion and the role of firm's financing decisions. He supports that the problems of overinvestment and underinvestment that occur when managers adopt a selfish behavior inside the company can be prevented by controlling the amount of cash and generally the resources that they have available. In other words, the capital structure can, to some extent, eliminate or decrease the agency cost of managerial discretion.

Moreover, Stulz (1990) argues that an increase in cash flow leads to an increase of the optimal face value of debt. When operating in a period with high economic growth (high cash flow and low probability of bankruptcy) firms would prefer to use more debt in their finance mix. On the other hand, they would prefer to be financed with less debt during an economic recession, since the cash flow is limited. Taking the above into consideration, capital structure will be affected by the macroeconomic conditions in a positive way.

Ross (1977) in his paper argues that firms tend to issue debt in order to be considered as a firm with solid and stable cash flow. In other words, issuing debt transfers a valid signal to potential investors and the general public in financial fields of a more productive and efficient firm.
Leland and Pyle (1977) come to almost the same conclusion, adding that the equity that managers hold constitutes a signal of the firm quality.

Myers and Majluf's (1984) paper shows that, if investors possess less information than firm's insiders about the value of an asset, or if there is information asymmetry problem, issuing equity by the firm would signal that the value of the asset is overestimated. Therefore there is a chance that investors would not be willing to pay for an overvalued asset and consequently the price of the asset would decrease significantly. This might create problems in the case that firms are required to finance investment projects by issuing equity, because the underpricing of equity may be so large that it may result in a net loss to existing shareholders. In this case, it would make no sense to proceed with the investment project even if its NPV is positive.

Narayanan's (1988) paper argues that firms have an incentive to use external debt in order to finance their projects, in an attempt to avoid underinvestment problems. Assuming an asymmetry of information, firms prefer to avoid the use of the undervalued equity for financing their investments, because in this way they will not miss beneficial investment

opportunities during economic recessions. In accordance with the pecking order theory mentioned above, Narayanan argues that debt is superior to equity as a financing solution, without though forgetting to refer to the risk that this financing option implies.

Miller (1977) supports, in his paper, that leverage is negatively related to economic growth, while Jensen and Meckling (1976) point out the engagement of the lenders in monitoring the firms as a positive effect of debt.

Korajczyk and Levy (2003) in their paper try to analyze the capital structure choice by using macroeconomic conditions. They model the capital structure as a function of firm-specific and macroeconomic conditions. Moreover, they divide the sample into two sub-samples of financially constrained and financially unconstrained firms. They find that capital structure decision is inversely related to the economic conditions for the relatively unconstrained sample of firms, whereas it is pro-cyclical for the relatively constrained sample of firms. They also conclude that in the case of unconstrained firms, the macroeconomic factors are significant for issue choice, while they are not always significant for constrained firms.

Hackbarth, Miao, and Morellec (2006) is one of the first papers to show that macroeconomic conditions have implications to firms' financing policies. The paper studies the impact of macroeconomic conditions on credit risk and capital structure choice. They argue that the default policy used to maximize shareholder's value is characterized by a different threshold for each state and which are inversely related to macroeconomic conditions. Furthermore, they analyze the impact of macroeconomic conditions on the capital structure changes, and the debt capacity. Finally, their model predicts that the market leverage should be countercyclical.

From this review of empirical studies, we realize that their results vary and that most of the times, they do not come to the same conclusion. We aim to address this issue once more, incorporating this time data provided by a Nordic country, Sweden. As mentioned above, Sweden is a bank-oriented economy like Germany and France. But it would be a mistake to generalize the results of other bank-oriented countries to the Swedish case due to its distinct legal and institutional traditions (Antoniou et al., 2008).

4. Characteristics of the Swedish economy

In the early 90's most of the North European countries sank into a two-year recession as banks' capital froze and they stopped lending. Financial meltdown, rocketing unemployment and housing bubble burst were the main characteristics of Swedish economy, which up until

then was booming. The recession that Sweden suffered between 1992-1994, resulted to a GDP loss of 5% and high unemployment, which remained high for a long period. In order to tackle this problematic situation, the Swedish government decided to inject a large amount of money in the banking system. The key success factor in regulating the bank system and generally in stabilizing the economy with disciplined fiscal measures, was the consensus from all the political parties, regardless of which party was in power.

During the recent financial crisis in 2008, Sweden was not affected to the extent that other countries were. According to Professor Calmfors (2012) (Stockholm University): "*Sweden went into the crisis in 2008 in a stable and reasonable shape with quite a large fiscal surplus. There has been no need for fiscal tightening during the crisis as in many of the Eurozone countries with high government debt*". In an attempt to further explain the reasons why Sweden felt the impact of the recession less than elsewhere, Calmfors (2012) adds: "*The lesson from the crisis in the 1990s was that the fiscal house must be kept in order and that in normal times if you can shore up your finances you have room for manoeuvre later during a recession*". However, we should not neglect the fact that the crisis of 2008, has negatively affected Sweden in issues such as unemployment, exchange rate stability and exports.

Another important fact that contributed to the "soft landing" of Swedish economy during the recent crisis is the flexibility in terms of monetary policy, given that Sweden is not a member of the Eurozone. Having the ability to control its own monetary and fiscal policy, Sweden can to a large extent hedge its economy in terms of exchange rate, inflation and interest rate fluctuations worldwide. Also, given the openness of the Swedish economy to international trade and its traditionally export orientation, the ability of Sweden to conduct and adjust its monetary policy constitutes a crucial factor in positioning the country on a highly competitive level. Other elements that enhance the competitiveness of Sweden compared to other countries are its strategic location, its highly qualified work-force, and the systematic focus on technological research.

Moreover, given the systematic regulation of the banks and the considerable development of this sector in Sweden during the last years, it is easy to understand the close relationship of Swedish firms with the banks. According to Han-Suck Song (2005), Swedish companies are on average characterized by a high level of leverage, with short-term debt constituting a relatively big part of the companies' total debt.

Another important characteristic of the Swedish system which is worthwhile to note, is the high transparency and consensus in the political decision making process. This implies a reduced political risk and flexibility in formulating the conditions for doing business. Foreign investment inside the Swedish territory is encouraged and supported by the government and more specifically by *The Swedish Trade and Invest Council* which provides assistance to all the foreign companies that seek to establish or expand their business in Sweden. This assistance includes a set of financial incentives such as loans, grants, credit guarantees, etc.

As far as the legal system is considered, in Sweden is applied a combination of statute and case law. Also, the fact that Sweden is a member of EU (since 1995) implies that the European Union Law is incorporated in the Swedish legal system.

5. Data Collection

The sample used in this study consists of the firms listed on the OMX Stockholm (OMXS) which in total are 288. According to the industry classification which is presented on Table 1, the companies are divided into ten industries. The firms from Financial Industry such as Banks, Insurance Companies, Real Estate Investment and other financial companies are excluded from the sample, because of their special financial structure. The names of the excluded financial companies from the original sample of 288 firms are presented on Table number 2.
The final sample of firms that we take into consideration consists of 233 firms. The chosen sample period ranges between the years 2002-2012 and we use annual data for macroeconomic factors and the firm-specific variables. The source of the collected data is Thomson Reuters Datastream.
As far as outliers are concerned, their influence is not considered to be substantial, especially for macro-economic variables, since our study uses ratios. As for the firm-specific variables, especially for the leverage ratios, there were detected some outliers, most of them extremely high. We used the Microsoft Excel function "if" to detect and remove outliers from the data.
The function treated all the ratios more than ±5 as outliers. Also, negative ratios, which were counter to the logic of the ratio (e.g Dividend payout ratio cannot be negative) were treated as well.

5.1 Variables Specification

The variables used in this study are based on theoretical foundations suggested by capital structure theories as well as on previous studies. We transformed existing models by employing new variables. Most of the studies that investigate this field, try to use new, unique variables as determinants of capital structure, in order to contribute to the research. As Harris and Raviv (1991) show in their article, the motives and the considerations that could determine the capital structure choices seem nearly uncountable. However, there are some determinants of capital structure that are most commonly used.

The majority of the studies use firm specific variables in order to determine the capital structure preference, while others use macroeconomic variables as well. According to Oxelheim (1999: p.69) "*The corporate view on the magnitude and extent of influence of macroeconomic factors has grown gradually, which has biased the company's way of*

handling these factors". In our paper, we mainly use macroeconomic variables, including some firm specific variables at the same time (see variables description on Table 3).

5.1.1 Dependent Variables

The dependent variable in our model is the measure of leverage. Taking into consideration the differences in the composition of liabilities, we choose Total Debt to Common Equity ratio as a measure of leverage. Other leverage ratios such as Debt to Total Capital ratio, Debt to Total Asset ratio, Short-term debt to Equity ratio and Long-term to Equity ratio are also included for comparison reasons with the main leverage measure, in order to check that results of our leverage measure are not special to the chosen time period. We use book values, rather than market values, since the difference between leverage ratios measured by book and market value is due to variations in stock prices rather than firm's financing decision. We support this statement by Asgharian's (1997:60) study, where it is concluded that: "*A comparison of the results obtained for leverage ratios based on book and market values of equity indicated that there may be a positive correlation between the market value of equity and the explanatory variables, such as collateral value of assets, manager's shareholding and dividend payments. This finding questions the adequacy of using the market value of equity in the leverage ratio"*.

5.1.2 Explanatory Variables

The explanatory variables in the model are both firm and time variant. The firm-specific variables, such as the size and the type of the assets are almost invariant over time. They are not included in the model, because these variables may result in a multicollinearity problem, and their coefficients will not be estimable (Hsioa, 1986).

Profitability Ratio

We use profitability ratio as an explanatory variable in our model, because according to Pecking Order theory, an internal source of financing decreases the requirement for external financing. Therefore, profitability should be considered as one of the firm-specific explanatory variables. Rajan and Zingales (1995), as well as Asgharian (1997) find that there is an inverse relation between leverage and profitability, with Asgharian (1997:100) explaining that this *"may simply arise from the fact that profit in each year is added to the value of equity in that year"*. On the contrary, the Free Cash Flow theory and the Asymmetric Information theory find a positive relation between profitability and debt ratio. In the first case, more debt means more disciplined managers and reduced agency cost of free cash flow, while in the second case, profitability and leverage give a sign of a highly efficient company. We define profitability as the ratio of the operational profit to total revenue. We use the profit before financial items as a measure of our profitability, in order to avoid the direct effect of leverage on financial costs.

Dividend Payment Ratio

We use dividend payment ratio as a firm-specific explanatory variable, since dividend reduces internally available funds and thus increases the demand for external financing. According to Allen (1993) and Chang and Rhee (1990), dividend payment has a positive effect on leverage. On the other hand, Rozeff (1982) and Mackie-Manson (1990) and Asgharian (1997) findings show a negative relationship between leverage and dividend payment. We define dividend payment ratio as the total cash dividend over the Net Income.

Stock Price performance Ratio

We use stock price volatility (the percentage change in stock prices) as a proxy for market performance. Asgharian (1997) and Dimitrov and Jain (2008) in their studies find negative relationship between market performance and leverage ratios. Firms tend to issue equity in the favorable stock market conditions; therefore we employ this ratio as a potential determinant of the capital structure decision for Swedish firms and also predict that this variable should be negatively correlated with the leverage ratio.

GDP Growth

Many studies use GDP growth rate as a determinant of capital structure. The growth rate of GDP is argued to measure how much easier it will be for firms to service debt costs in the future. In previous studies, which are mainly undertaken in developing countries, the Growth Rate has an inverse and significant relation with the capital structure preference Bokpin, (2009); Dincergok & Yalciner, (2011). Booth et al. (2001) paper, which focuses on the capital structure determinants in developing countries, finds that the economic growth development is positively related to the total debt and the long-term book-debt ratio. During economic growth, the debt in the capital structure tends to increase in firms operating in developing countries. However, Gajurel (2005) concluded that the macroeconomic conditions have a significant influence in the financing decision and that GDP growth rate is inversely related to the level of debt on the capital structure.

Inflation Rate

Another important explanatory factor is the inflation rate. The findings here seem to differ substantially with each other. For example, Bastos, Nakamura & Basso (2009) argue that inflation does not influence the capital structure, whereas Murray & Goyal (2009) find a relation between inflation and the market leverage, without though finding an effect on the book leverage. Moreover, Camara (2012) shows that the macroeconomic conditions,

including the inflation rate, have a significant relation with capital structure. Sett & Sarkhel (2010), Hanousek & Shamshur (2011) also argue that inflation has a strong and positive impact on the capital structure. Apart from that, Gajurel (2006) finds that inflation is negatively related to the total leverage and the short-term debt ratio, but has a positive influence on the long-term debt ratio.

Interest Rate

Interest rate, on the other hand, seems to affect the corporate capital structure in a positive and significant way Bokpin (2009). However, Dincergok & Yalciner (2011) support that the interest rate and the capital structure is not positively related.

Corporate Tax Rate

The Tax rate is also considered one of the determinants of capital structure. For those firms, that are able to utilize interest payment deductibility, a decrease in the corporate tax rate means a diminished benefit of debt financing. In his paper, Myers (2003) concludes that despite the existence of some tax-driven financing methods (for example: financial leases), it is difficult to show in a clear way that taxes do have a considerable effect on the financing options.

Exchange Rates

Exchange rate can also be one of the determinants of capital structure because Swedish economy is largely export-reliant and as a result the majority of its trade settlements are in foreign currencies. Also, Swedish firms are internationally represented and have access to international capital markets and financial institutions. Therefore, currency fluctuations can affect the capital structure of firms with large foreign debt. Having said that, we consider that it is reasonable to ask if or how firms with these characteristics use leverage in order to mitigate their exposure to international exchange rate fluctuations.

Banking Loan to Non-financial Private Sector % GDP

Rajan and Zingales (1995) argue that a measure of the importance of the banking sector in the firms' choice of the financing policy is the ratio of bank loans made to private sector over GDP. In their studies, they conclude that this ratio is more important and substantial in Bank-oriented economies.

6. Regression Model

According to empirical studies conducted previously, there is evidence that there is a relationship between macroeconomic variables and the capital structure of firms. Some of the empirical studies concentrate on identifying the firm specific factors that managers should pay attention to when making the capital structure choice, while they underestimate the possible implications of macroeconomic conditions that could affect the choice of financing mix. In this paper, we combine firm specific variables with macroeconomic ones, in order to control for the possible implications of such factors on capital structure decisions. Our period of interest is between 2002 -2012.

A Panel Data is used to analyze the impact of macroeconomic variables on Capital Structure. We use Panel data, because it increases on the degrees of freedom, deals with the collinearity issue among the explanatory variables (decreases it), and consequently allows for more efficient estimates. Both fixed and random effect panel data analyses are applied to deal with the firm heterogeneity, which may be caused by characteristics that differ among firms but are invariant over time. Problems such as heteroscedasticity and multicollinearity are also taken into consideration.

We follow the setup and let the leverage ratio for firm i=1,…,N, at time t=2002,…,T, be denoted as y_{it} .Specifically, in this model the leverage ratio should vary across firms and over time. Since the macroeconomic factors determining the firms' optimal leverage may change over time, it is possible that the Capital structure itself may also move over time for the same firm. We denote firm-specific variables as "*F"* and macroeconomic variables as "*M*" in our model below (1). In this model, firm specific variables vary across time and firm while macroeconomic variables are the same for every firm, but vary across time. The model is specified as follows:

$$y_{it} = \alpha + \sum_{k=1} \beta_k F_{k,it} + \sum_{j=1} \gamma_j M_{j,t} + u_{it} \qquad (1)$$

The capital structure of any company is measured in terms of its leverage ratios. The debt-to-equity ratio is a financial ratio which describes the amount of debt and equity used in the financing of a company. In this study, the capital structure of the firms is measured in terms of Debt to Equity Ratio. Apart from this ratio, we also use the Total Debt to Total Capital and the Total Debt to Total assets ratio for better comparative results. In addition to these ratios, we also include the Long Term Debt to Equity and the Short Term Debt to Equity ratios in order to check if there is any substantial difference according to the time length.

A pooled regression has some restricted assumptions which imply no cross-sectional heterogeneity and no period effects. In particular, a pooled regression assumes that the estimated coefficients are the same for each cross-section (firms) and over the years. "*OLS specification assumes that all the explanatory variables are strictly exogenous. However, this is a naive presumption since the random events affecting the dependent variable are likely to influence the explanatory variables as well*" Antoniou et al. (2008:11). This means that it is

necessary to account for heterogeneity in the data, because everything that is not explained in a pooled regression is transferred to error terms. Cross section and period heterogeneity are tested further on by running different models.

6.1 Fixed Effects Model

In the regression equation (1), the disturbance term u_{it} could be decomposed in an individual entity-specific effect μ_i, and a remainder disturbance, v_{it}. The residual u_{it} contains the effects of all the unobserved variables that are not included in the regression and varies over time and across entities. Consequently, the disturbance term u_{it} may be defined as:

$$u_{it} = \mu_i + v_{it}$$

So, we can rewrite equation (1). First we simplify our notation of firm specific "*F*" and macroeconomic variables "*M*" with x_{it} (1×k vector of explanatory variables) and then we substitute with the new definition of u_{it}.

$$y_{it} = \alpha + \beta x_{it} + \mu_i + v_{it} \qquad (2)$$

Where $v_{it} \sim IDD(0, \sigma_v^2)$

There are several strategies available for estimating the fixed effect models. The Least Square Dummy Variable model (LSDV) is the model that is used more due to its easy estimation and its concrete interpretation. The Dummy variable representation of the fixed effects model is just a standard regression model and can be estimated by OLS.

$$y_{it} = \beta x_{it} + \mu_1 D_{1i} + \mu_2 D_{2i} + \cdots + \mu_N D_{Ni} + v_{it}$$

,where D_{1i} constitutes a dummy variable that is equal to 1 for all observations that are on the first entity (e.g. the first firm) of the sample and zero otherwise, D_{2i} is a dummy variable that takes the value 1 for all observations on the second entity (e.g. the second firm) and zero otherwise, and so on. When the number of cross-sectional units (firms) in the panel data is large, LSDV displays some weaknesses. If time is fixed and the number of the cross-sectional units (firms) goes to the infinity, only coefficients of repressors are consistent. The dummy variables coefficients are not characterized by consistency since these parameters increase with the increase of the number of the units Baltagi (2001). In this panel data, time dimension (T) is small. It contains only the period from 2002 – 2012 while the number of cross-section units is pretty large (233). Therefore, a lot of parameters need to be estimated, resulting in a huge loss of degrees of freedom. Hence, Within Transformation method helps to save more degrees of freedom since it is not necessary to estimate that many dummy variables parameters. Thus, the standard errors for each dependent variable are smaller than in the

Least Squares Dummy Variable (LSDV) regression. Consequently, the estimates are more precise and the slopes of non-dummy independent variables are identical. The between transformation effect model also does not use dummies but produces different parameter estimates. To check whether Fixed effects model output is well specified, we use Redundant Fixed Effects tests.

6.2 Random Effects Model

Another way to account for heterogeneity is to run the random effects model. The Random Effects model, which is equivalent to the Generalized Least Square (GLS), needs to follow some severe restrictions in order to be applied in our regression. According to this method, the subtraction of the necessary mean value seems to be a better and more advanced solution than subtracting the whole mean value over all the cross-section units. Therefore, using the Random effect model we do not lose any degrees of freedom, since we do not use more variables, we just make transformations, so it is more efficient than the dummy fixed test. The problem of the Random effect model is that it follows a severe restriction since it is necessary for the independent variables to be exogenous ($Cov(\mu_i, x_{it}) = 0$), so as not to have biased and inconsistent estimates. As it follows, we are going to run a Hausman Test to check the applicability of the Random model. Furthermore, if we reject the null hypothesis of Hausman Test, we will use the fixed effect model.

$$y_{it} = \alpha + \beta x_{it} + \epsilon_i + v_{it} \qquad (3)$$

Where $\omega_{it} = \epsilon_i + v_{it}$, $\epsilon_i \sim IDD(0, {\sigma_\epsilon}^2)$ and $v_{it} \sim IDD(0, \sigma_v^2)$

The μ_i are independent of the v_{it} and both ϵ_i and v_{it} are independent of the x_{it}.

According to Brooks (2008, p. 498-499) the transformation involved in this GLS procedure is to subtract a weighted mean of the y_{it} , over time (i.e. part of the mean and not the whole mean, as was the case for fixed effects estimation). The 'quasi-demeaned' data is defined as $y^* = y_{it} - \theta \bar{y}_i$ and $x^* = x_{it} - \theta \bar{x}_i$, where $\bar{y}_i$ and $\bar{x}_i$ are the means over time of the observations on y_{it} and, x_{it} respectively. θ is a function of the variance of the observation error term, σ_v^2 , and of the variance of the entity-specific error term, σ_ϵ^2.

$$\theta = 1 - \frac{\sigma_v}{\sqrt{T\sigma_\epsilon^2 + \sigma_v^2}}$$

This transformation will ensure that there are no cross-correlations in the error terms.

The standard error-components models assume that there is heterogeneity between entities in the cross-sectional dimension, causing errors to be correlated within cross-sectional units like firms in our data. In a similar way, we could also have "heterogeneity" in the time dimension. We can easily allow for time variation, as for cross-sectional variation, in the random effects model

$$y_{it} = \alpha + \beta x_{it} + \epsilon_t + v_{it} \quad (4)$$

Where $\omega_{it} = \epsilon_t + v_{it}$

7. Results of the Regression Specification

Firstly, a pooled regression is estimated (see Appendix A_1). It can be seen that P-values are significant for Bank Credit % GDP (CREDIT_GDP), Inflation Rate (INF_RATE), Interest Rate (INT_RATE) and Stock Price Performance (STOCK_PER_RATIO). *Bank Credit % GDP* and *Inflation Rate* are statistically significant at 5% significance level, while *Interest Rate* and *Stock Price Performance* are significant at 1% level of significance. All the significant variables, except for *Inflation Rate*, have positive effects on *Debt to Equity ratio*.

A noticeable problem is the low value for Durbin-Watson statistic (0.6337) which might imply autocorrelation or some specification errors.
An extended Chow test (Test for poolability) could be used to check whether a pooled regression is appropriate or not. Since our data is missing many observations, and there are too many cross-sectional units (233 firms) in the sample, we choose another method to check for heterogeneity. The Graph of residuals from the pooled regression (Appendix A_2) shows a noticeable tendency in the residuals (variation below and above zero is in a systematical way), which indicates possible Heterogeneity.

A pooled regression is characterized by the restricted assumptions of no cross-sectional (firms) heterogeneity and no period effects. Particularly, a pooled regression makes the assumption that the estimated coefficients are the same for each cross-section and over the years. One of the assumptions of the OLS specification is the strict exogeneity of the explanatory variables. However, this could be a simplistic presumption since the random events affecting the dependent variable are likely to influence the explanatory variables as well. This means that it is necessary to account for heterogeneity in the data, because everything that is not explained in a pooled regression is transferred to error terms.

In this particular panel data there are 233 firms and only a short sample period 2002-2012 with missing observations. It can be suggested that cross-sectional dimension is important and it is optional to account for heterogeneity in the period dimension. The Cross section and period heterogeneity are tested further on by running different models. Figure 1 presents an overview of all the tested models. Due to unbalanced data we cannot estimate a combination of fixed and random effects as well as two-way random effects model.

Figure 1

Cross-Section Dimantion	Period Dimension: Fixed	Random	None
Fixed	"Neat Singular Matrix" Error	Not Possible with Unbalance Data	R-sqrd 0.59, F-test 7.005, CREDIT_GDP, INF_RATE and INT_RATE significant
Random	Not Possible with Unbalance Data	Not Possible with Unbalance Data	R-sqrd 0.04, F-test 3.47, CREDIT_GDP, INF_RATE, INT_RATE and STOCK_PER_RATIO significant
None	"Neat Singular Matrix" Error	R-sqrd 0.035, F-test 3.15, CREDIT_GDP, INF_RATE, INT_RATE and STOCK_PER_RATIO significant	R-sqrd 0.035, F-test 3.15, CREDIT_GDP, INF_RATE, INT_RATE and STOCK_PER_RATIO significant

7.1 Cross-Section Fixed effects Model

To begin with our model, Appendix A_3 depicts Cross-Section fixed Effects model with Least Square Dummy Variable (LSDV) representation. It can be observed that only Bank *Credit % GDP* and *Inflation Rate* are statistically significant at 5% significance level while *Interest Rate* at 1% level of significance. *Stock Price Performance* is insignificant as compared to the results of pooled regression. In order to test whether the Cross-Sectional Fixed Effects model is well specified, we run the Redundant Fixed effects test, as it is presented in Appendix A_3.1. The P-value of the cross-section F-test is zero with four decimals, indicating that the coefficients of the dummy variables used in the fixed effects model are statistically significant. Therefore, the Pooled regression cannot be used because the dummy variables have some explanatory power in the cross-section fixed effects model.

7.2 Cross-Section Random effects Model

According to Appendix A_4, which presents the Cross-Section Random Effects model, *Bank Credit % GDP*, *Inflation Rate* and *Interest Rate* are statistically significant at 1% significance level, *Stock Price Performance* at 5% level of Significance, while *GDP growth rate* at 10% level of significance. In order to test whether Cross-Section Random Effects model is well specified, we run Hauseman test (Appendix A_4.1) for the random effects being uncorrelated with the explanatory variables. According to the P-Value (*0.0536*) of chi-square test, we accept the null hypothesis that the model is well-specified.

7.3 Period Random effects Model

According to Appendix A_5, which is concerned with the Period Random Effects model, only *Bank Credit % GDP* and *Inflation Rate* are statistically significant at 5% significance level, while *Interest Rate* and *Stock Price Performance* at 1% level of Significance. In order

to test if the Period Random Effects model is well specified, we run a Hauseman test (Appendix A_5.1) for the random effects being uncorrelated with the explanatory variables.
According to the P-Value (*0.8198*) of the chi-square test, we accept the null hypothesis that the model is well-specified.
Figure 2 shows the summary of the all the regressions that we made, including the Pooled regression.
Figure 2

	C	CREDIT_GDP	CTAX_RATA	DIV_PAY_RATIO	GDP_G_RATE	INF_RATE	INT_RATE	KRONA_EUR_RATE	KRONA_USD_RATE	PROF_RATIO	STOCK_PER_RATIO
Cross-Section Fixed Effects	-0.3324	0.4542	-1.2868	0.0002	1.2789	-6.4723	12.5980	0.0096	0.01901	-0.04318	0.4222
(P-Values)	*(0.5164)*	*(0.0117)*	*(0.3438)*	*(0.8619)*	*(0.1800)*	*(0.0169)*	*(0.0007)*	*(0.7789)*	*(0.4840)*	*(0.2637)*	*(0.2721)*
Cross-Section Random Effects	-0.5080	0.4871	-1.0293	-1.63E-05	1.5115	-7.2155	13.7251	0.0070	0.0231	-0.0005	0.6838
(P-Values)	*(0.3140)*	*(0.0057)*	*(0.4439)*	*(0.9895)*	*(0.0982)*	*(0.0066)*	*(0.0002)*	*(0.8355)*	*(0.3903)*	*(0.9868)*	*(0.0276)*
Time Period Random Effect	-0.8191	0.5624	-0.4060	-0.0008	2.1345	-8.9114	16.9817	0.0086	0.0314	0.0454	0.7594
(P-Values)	*(0.2309)*	*(0.0184)*	*(0.8258)*	*(0.5994)*	*(0.1043)*	*(0.0150)*	*(0.0007)*	*(0.8509)*	*(0.4019)*	*(0.1347)*	*(0.0034)*
Pooled Regression	-0.8191	0.5624	-0.4060	-0.0008	2.1345	-8.9114	16.9817	0.0086	0.0314	0.0454	0.7594
(P-Values)	*(0.2304)*	*(0.0183)*	*(0.8255)*	*(0.5990)*	*(0.1039)*	*(0.0149)*	*(0.0007)*	*(0.8507)*	*(0.4013)*	*(0.1342)*	*(0.0033)*

7.4 Multicollinearity and Heteroscedasticity

Two other important points to consider are testing for multicollinearity and heteroskedasticity in our panel data. Firstly, according to the Appendix A_6, it can be observed that there is no sign of multicollinearity between the explanatory variables, as none of the correlation coefficients is equal or bigger than 0.8.
Then, we consider the problem of heteroskedasticity and in order to see if the variances of the residual values are constant we choose to run the Breusch-Pagan-Godfrey (BPG) test as we see in Appendix A_7. The results show a statistically insignificant p-value (*0.5347*) at the 5% significance level. Therefore, we can accept the null hypothesis that the disturbance terms are homoscedastic.

7.5 Choice of the model

According to the results of Redundant and Hauseman tests, Cross-section Fixed effect, Cross-Section Random effects and Time Period Random Effects models are accepted. Generally, the random effect model is preferred to the fixed effect model since it is more efficient and it corrects the model only by the necessary amount that is needed to get rid of within-cross-section (or within-period) correlation between the residuals. So, we shall proceed with Random effects models.

Now, we have to choose between Random Cross-sectional and Period models. We consider that the cross-sectional (Firms) dimension as more important than the period dimension in

our sample since there are 233 firms (Cross-section units) and only 11 years (Periods), in which some observations are absent. Also, Figure 2 clearly shows that with the Cross-Section Random effects model, the *Bank Credit % GDP*, *Inflation Rate* and *Interest Rate* variables are statistically significant at 1%, the *Stock Price Performance* at 5% and the *GDP growth rate* at 10% level of significance. Whereas, for the Period Random Effects model, only the *Interest Rate* and the *Stock Price Performance* variables are statistically significant at 1% level of significance, while *Bank Credit % GDP* and *Inflation Rate* are statistically significant at 5% level of significance.
Considering this, we use Cross-Section Random Effects model for further analysis.

7.6 Analysis of the Results

Our findings show that there is a relation between macroeconomic elements and the capital structure of the Swedish firms. More specifically, we find that the capital structure is affected by macroeconomic factors such as *Inflation, Interest Rate, Banking Credit over GDP and GDP growth rate*. We can also see that from the firm specific variables that we included in the model, only the *Stock price performance ratio* is significant with 5% level of significance.

In addition to Debt to Equity ratio as a measure of leverage, we also use other leverage measures in order to check that the result of leverage measure is not special to the chosen time period. The results of those leverage ratios, such as Debt to Total Capital ratio, Debt to Total Asset ratio, Short-term debt to Equity ratio and Long-term to Equity ratio are presented on Table 3.

One important finding is the significance of the *Banking Credit as % of GDP* variable. This variable according to Rajan and Zingales (1995) is a measure of the importance of the banking sector in the process of selection type of financing for a firm. This variable is also significant for other leverage measures such as Total Debt to Equity ratio and Total Debt to Assets ratio. Results in Table 3 show that the *Banking Credit as % GDP* variable is positively related to the leverage measures, which is not a surprising outcome even from a theoretical point of view.

Since, in bank oriented economies banks provide most of the credit, business loans require banks to control the activities and management of a firm, implying the costly collection of inside information. On the other hand, potential advantage of monitoring and access to inside information is the development of long term relationships between banks and borrower firms. This has particular importance during financial crisis or macroeconomic shocks. During a crisis, banks' access to inside information allows them to continue lending to financially credible firms, while financial markets are illiquid. This suggests that firms from bank oriented economies might suffer less from global financial crisis. The importance and impact of banking sector on Swedish economy, as well as the other factors discussed in section 4, have contributed to the so-called soft landing of the Swedish economy during the financial crisis of 2008.

The sharp rise of the mean leverage measure for Swedish firms (Table 5) can be observed during the financial crisis of 2008, even though the median leverage ratio for the same time period is reduced. By analyzing the leverage measure by industry (Table 6), we conclude that despite the financial crisis, the increase in mean leverage derives from the bank's access to inside information and lending to financially sound firms.

Moreover, as we can see on Table 3, *Inflation Rate* is significant and negatively associated with the total leverage ratio and significantly positive with the long term ratio. However, we do not find any significance with the short term debt. This result is consistent with Gajurel's (2006) study and contradictory to Sett & Sarkhel (2010), Hanousek & Shamshur (2011) papers that support a positive relation between Inflation rate and leverage. From these results we conclude that an increase in inflation rate leads to an increase in long term debt and to a decrease of the total debt.

As far as *Interest Rate* is concerned, we find that it significant at 1% level and positively correlated with the leverage measure, as Bokpin (2009) suggests in his study. We have the same relationship for debt to capital and debt to assets ratios. As for the long term debt to equity ratio, we find it significant at 10% level and with inverse relationship to interest rate, which goes in line with Dincergok & Yalciner (2011) findings.

Stock Price Performance is statistically significant at 5% level of significance and affects the total leverage in a positive way. Table 3 shows that debt to capital and debt to asset ratios are also significant and positively affected by *Stock Price Performance.* However, we do not find any significance considering the short or the long term debt. This result is not in line with Asgharian (1977) and Dimitrov and Jain (2008), who fined a negative relation between leverage and Stock price performance.

An important variable is *GDP growth Rate* which is considered to be a reflection of all the other variables. We find it significant at 10% level and positively related to Debt to equity, debt to capital and debt to assets ratios. Our findings are consistent with Booth et al (2001), Stulz (1990) studies. Bokpin (2009), Dincergok and Yalciner (2011) and Gajurel (2005) in their paper find negative relationship with leverage measures. A possible explanation for this finding, could be the fact that their study is conducted for companies that operate in developing countries. An increase in GDP growth rate signals a positive effect on the firm's earnings, which means more internally available funds, therefore, in developing countries companies react to GDP growth rate inversely, as it is shown in the studies of Bokpin (2009), Dincergok and Yalciner (2011) and Gajurel (2005). As far as developed economies are concerned, an increase in GDP growth rate may signal ease of servicing the debt in the future, thus engaging in the value maximizing activities with leverage.

Considering the variables that are insignificant, we can say that the insignificance of *Corporate Tax Rate* is consistent with Myers (2003), whereas the insignificance of the

Profitability and Dividend Payout is inverse to other studies that, as mentioned in section 5, consider them positively or negatively related to leverage.

Furthermore, both Exchange *Rate (SEK/EUR)* and Exchange *Rate (SEK/USD)* are not significant, despite the access of Swedish firms to international capital markets, the export reliance of the economy and the international transactions that this implies. On a relative study, which relates the movements in the exchange rate with the firms' value, Nydahl (1999) finds that the Swedish firms' stock price is quite sensitive to exchange rate fluctuations, compared for example to U.S. firms. Moreover, Bartov and Bodnar (1994), argue that the selection of the sample is a crucial element when investigating the exchange rate exposure of the companies. According to them, it is important to choose companies that would be affected, in the same way, in the case of currency appreciation or depreciation. So, one reason that the exchange rate variable is insignificant in our paper could be the inclusion on the sample of firms that possess large debt in foreign currencies and of firms that do not have this characteristic. Moreover, other studies, such as Allayannis and Olek (1996), mention that firms use hedging instruments (e.g. currency derivatives) in order to be protected against exchange rate changes. This could also be one of the reasons that in our study, Swedish companies' capital structure is not affected by the exchange rate changes. In addition, the fact that some Swedish companies have established some part of their production lines in other countries, could be a natural hedge towards the exchange rate fluctuations.

8. Conclusion

In this study, we prove the relation of some macroeconomic variables with the capital structure of Swedish firms and provide evidence that Rajan and Zingales's (1995) argument about the importance of the *Bank credit as percentage to GDP* variable for bank oriented economies, is credible, since we find that it is significant and positively related to the leverage measures. Using unbalanced panel data for 233 firms, for the 2002-2012 sample period and by using a Random Effects model, we find that four (GDP growth rate, Inflation Rate, Interest Rate, Bank credit as % GDP) out of the seven macroeconomic variables used in our regression model are significant. On the other hand, from the three firm-specific variables, Stock price performance is the one that is significant.

By describing the distinct characteristics of the Swedish economy in section 4, we show that the results of other studies related to bank oriented economies cannot be generalized on the Swedish case. Therefore, our study contributes to the knowledge by identifying the macroeconomic determinants of capital structure and by providing the proof that the banking sector is important for the Swedish companies and that does affect their financing decision in a positive way.

The result of this study is valuable for the Swedish firms, since identifying the way that macroeconomic factors affect the capital structure will give them the advantage of formulating an effective financing policy as well as predict their competitors' reaction to the market changes.

For the future research, it would be interesting to incorporate in the regression model variables that reflect the legal and financial traditions of Sweden. This would be a valuable contribution to the literature, since as we mention above, the capital structure decision of a company is determined not only by its specific characteristics and the macro-economy but also by the institutional and financial traditions under which it operates.

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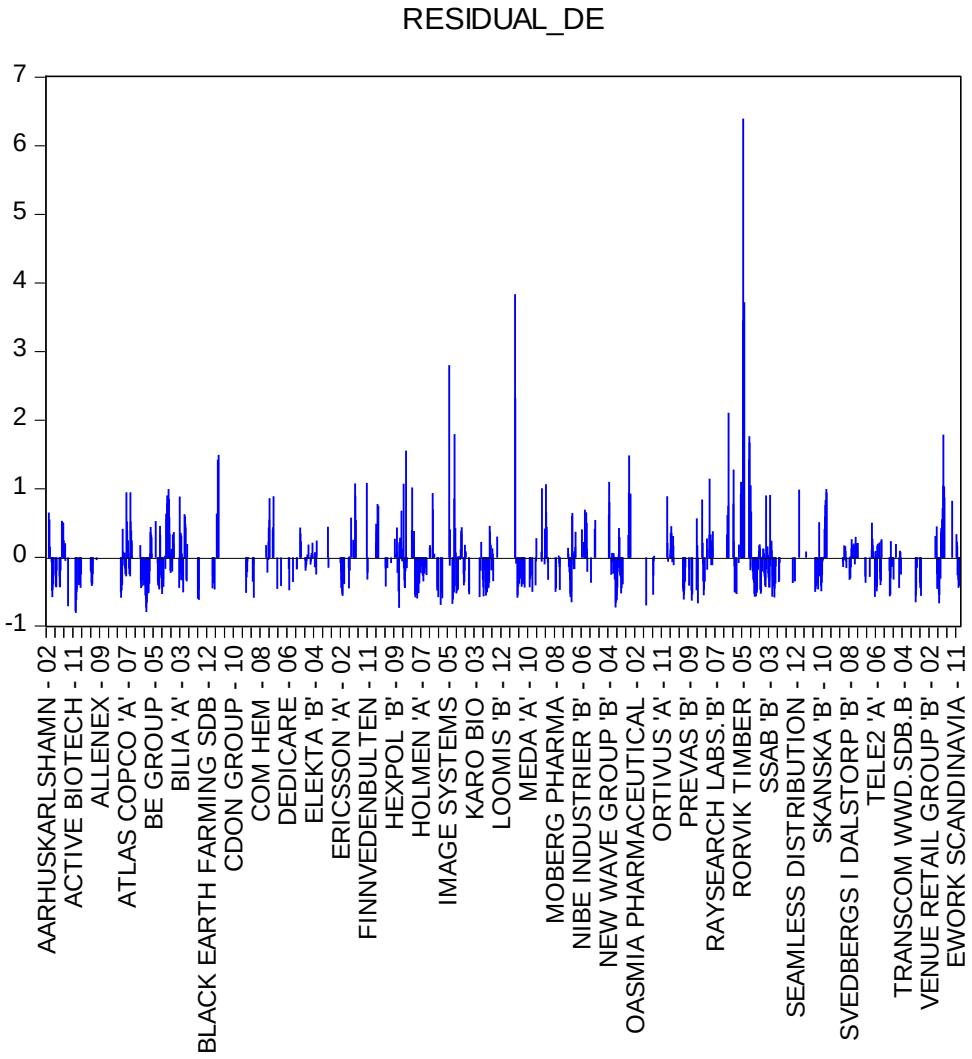
APPENDIX A

Appendix A_1: Output of the Pooled Regression

Variable	Coefficient	Probability
C	0.819171	0.2304
Bank Credit as % to GDP	0.562421	0.0183
Corporate Tax Rate	0.406020	0.8255
Dividend Payout Ratio	0.000828	0.5990
GDP Growth Rate	2.134573	0.1039
Inflation Rate	8.911492	0.0149
Interest Rate	16.98176	0.0007
Krona/Euro Exchange Rate	0.008692	0.8507
Krona/USD Exchange Rate	0.031497	0.4013
Profitability Ratio	0.045481	0.1342
Stock Price Performance	0.759475	0.0033
R-Squared		0.034981
Probability (F-Statistic)		0.000568
Durbin-Watson Stat.		0.633750

The table depicts the output of the pooled regression from the "EViews 8" software. It is observable that P-values are significant for Bank Credit % GDP (CREDIT_GDP), Inflation Rate (INF_RATE), Interest Rate (INT_RATE) and Stock Price Performance (STOCK_PER_RATIO). Bank Credit % GDP and Inflation Rate are statistically significant at a 5% significance level, while Interest Rate and Stock Price Performance are significant at a 1% level of significance. The low value for Durbin-Watson statistic (0.6337) might imply autocorrelation or some specification errors.

Appendix A_2: Residuals of Pooled Regression



The Graph of residuals from the pooled regression shows a noticeable pattern in the residuals. Variation below and above zero is in a systematical way, which indicates possible Heterogeneity.

Appendix A_3: Output of a Model with Cross-Section Fixed Effects

Variable	Coefficient	Probability
C	-0.332439	0.5164
Bank Credit as % to GDP	0.454213	0.0117
Corporate Tax Rate	-1.286831	0.3438
Dividend Payout Ratio	0.000217	0.8619
GDP Growth Rate	1.278968	0.1800
Inflation Rate	-6.472365	0.0169
Interest Rate	12.59801	0.0007
Krona/Euro Exchange Rate	0.009696	0.7789
Krona/USD Exchange Rate	0.019017	0.4840
Profitability Ratio	-0.043186	0.2637
Stock Price Performance	0.422204	0.2721
R-Squared		0.594267
Probability (F-Statistic)		0.000000

Appendix A_3.1: Redundant Test for Cross-section Fixed Effects Model

Effects Test	Statistic	d.f.	Probability
Cross-Section F	7.057322	(142.727)	0.0000
Cross-Section Chi-Square	762.478472	142	0.0000

To test whether the Cross-Sectional Fixed Effects model is well specified, we run the Redundant Fixed effects test. The P-value of the cross-section F-test is zero with four decimals (0.0000), indicating the significance and the applicability of the Cross-section fixed effects model specification.

Appendix A_4: Output of a Model with Cross-Section Random Effects

Variable	Coefficient	Probability
C	-0.508092	0.3140
Bank Credit as % to GDP	0.487123	0.0057
Corporate Tax Rate	-1.029308	0.4439
Dividend Payout Ratio	-1.63E-05	0.9895
GDP Growth Rate	1.511533	0.0982
Inflation Rate	-7.215562	0.0066
Interest Rate	13.72516	0.0002
Krona/Euro Exchange Rate	0.007023	0.8355
Krona/USD Exchange Rate	0.023191	0.3903
Profitability Ratio	-0.000518	0.9868
Stock Price Performance	0.683815	0.0276

Appendix A_4.1: Hausman Test for Cross-section Random Effects Model

Test Summary	Chi-Squared Statistic	Chi-Squared d.f.	Probability
Cross-Section Random	18.082310	10	0.0536

To test whether the Cross-Section Random Effects model is well specified, we run the Hauseman test for the random effects being uncorrelated with the explanatory variables. According to the P-Value (0.0536) of the chi-square test, we cannot reject the null hypothesis. Therefore, we accept the null hypothesis that the Cross-sectional Random Effects model is well-specified.

Appendix A_5: Output of a Model with Time Period Random Effects

Variable	Coefficient	Probability
C	-0.819171	0.2309
Bank Credit as % to GDP	0.562421	0.0184
Corporate Tax Rate	-0.406020	0.8258
Divident Payout Ratio	-0.000828	0.5994
GDP Growth Rate	2.134573	0.1043
Inflation Rate	-8.911492	0.0150
Interest Rate	16.98176	0.0007
Krona/Euro Exchange Rate	0.008692	0.8509
Krona/USD Exchange Rate	0.031497	0.4019
Profitability Ratio	0.045481	0.1347
Stock Price Performance	0.759475	0.0034

Appendix A_5.1: Hausman Test for Time Period Random Effects Model

Test Summary	Chi-Squared Statistic	Chi-Squared d.f.	Probability
Period Random	0.923465	3	0.8198

To test if the Period Random Effects model is well specified, we run a Hauseman test for the random effects being uncorrelated with the explanatory variables. According to the P-Value (0.8198) of the chi-square test, we accept the null hypothesis that the model is well-specified.

Appendix A_6: Correlation Matrix

	Credit to GDP	C. Tax Rate	Div. Payout	GDP Growth	Inf. Rate	Int. Rate	SEK/EUR	SEK/USD	Prof. Ratio	Stock Perf.
1. Credit to GDP	1.0000									
2. Corporate Tax Rate	0.2735	1.0000								
3. Div. Payout Ratio	0.0073	0.0306	1.0000							
4. GDP Growth Rate	-0.2656	0.2507	0.0021	1.0000						
5. Inflation Rate	0.0471	-0.1318	0.0528	0.2260	1.0000					
6. Interest Rate	-0.4450	-0.3873	0.0483	-0.1946	0.6026	1.0000				
7. SEK/EUR Rate	0.2624	0.1366	-0.0264	-0.4371	-0.4714	-0.4154	1.0000			
8. SEK/USD Rate	-0.5139	-0.5740	-0.0368	-0.0483	-0.1898	0.0511	0.2407	1.0000		
9. Profitability Ratio	-0.0321	0.0107	-0.0156	-0.0061	0.0058	0.0312	-0.0076	6.14E-05	1.0000	
10. Stock Perf. Ratio	0.1641	0.0400	-0.0528	-0.1025	0.0412	-0.030359	0.1287	-0.0863	0.0104	1.0000

Correlation Matrix clearly shows that none of the explanatory variables' coefficients is higher than ± 0.8. Coefficients that are higher than ± 0.8 indicate a near multicollinearity problem, while those that are equal to 1 indicate perfect multicollinearity problem. According to this table, there is no Multicollinearity problem between the explanatory variables.

Appendix A_7: BPG Heteroscedasticity Test

Variable	Coefficient	Probability
C	-1.905023	0.3476
Bank Credit as % to GDP	0.589046	0.4046
Corporate Tax Rate	1.098625	0.8408
Dividend Payout Ratio	-0.001302	0.7806
GDP Growth Rate	-0.029995	0.9939
Inflation Rate	-11.21028	0.3017
Interest Rate	15.28547	0.3044
Krona/Euro Exchange Rate	0.085496	0.5332
Krona/USD Exchange Rate	0.019205	0.8632
Profitability Ratio	-0.043665	0.6281
Stock Price Performance	1.076297	0.1605
R-Squared		0.010225
Probability (F-Statistic)		0.534725

In order to see if the variances of the residual values are constant we choose to run the Breusch-Pagan-Godfrey (BPG) test. The results show a statistically insignificant p-value (0.5347) at the 5% significance level. Therefore, we can accept the null hypothesis that the disturbance terms are homoscedastic. The Data has no Heteroscedasticity problems.

Table 1. Industry Classification

Total Initial Sample (OMX Stockholm)*	***288***
Excluded Companies	
Financial Industry	**53**
Banks	6
Financial Services (Sector)	22
Non-Equity Investment Instruments	1
Real Estate Investment & Services	24
Errors	**2**
Total Number of Excluded Companies	***55***
Sample Companies by Industry Name	
Basic Material	20
Consumer Goods	31
Consumer Service	25
Health Care	32
Industrials	76
Oil & Gas	7
Technology	33
Telecommunication	7
Utilities	2
Total Number of Sample Companies	***233***

***OMX Stockholm (OMXS)**	
Mnemonic	LSWEALI
Market	Sweden
Currency	Swedish Krona
Source	Nasdaq OMX

Table 2. Names of the Excluded Financial Industry Firms

Banks	***Non-equity Investment Instruments***
NORDEA BANK	FENIX OUTDOOR INTL
SEB 'A'	
SEB 'C'	
SVENSKA HANDBKN.'A'	***Real Estate Investment & Services***
SVENSKA HANDBKN.'B'	ATRIUM LJUNGBERG 'B'
SWEDBANK 'A'	BESQAB PROJEKT & FASTIGH
Financial Services (Sector)	CASTELLUM
AVANZA BANK HOLDING	CATENA
BURE EQUITY	COREM PROPERTY GROUP
EAST CAPITAL EXPLORER	DIOS FASTIGHETER
INDUSTRIVARDEN 'A'	FABEGE
INDUSTRIVARDEN 'C'	FAST PARTNER
INTRUM JUSTITIA	FASTIGHETS BALDER 'B'
INVESTOR 'A'	HEBA 'B'
INVESTOR 'B'	HEMFOSA FASTIGHETER
KINNEVIK 'A'	HUFVUDSTADEN 'A'
KINNEVIK 'B'	HUFVUDSTADEN 'C'
LATOUR INVESTMENT 'B'	JM
LUNDBERGFORETAGEN 'B'	KLOVERN
MELKER SCHORLING	KUNGSLEDEN
MIDWAY HOLDINGS 'A'	PLATZER FASTIGHETER
MIDWAY HOLDINGS 'B'	SAGAX
NORDNET 'B'	SAGAX 'B'
NOVESTRA	TRIBONA
RATOS 'A'	VICTORIA PARK
RATOS 'B'	VICTORIA PARK B
TRACTION 'B'	WALLENSTAM 'B'
VOSTOK NAFTA INV.SDR	WIHLBORGS FASTIGHETER
ORESUND INVESTMENT	

Table 3. Variables description

Dependent Variables	Description
Debt to Equity	Ratio of Book Value of Debt over Common Equity
Debt to Total Capital	Ratio of Book Value of Debt over Capital (Total Debt + Equity)
Debt to Assets	Ratio of Book Value of Debt over Total Assets
Independent Variables	
GDP Growth Ratio	GDP Growth Rate (annual data)
Inflation Rate	Official Rate of Inflation
Interest Rate	The discount rate is a reference rate based on market interest rates and always follows general interest rates. It is based on the average of 6-monthly and 5-yearly rates (fixing) over the past quarter with a haircut of 2.5 percentage points.
Corporate Tax Rate	
Exchange Rate	SEK-USD and SEK-EUR exchange rates
Bank Credit as % of GDP	Credit to private non-financial sector from domestic banks as % of GDP
Profitability Ratio	Operating Profit over Revenue
Dividend Payout Ratio	Common and preferred dividends paid to shareholders over Net Income
Stock Price Performance	A measure of stock's average annual price movement to a high and low from a mean price for each year.

Table 4. Results of the Random effects models

Explanatory Variable	Total Debt/Equity	Long Term Debt/Equity	Short Term Debt/Equity	Total Debt/ Capital	Total Debt/Assets
GDP Growth Ratio	1.511533 (0.0982)	-20.27005 (0.1338)	1.090311 (0.7843)	0.789174 (0.0782)	0.635797 (0.0637)
Inflation Rate	-7.215562 *(0.0066)*	74.72598 *(0.0477)*	-2.763586 *(0.8022)*	-2.826287 *(0.0233)*	-2.400263 *(0.0119)*
Interest Rate	13.72516 *(0.0002)*	-89.09459 *(0.0838)*	0.429179 *(0.9774)*	6.118587 *(0.0004)*	4.508903 *(0.0006)*
Corporate Tax Rate	-1.029308 *(0.4439)*	1.228742 *(0.9478)*	-1.057834 *(0.8498)*	-0.214009 *(0.7339)*	-0.141143 *(0.7695)*
Exch. Rate SEK/EUR	0.007023 *(0.8355)*	-0.229924 (0.6280)	0.211285 (0.1318)	-0.003526 (0.8230)	-0.006524 (0.5885)
Exch. Rate SEK/USD	0.023191 *(0.3903)*	-0.086759 (0.8195)	-0.031290 (0.7844)	0.013272 (0.3005)	0.013033 (0.1840)
Bank Credit as % of GDP	0.487123 *(0.0057)*	-2.294341 *(0.3468)*	0.064158 *(0.9293)*	0.210087 *(0.0098)*	0.189616 *(0.0023)*
Profitability Ratio	-0.000518 *(0.9868)*	0.213181 *(0.4936)*	-0.864582 *(0.0020)*	0.028968 *(0.0053)*	0.020705 *(0.0092)*
Divident Payout Ratio	-0.0000163 *(0.9895)*	-0.001334 *(0.9346)*	-0.000625 *(0.8949)*	-0.000205 *(0.7034)*	-9.09E-05 *(0.8252)*
Stock Price Performance	0.683815 *(0.0276)*	0.932779 *(0.7209)*	0.426136 *(0.5930)*	0.213823 *(0.0152)*	0.186500 *(0.0057)*
Hauseman Test	18.0823	8.6724	3.041234	1.0622	1.0388
P-Value	*(0.0536)*	*(0.5634)*	*(0.9804)*	(*0.7862*)	(*0.7918*)

The Table reports the primary results of the regression analysis. The first three columns report the results for the Cross-Section Random Effects model, while the last two for the Period Random Effects model. Our main Leverage measure is Total Debt to Equity Ratio and the other leverage measures are used for comparison reasons with the Total Debt to Equity Ratio. The P-Values are reported, in italic, under the estimated coefficients.

Table 5. Summary of Selected Studies

Explanatory Variable	Debt to Equity Ratio	Positive Relation with Leverage	Negative Relation with Leverage	No Relation with Leverage
GDP Growth Ratio	1.511533 *(0.0982)*	Booth et al. (2001), Stulz (1990), Miller (1977)	Bokpin (2009), Dincergok & Yalciner (2011), Gajurel (2005)	
Inflation Rate	-7.215562 *(0.0066)*	Sett & Sarkhel (2010), Hanousek & Shamshur (2011)	Gajurel (2006)	Bastos, Nakamura & Basso (2009), Frank & Goyal (2009)
Interest Rate	13.72516 *(0.0002)*	Bokpin (2009)	Dincergok & Yalciner (2011)	
Corporate Tax Rate	-1.029308 *(0.4439)*			Myers (2003)
Exchange Rate: SEK/EUR	0.007023 *(0.8355)*			
Exchange Rate: SEK/USD	0.023191 *(0.3903)*			
Bank Credit as % of GDP	0.487123 *(0.0057)*			
Profitability Ratio	-0.000518 *(0.9868)*	Blazenko (1987), Jensen (1986), Hovakimian (2004)	De Jong and Veld (2001), Flannery and Rangan (2006), Rajan and Zingales (1995), Titman and Wessels (1998)	
Dividend Payout Ratio	-0.0000163 *(0.9895)*	Chang and Rhee (1990), Baskin (1989), Allen (1993)	Rozeff (1982), Mackie-Manson (1990), Asgharian (1997)	
Stock Price Perfomance	0.683815 *(0.0276)*		Asgharian (1997), Dimitrov and Jain (2008)	

Table 6. Descriptive statistics for Macroeconomic Variables

	Macroeconomic Variables						
	GDP Growth Rate	Inflation Rate	Interest Rate	Corporate Tax Rate	Exchange Rate SEK/EUR	Exchange Rate SEK/USD	Bank Credit as % of GDP
Mean	0.0224	0.0151	0.0233	27.3818	9.4089	7.5404	1.0618
Median	0.0300	0.0140	0.0200	28.0000	9.1438	7.1401	1.0491
St. Dev.	0.0298	0.0117	0.0110	0.8577	0.6471	1.1928	0.2125
Min.	-0.0498	-0.0050	0.0050	26.3000	8.8993	6.4632	0.7993
Max.	0.0628	0.0340	0.0425	28.0000	10.9925	10.4897	1.3318

This table presents the descriptive statistics for the macroeconomic variables used in the thesis. The content is the summary for annual data collected for the years 2002-2012.

Table 7. Descriptive Statistics for Firm-specific and Leverage Ratios

	Firm Specific Variables			Leverage Ratios		
	Profitability Ratio	Stock Performance Ratio	Dividend Payout Ratio	Debt to Equity Ratio	Debt to Capital Ratio	Debt to Assets Ratio
Mean	-0.0124	0.3430	0.1919	0.5774	0.3254	0.2244
Median	0.0574	0.3208	0.0549	0.4590	0.3165	0.2010
St. Dev.	0.4035	0.1151	0.3350	0.5026	0.2173	0.1611
Min	-4.7630	0.1388	0.0001	0.0001	0.0001	0.0001
Max	0.8027	0.7967	1.9456	3.3245	1.9072	1.0284

This table presents the descriptive statistics for the firm specific variables and leverage ratios used in our study. The content includes the summary for annual data selected for 233 firms listed on OMX Stockholm. As it is mentioned above, the sample period is from 2002-2012.

Table 8. Descriptive Stat. for Debt to Common Equity Ratio by Industries

Basic Material	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.65	0.63	0.56	0.51	0.55	0.86	0.97	4.83	0.69	0.73	0.87
Meadian	0.39	0.39	0.56	0.36	0.35	0.73	0.94	0.46	0.66	0.68	0.65
St. Dev	0.63	0.57	0.37	0.36	0.43	0.48	0.94	17.24	0.53	0.52	0.99
Min.	0.00	0.03	0.15	0.12	0.08	0.35	0.06	0.03	0.03	0.05	0.08
Max.	2.13	1.68	1.44	1.24	1.28	1.56	4.12	69.47	1.97	1.85	4.33

Consumer Goods	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.70	0.71	0.65	0.91	0.76	0.73	0.78	0.51	0.45	0.51	0.54
Meadian	0.56	0.65	0.71	0.65	0.49	0.63	0.74	0.52	0.46	0.50	0.56
St. Dev	0.33	0.34	0.28	0.85	0.72	0.62	0.58	0.31	0.24	0.25	0.26
Min.	0.22	0.06	0.03	0.29	0.04	0.00	0.02	0.01	0.00	0.00	0.03
Max.	1.37	1.34	1.11	3.32	3.60	1.84	2.23	1.20	1.00	0.98	0.98

Consumer Service	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.78	0.94	0.78	0.66	0.47	0.64	0.70	0.57	0.53	0.50	0.50
Meadian	0.88	0.63	0.58	0.46	0.25	0.35	0.65	0.60	0.46	0.38	0.22
St. Dev	0.52	0.62	0.64	0.67	0.49	0.79	0.58	0.44	0.51	0.47	0.54
Min.	0.00	0.08	0.06	0.02	0.04	0.01	0.00	0.03	0.02	0.02	0.01
Max.	1.95	2.19	2.44	2.37	1.82	2.67	2.29	1.46	1.95	1.47	1.86

Health Care	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.40	0.29	0.34	0.37	0.43	0.46	0.50	0.45	0.45	0.45	0.47
Meadian	0.19	0.07	0.14	0.15	0.16	0.16	0.27	0.26	0.30	0.27	0.44
St. Dev	0.53	0.49	0.40	0.47	0.54	0.54	0.49	0.46	0.42	0.45	0.37
Min.	0.01	0.01	0.02	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Max.	1.84	1.77	1.24	1.59	2.01	1.46	1.58	1.35	1.37	1.47	1.16

Industrials	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.71	0.76	0.65	0.62	0.57	0.74	0.78	0.75	0.70	0.71	0.81
Meadian	0.62	0.59	0.51	0.49	0.42	0.61	0.79	0.68	0.63	0.57	0.61
St. Dev	0.63	0.69	0.57	0.56	0.45	0.54	0.56	0.68	0.68	0.66	0.64
Min.	0.00	0.02	0.02	0.00	0.01	0.03	0.05	0.02	0.01	0.01	0.00
Max.	3.06	3.56	2.74	2.66	1.88	2.26	2.52	3.70	3.65	3.53	3.86

Oil & Gas	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.54	0.47	0.35	0.60	0.63	0.51	0.44	0.37	0.36	0.52	0.52
Meadian	0.44	0.47	0.35	0.20	0.83	0.51	0.38	0.32	0.30	0.21	0.32
St. Dev	0.58	0.66	0.30	0.77	0.40	0.31	0.28	0.37	0.38	0.62	0.68
Min.	0.01	0.00	0.14	0.11	0.16	0.29	0.20	0.03	0.01	0.12	0.04
Max.	1.16	0.94	0.56	1.49	0.88	0.73	0.75	0.83	0.84	1.23	1.69

Technology	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.30	0.47	0.23	0.41	0.31	0.23	0.26	0.18	0.18	0.20	0.27
Meadian	0.05	0.06	0.07	0.10	0.10	0.14	0.15	0.13	0.15	0.09	0.17
St. Dev	0.44	0.79	0.28	0.68	0.46	0.28	0.32	0.20	0.18	0.23	0.27
Min.	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Max.	1.46	2.43	0.89	2.53	1.90	1.14	1.44	0.87	0.74	1.02	0.87

Telecommunication	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.47	0.42	0.54	0.51	0.58	0.50	0.51	0.40	0.35	0.62	0.93
Meadian	0.41	0.27	0.20	0.45	0.69	0.37	0.50	0.53	0.51	0.64	0.81
St. Dev	0.13	0.26	0.89	0.37	0.24	0.22	0.38	0.34	0.29	0.28	0.33
Min.	0.36	0.24	0.16	0.21	0.23	0.37	0.06	0.03	0.01	0.14	0.72
Max.	0.63	0.76	2.55	1.30	0.80	0.96	1.29	0.98	0.76	1.08	1.61

Utilities	Debt to Common Equity										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.53	0.50	0.34	0.43	0.36	0.29	0.59	0.46	0.37	0.76	0.84
Meadian	0.53	0.50	0.34	0.43	0.36	0.29	0.59	0.46	0.37	0.76	0.84
St. Dev	0.17	0.13	0.39	0.06	0.20	0.35	0.26	0.59	0.43	0.53	0.88
Min.	0.41	0.41	0.07	0.38	0.22	0.05	0.41	0.04	0.07	0.38	0.22
Max.	0.65	0.60	0.62	0.48	0.50	0.54	0.78	0.88	0.67	1.14	1.47

Table 9. Descriptive Statistics for Debt to Total Capital Ratio by Industries

Basic Material	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.37	0.37	0.33	0.31	0.30	0.39	0.40	0.38	0.32	0.31	0.35
Meadian	0.34	0.30	0.36	0.28	0.24	0.34	0.37	0.32	0.29	0.27	0.32
St. Dev	0.16	0.18	0.13	0.15	0.17	0.16	0.17	0.20	0.16	0.18	0.20
Min.	0.05	0.05	0.10	0.10	0.07	0.18	0.10	0.08	0.08	0.05	0.00
Max.	0.67	0.63	0.59	0.59	0.56	0.63	0.80	0.99	0.55	0.65	0.81

Consumer Goods	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.39	0.38	0.39	0.39	0.30	0.32	0.35	0.31	0.30	0.30	0.35
Meadian	0.34	0.39	0.41	0.31	0.26	0.29	0.23	0.27	0.30	0.28	0.38
St. Dev	0.29	0.27	0.26	0.31	0.23	0.23	0.22	0.22	0.20	0.22	0.20
Min.	0.01	0.01	0.02	0.03	0.01	0.00	0.02	0.04	0.02	0.01	0.01
Max.	1.01	0.92	0.92	1.23	0.93	0.93	0.94	0.94	0.94	0.94	0.93

Consumer Service	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.27	0.23	0.23	0.26	0.29	0.40	0.44	0.38	0.31	0.33	0.33
Meadian	0.31	0.21	0.19	0.19	0.26	0.41	0.45	0.39	0.34	0.28	0.37
St. Dev	0.23	0.20	0.19	0.27	0.26	0.26	0.24	0.28	0.23	0.23	0.25
Min.	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Max.	0.63	0.64	0.67	0.88	0.89	0.90	0.87	0.97	0.89	0.88	0.88

Health Care	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.34	0.32	0.31	0.32	0.32	0.32	0.37	0.34	0.31	0.32	0.35
Meadian	0.35	0.28	0.29	0.24	0.27	0.27	0.37	0.37	0.29	0.29	0.34
St. Dev	0.28	0.31	0.21	0.22	0.25	0.25	0.22	0.23	0.21	0.23	0.25
Min.	0.01	0.00	0.03	0.00	0.03	0.00	0.04	0.01	0.00	0.00	0.01
Max.	0.75	1.17	0.70	0.67	0.86	0.73	0.72	0.71	0.71	0.75	0.90

Industrials	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.36	0.39	0.39	0.36	0.34	0.37	0.41	0.36	0.34	0.36	0.39
Meadian	0.38	0.37	0.39	0.32	0.30	0.31	0.43	0.37	0.36	0.38	0.37
St. Dev	0.23	0.24	0.25	0.23	0.22	0.23	0.30	0.24	0.25	0.22	0.19
Min.	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.02	0.02	0.01
Max.	0.91	0.91	0.97	0.93	0.93	0.93	1.91	0.90	0.97	0.89	0.89

Oil & Gas	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.14	0.16	0.22	0.29	0.26	0.53	0.34	0.29	0.24	0.36	0.30
Meadian	0.02	0.04	0.18	0.38	0.28	0.43	0.32	0.28	0.28	0.35	0.33
St. Dev	0.21	0.22	0.23	0.23	0.21	0.26	0.27	0.29	0.18	0.11	0.08
Min.	0.01	0.02	0.02	0.03	0.04	0.34	0.06	0.02	0.01	0.25	0.18
Max.	0.38	0.41	0.47	0.46	0.46	0.82	0.76	0.72	0.45	0.50	0.36

Technology	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.30	0.34	0.30	0.30	0.29	0.27	0.26	0.20	0.28	0.28	0.30
Meadian	0.26	0.37	0.25	0.26	0.23	0.21	0.16	0.14	0.23	0.24	0.24
St. Dev	0.22	0.26	0.24	0.25	0.22	0.23	0.25	0.20	0.25	0.25	0.24
Min.	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Max.	0.76	0.78	0.73	0.73	0.66	0.72	0.82	0.67	0.91	0.99	1.04

Telecommunication	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.31	0.18	0.19	0.40	0.24	0.30	0.32	0.20	0.24	0.22	0.40
Meadian	0.28	0.19	0.16	0.31	0.18	0.25	0.32	0.12	0.27	0.33	0.42
St. Dev	0.06	0.03	0.07	0.29	0.15	0.29	0.20	0.17	0.12	0.20	0.31
Min.	0.26	0.15	0.14	0.16	0.12	0.01	0.05	0.02	0.08	0.00	0.01
Max.	0.38	0.21	0.27	0.72	0.40	0.78	0.59	0.43	0.33	0.39	0.99

Utilities	Debt To Total Capital										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.68	0.63	0.65	0.50	0.53	0.57	0.55	0.56	0.50	0.56	0.60
Meadian	0.68	0.63	0.65	0.50	0.53	0.57	0.55	0.56	0.50	0.56	0.60
St. Dev	0.04	0.04	0.04	0.04	0.04	0.04	0.16	0.13	0.14	0.04	0.01
Min.	0.65	0.60	0.62	0.48	0.50	0.54	0.44	0.47	0.40	0.53	0.59
Max.	0.70	0.65	0.68	0.53	0.55	0.60	0.66	0.66	0.60	0.58	0.61

Table 10. Descriptive Statistics for Debt to Total Assets Ratio by Industries

Basic Material	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.26	0.26	0.22	0.18	0.20	0.27	0.28	0.27	0.23	0.22	0.26
Meadian	0.23	0.21	0.24	0.18	0.18	0.25	0.28	0.22	0.19	0.18	0.19
St. Dev	0.14	0.15	0.11	0.08	0.12	0.12	0.13	0.16	0.14	0.16	0.18
Min.	0.02	0.01	0.03	0.05	0.04	0.09	0.05	0.04	0.04	0.02	0.00
Max.	0.53	0.52	0.39	0.33	0.42	0.50	0.56	0.72	0.53	0.61	0.77

Consumer Goods	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.27	0.27	0.27	0.26	0.21	0.23	0.24	0.22	0.21	0.21	0.24
Meadian	0.26	0.28	0.26	0.20	0.15	0.17	0.18	0.17	0.19	0.17	0.25
St. Dev	0.21	0.21	0.21	0.19	0.16	0.16	0.15	0.15	0.14	0.16	0.14
Min.	0.00	0.01	0.01	0.02	0.01	0.00	0.02	0.02	0.02	0.01	0.01
Max.	0.69	0.66	0.73	0.76	0.57	0.57	0.62	0.63	0.59	0.67	0.57

Consumer Service	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.16	0.13	0.15	0.18	0.19	0.26	0.28	0.25	0.20	0.21	0.20
Meadian	0.18	0.09	0.14	0.10	0.10	0.28	0.29	0.25	0.20	0.19	0.20
St. Dev	0.14	0.12	0.13	0.20	0.18	0.18	0.17	0.16	0.14	0.15	0.16
Min.	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Max.	0.39	0.35	0.45	0.66	0.54	0.50	0.56	0.53	0.49	0.47	0.60

Health Care	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.25	0.23	0.22	0.25	0.24	0.24	0.28	0.27	0.24	0.25	0.28
Meadian	0.27	0.22	0.24	0.19	0.18	0.17	0.25	0.24	0.21	0.20	0.27
St. Dev	0.22	0.23	0.15	0.19	0.21	0.20	0.18	0.19	0.18	0.18	0.23
Min.	0.00	0.00	0.03	0.00	0.02	0.00	0.03	0.01	0.00	0.00	0.01
Max.	0.66	0.82	0.59	0.68	0.78	0.64	0.69	0.69	0.68	0.67	1.00

Industrials	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.23	0.25	0.24	0.23	0.23	0.25	0.28	0.25	0.24	0.25	0.27
Meadian	0.25	0.25	0.23	0.19	0.18	0.21	0.26	0.27	0.24	0.23	0.25
St. Dev	0.16	0.15	0.17	0.16	0.16	0.18	0.20	0.18	0.18	0.17	0.15
Min.	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.01	0.00
Max.	0.69	0.68	0.75	0.77	0.70	0.68	1.01	0.74	0.67	0.68	0.65

Oil & Gas	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.09	0.10	0.15	0.20	0.18	0.37	0.24	0.20	0.16	0.22	0.18
Meadian	0.02	0.03	0.13	0.26	0.19	0.28	0.19	0.18	0.18	0.22	0.19
St. Dev	0.15	0.13	0.14	0.15	0.14	0.22	0.19	0.20	0.12	0.05	0.06
Min.	0.00	0.02	0.02	0.02	0.03	0.20	0.05	0.02	0.01	0.15	0.10
Max.	0.26	0.25	0.30	0.31	0.30	0.61	0.56	0.51	0.32	0.27	0.23

Technology	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.21	0.25	0.21	0.22	0.21	0.20	0.20	0.15	0.21	0.22	0.23
Meadian	0.19	0.28	0.18	0.19	0.17	0.17	0.12	0.09	0.16	0.16	0.18
St. Dev	0.17	0.19	0.18	0.19	0.17	0.18	0.20	0.16	0.20	0.21	0.20
Min.	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Max.	0.71	0.74	0.72	0.67	0.54	0.64	0.68	0.62	0.78	0.88	0.90

Telecommunication	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.19	0.13	0.12	0.24	0.17	0.21	0.21	0.14	0.12	0.15	0.31
Meadian	0.23	0.16	0.12	0.25	0.15	0.21	0.25	0.09	0.09	0.11	0.28
St. Dev	0.07	0.07	0.01	0.10	0.15	0.22	0.10	0.12	0.10	0.16	0.27
Min.	0.11	0.05	0.11	0.14	0.03	0.01	0.04	0.02	0.03	0.00	0.00
Max.	0.23	0.17	0.14	0.34	0.32	0.58	0.28	0.28	0.26	0.32	0.84

Utilities	Debt to Total Assets										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	0.65	0.60	0.62	0.48	0.50	0.54	0.49	0.54	0.48	0.52	0.54
Meadian	0.65	0.60	0.62	0.48	0.50	0.54	0.49	0.54	0.48	0.52	0.54
St. Dev	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.12	0.12	0.03	0.00
Min.	0.65	0.60	0.62	0.48	0.50	0.54	0.36	0.45	0.39	0.50	0.54
Max.	0.65	0.60	0.62	0.48	0.50	0.54	0.62	0.62	0.57	0.55	0.54