Capital Structure Pattern and Macroeconomics Conditions
A Study on the Nordic Banking Sector 2003-2008

Author:  Júlia Vidal Bellinetti

Supervisor:  Catherine Lions
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Júlia Vidal Bellinetti
To my parents
Abstract
This study investigates the capital structure pattern on the Nordic Banking sector, and analyzes if the macroeconomics conditions have an impact on it. The topic is timely and relevant as the credit crises, which has reached the real economy strongly, appears to lead to a restructure of the capital structure of the firms. To achieve my objective I have observed the debt-to-equity ratio in the period 2003-2008. I conducted correlation analysis and further regression analysis to search for a relationship between the variables and then a cause-effect relation between the macroeconomic measures and the capital structure. In order to understand and select the macroeconomics measures to this investigation I have reviewed well known theories and studies about the subject.

I have found a stable debt-to-equity ratio on the book value; however to the market value the figures indicate a decrease in equity value, especially in the last year. In order to search for a macroeconomic relationship, I have developed hypotheses and examined them to select the most suitable variables to a regression analysis. The choice was the change in the GDP, the interest rate and tax rate.

The results revealed that the book value is better explained by these measures than the market value. They demonstrate statistical significantly, highlighting the change in GDP. Even if the findings suggest that there is a correlation between the macroeconomic condition and the capital structure, the analyses suggest only moderate relationship, that should be further investigate.

Key words: Capital Structure Pattern, Macroeconomic Conditions, Banking sector and Nordic region.
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Glossary

**Accounting Standards** Set of rules and conventions for the calculation of accounting numbers.

**Accounts payable** Amounts due for goods or services purchased on credit.

**Agency costs** Costs which prevent the agents acting on their own interest in detriment of the shareholders interests.

**Agent** Individual that acts in the name of another under this person’s authorization.

**Arbitrage** Make profits by the simple price difference of a security in two or more markets.

**Asset** Any property that can be traded as a security, e.g. share, bond, option.

**Asymmetric Information** When one party in a negotiation does not have the same information for the decision making than the other.

**Balance Sheet** A report that shows the financial situation of a firm on a specific date. Has a summary of assets, liabilities and net worth.

**Bankruptcy** When a company cannot pay its debts, a state of insolvency.

**Book Value** The value on the balance sheet.

**Business Risk** The risk associated with the operations of a business.

**Capital Expenditure** The capital used to purchase or expand the assets.

**Capital Structure** The proportion of a firm capital which is the long-term debt, preferred stocks and net worth.

**Commercial Bank** A bank which the main activities are taking deposits, making loans, checking facilities and securities advisory services.

**Convertible Bond** A bond that gives the holder the right to exchange the bond into preferred shares.

**Correlation Coefficient** A measure that indicates the relationship between two variables.
Cost of Capital  The rate of return of a firm in case it decides to take another investment with the same risk.

Current Assets  Cash or assets that can be turned quickly into cash.

Current Liabilities  The owed amount of a firm to be paid during the next year.

Debt  Obligation that must be repaid.

Debt-to-Equity ratio  The ratio of the long-term debt to shareholder’s funds of a firm.

Default  The failure to make payments.

Deflation  Decrease on the general prices.

Derivative  A financial asset that has its value based on the behavior of another asset.

EBIT  Earnings before interest and taxes.

Equity  An ownership share of a firm, also the risk capital of the business.

Expected return  The average return, calculated based on the probability of occurrence of the returns.

Fair value  Amount for which a good or service is traded, considering that both parts are reasonable informed about the transaction.

Financial distress  A situation when the obligations are not met.

Fixed cost  Costs that don’t vary according to the amount to goods and services sold.

Free Cash Flow  Earnings before depreciation, amortization and provisions, but after interest, tax capital expenditure and changes in working capital.

GAAP  Generally Accepted Accounting Principles.

GDP (nominal, real)  Gross Domestic Product. Is the sum of all goods and services produced by a country. Nominal indicates the inclusion of inflation and real the exclusion of it.

Inflation  The increase of general prices, consequently leaves to decrease of purchase power.
**Initial Public Offering (IPO)** Offering of a company shares for the first time.

**Leverage** The proportion of debt in the capital structure of a firm.

**Listed** Companies that have their shares traded on the exchange stock market.

**Liquidity** The degree that an asset can be converted in cash.

**Macroeconomics** The studies of the broad economic relations, as the national income, investments, balances of payment, interest rates, etc.

**Market Value** The value determined dynamically by buyers and sellers in an open market.

**Microeconomics** The studies of the allocating of scarce resources on a number of possible purposes. The logical consequences of this problem lead to study the economic behavior of individual consumers and firms, as well as the production and distribution of income between them.

**Monetary policy** The intentional control of money supply and interest rates.

**Net profit** Earnings after interest and tax.

**Option** A contract that gives the owner the right, but not an obligation to buy/sell a security.

**Return on Equity (ROE)** Shareholder profit based on the equity fund.

**Risk-free rate of return** The return of a riskless investment.

**R-Squared, \( R^2 \)** Coefficient of determination.

**Security** Financial Asset.

**Share** Title which confers the right to part of the ownership of a firm.

**Systemic Risk** Part of the risk that is equal to all securities on the same class, it cannot be eliminated by diversification.

**Tax shield** The benefit of having debt in the capital structure of a firm, it is the result of the non tribulation of the paid interesting.

**Taxable profits** Taxable profits are determined as the profit or loss in a period, which is established according to the rules by the pertinent taxing authorities.

**Variable Costs** Costs that modify with the changes of the goods or services sold.

**Volatility** The price movements, speed and magnitude, over time.
**Working Capital** Amount necessary to keep the operations of a business, calculated as Current Assets minus Current Liabilities.
1. Introduction

1.1 Background
The current financial crisis is the main topic of economic discussions nowadays. This credit crisis has led to problems of solvency, especially in the United States and in Europe, but all around it can be seen problems in liquidity due to the tightness of credit. Governments have been working in measures to try to overcome this crisis that has already reached the real economy stronger than anyone could imagine.

The negative scenario reached the companies, with a decreasing in consuming, dropping in the sales and the reducing of cash flows. With so many provisions and losses, the capital structure of firms becomes more fragile. To strengthen their own funds and the need of new finance, some firms were forced to rely on the funding of government. Others had to run to strong increases in capital, and also used the issuance of bonds to restore an acceptable financial structure. In an effort to re-establish the effective demand, a strong use of public spending is being made. The goal of these “packages” is to restore the level of economic activity by increasing investment in infrastructure. This should bring liquidity to the companies and allow them to keep their operations. All these measures emphasize the participation of the State in the economy.

As a consequence of this new picture a change in the capital structure of private firms can arise. How the firms will source their capital and how much of public participation will be on it is unknown. The topic is for sure timely and relevant.

The theoretical analysis of the capital structure focuses on the factors relate to the firm, as they are the main points that define a capital structure pattern. However, the macroeconomic factors can not be disassociated of the microeconomic factors, especially in a changing world. As the macroeconomic scenario modifies, the capital structure can directly or indirectly be affected and its pattern can change as a response to this.

The literature indicates the follow relation between the firm and the macroeconomic/institutional scenario:

1. Taxes. The tax rates have a major role in the definition of a firm capital structure, since it defines the cost of the each source of financing. The change in taxes on interest and dividends, the actual rate of saving as well as the subsidies directly affect how the company chooses for its capital

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structure.

2. **Stability.** Inflation can influence the loans because it modifies the cost of the funds. Also a higher inflation can discourage the issue of shares, so the monetary stability leads to more issuing.

3. **Development of the financial system.** The level of the development of the financial system of the country as well the model of its system creates an own model of firm’s capital structure.

4. **Volatility of the profits.** A volatile profit firm has a lower optimal debt-to-equity ratio, since it affects its capability of being burdened with debt.

5. **Profitability of the firm.** As it will be further present, the pecking order theory says that firms prefer to finance themselves first by retained earnings and just after with external capital. So, the higher the profitability, the higher is the possibility that the firm has to finance though the retained earnings. The profitability can be largely affected by the how the economy is doing, in recession periods the profitability of the firms, in general, has the tendency to decrease.

6. **The size of the firm.** The size of the firm affect the bankruptcy cost, they are proportionally higher in small firms. At the same time, the long-term debt and issuing of equity have higher costs for small firms too. So, it is reasonable to affirm that smaller firms have their capital structure more concentrated in the short-term debt.

7. **Industry sector and the specificity of the product.** Some industries have a very specific product, having a particular market to operate on it. This leaves to a lower debt-to-equity ratio. The specificity of a product makes it more susceptible to the market demand, which is affected by the economic conditions and growth.

So, regardless the importance of the economy’s business cycle and it relation with the inside the firm factors, little consideration has been paid to this. The economic intuition leads to believe that macroeconomic conditions affect the default risk and consequently the capital structure decisions.

Banks, unlike to all other businesses, have a unique role in the liquidity of the market, given their ability to borrow money from the current or deposit accounts. Because of this, the capital structure decisions have to consider that the costumers, in a stress
scenario, may run to banks to withdrawn their accounts, what can ruin the bank. So, there should be a balance between the use of debt, in attempting to create liquidity, and the equity, which guarantees more stability in a stress panorama. Thus there is a cyclical component in the composition of the capital structure of banks, theoretically in periods of economic expansion there should be less use of external capital and, in times of recession greater use.

1.2 Research Question
Is the capital structure pattern of the Nordic Banking sector adjusted with the macroeconomic conditions of the region or countries?

1.3 Objectives of the Study
The objective of this study is to discover the pattern of the capital structure of the banking industry in the Nordic Countries (Denmark, Finland, Norway and Sweden). At the same time, observe how it has evolved during the recent years. Moreover the goal of this study is to search for a relation between the components of the capital structure and macroeconomic/financial measures such as the GDP, interest rate, tax rate, and inflation. This should give an indication if the macroeconomic scenario affects the level of financing of these banks.

1.4 Demarcations and Limitations of the Study
The study seeks to investigate the pattern of the capital structure in the Nordic banking sector, and later examine if there is a relationship between the level of the debt-to-equity ratio and the macroeconomics indicators. To do so I have taken 30 commercial banks from the Nordic region. The selection of the data had to exclude the not open capital banks due to the unavailable information, concentrating the study on listed banks of the region.

Another consideration is related to the period of the study, although the pattern has considered the years 2003 to 2008, the statistical analysis of economic conditions excluded the last year of the sample. It was a consequence of the different source of the collected data, what lead to a smaller group of banks for 2008. To avoid a bias on the regression analyses, since the debt-to-equity pattern has shown a significantly change, probably as a result of the turbulent market period, the year was excluded of the analysis. The change, especially on the market value, is tendentious and could compromise the real relationship between the capital structure and the macroeconomic conditions. This, however, should not have a negative impact on the observed pattern of the sector, as it will demonstrate how the economic conditions affected instantly the capital structure of firms.
2. Research Considerations

This chapter should allow the reader to understand the reasons for the selection of the topic and the methodology used. This should clarify the choices made during this study. Preconceptions will be present and will show how that guided the author’s decisions. The scientific approach, the selection of theories and some clarifications over accounting measures present in this paper will also be discussed in this chapter.

2.1 Choice of the Subject

This research will try to discover a pattern to the capital structure of a specific sector and look for a correlation with macroeconomic measures. The idea for the subject came when I was doing my studies as an exchange student here at the Umeå University. As a student from the economic faculty in the Universidade de São Paulo, Brazil, I have concentrated my academic knowledge in economics. When in Sweden, taking financial courses, I decided to try to match the two fields.

During my research time, I have read a lot about capital structure in the recent years. I found many studies testing theories and improving models. The topic appears in this way to be relevant and current. Not for nothing the original Modigliani and Miller text about capital structure is, probably, the most influential paper of corporate finance. Simultaneously, the world is dealing with a credit crisis what may indicate the need for restructuring the system. This could modify how companies finance themselves.

Regarding the selecting of the companies, I have decided for the Nordic banks. I had an interest to understand the Swedish banking sector and its neighbors, since I have been living here for almost a year and I would like to have a deeper knowledge. Together, with the advantage of being relatively small economies and that could show better features, since the size of the country could represent the level of the internationalization of its firms. It means that a large economy could correspond to firms globalized and the correlation between the macroeconomic scenario and the capital structure of each country could be lost. So the expectation is that adoption of the Nordic economies can indicate more clearly the relation.

2.2 Theoretical preconceptions

My theoretical knowledge comes from the courses I have taken in the finance master program in Umeå University, and basically microeconomics and macroeconomics from my home university. I have also work as intern of equity research in an investment bank in Brazil, which allowed me to have contact with a
lot of information from the financing of the firms. This has inspired me to better understand the functioning of the capital structures of companies.

Based on my background, the Keynesian theory and the corporate finance theories have influence my topic decision and approach, so the data selection and processing will be treated over this view. However I will make use of objective data in attend to overcome this preconceptions. To defeat any bias that my preconceptions may cause in the findings and conclusions of my study, I have decided to use statistical methods strongly supported by the scientific community. At the same time, to formulate my hypotheses I will use the developed theories and will try to conduct an impartial analysis of it, as all hypotheses will be based on arguments present and supported by the literature.

### 2.3 Scientific Approach

Bryman and Bell (2003)\(^2\) define the scientific method as a technique for collecting data, which is used for acquiring knowledge or information, as well to add or correct the contents previous studies. The research should in this way follow these needs and aims to select the most suitable method to this approach.

In order to answer the research question, I have taken a deductive approach. I will formulate hypotheses, collect data, analyzing it in a search for results and findings that can confirm or reject my hypotheses. This should make possible the reformulation of the hypotheses, if necessary, to led to the final conclusions. However, the first step of my study is to verify the pattern of the firm’s capital structure. For this step, there is no necessity to formulate hypothesis.\(^3\)

Under the epistemological considerations, relative with the nature and limitations of the knowledge, a positivism approach will be taken. This attends to be objective, since this philosophy accepts the results that can only be proved. In this study, I will use the natural science methods to generate answers to my research question through hypothesis tests.\(^4\)

For the ontological considerations, which concern the identification of the things that really exist, this study will assume an objectivism position. The research question will be responded independent from the social actors. That is, by all means, I will try to be autonomous of my personal preconceptions.\(^5\)

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\(^3\)Ibid.
\(^4\)Ibid.
\(^5\)Ibid.
2.4 Data Collection

The selection of the data is strongly influenced by the type of study that the researcher has taken, either quantitative or qualitative.

The quantitative study is predominantly based on data collection technique and/or data procedure that have as a result a numerical data. It fits usually a deductive research strategy and objective view, in particular influenced by positivism.\(^6\)

In contrast, the qualitative study is based on data collection technique and/or data procedure that give as result a non-numerical data. For the research strategy there is typically an inductivity, constructivist and interpretive approach.\(^7\)

I have decided to take a quantitative study since the goal is to recognize a pattern of the capital structure and search for a relation among debt-to-equity ratio and macroeconomics conditions. I will make use of numerical data as a primary source. Another point that came when choosing the type of study was my positivism view, making more suitable the quantitative study.

2.5 Choice of Theories

The capital structure of a firm is explained by the macroeconomic factors and the factors related to the firm, the selection of theoretical review is performed to study these last factors. It also will introduce the reader to studies that investigate the capital structure pattern and the macroeconomic factors.

The literature starts from the well known Modigliani and Miller approach, passing through the pecking order and trade off frameworks and finally the market timing. I have read and researched at least three authors of each model before trying to show to the readers the main points behind these approaches.

2.6 Collection and Critical Review of the Literature

Fortunately, the capital structure is a well developed topic on the corporate finance literature. The main approaches of the literature concentrate on the internal aspects of the firms that explain the level of the debt-to-equity ratio. The macroeconomic factors are a more recently view, but is now starting to be discussed. To be sure of the relevance of the subject of my thesis I have research the development of the capital structure study. I collect the number of scientific articles published in the last decades. This is what I have found:

\(^6\)Bryman and Bell, 2003, Pp. 573.

\(^7\)Ibid.
Table 1: Scientific Articles on Capital Structure

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of scientific articles</th>
<th>Annual Average</th>
</tr>
</thead>
<tbody>
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<td>131</td>
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</tr>
<tr>
<td>70s</td>
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<td>41.7</td>
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<tr>
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<td>3926</td>
<td>392.6</td>
</tr>
<tr>
<td>in 2008</td>
<td>498</td>
<td>498</td>
</tr>
</tbody>
</table>

Source: Proquest

The table show clearly that the topic is every year been more discussed, showing the importance of it.

Given the number of study, books and articles wrote on the topic, I try to concentrate the collection of the secondary sources on the scientific articles. I reason was that I could found more update data, a more critical approach and, for many cases, the original source of the theories. I used a few book, most of them used from the literature of the courses I have took. Since my mother language is not English, I had the opportunity to search for texts also in Portuguese. What gave a wider range of articles to work with.

To make sure that my sources are reliable and relevant to my investigation I search the numbers of previous citations that the text I used had. As expected the article from Modigliani and Miller (1958) had 4,833 citations, showing a spectacular importance for the topic. Also the other texts from these authors were widely cited, around 1,400 citations. All of the texts present a level of significance to the topic. The sources related to the macroeconomics conditions related with the capital structure were more recently and had a shorter coverage; however it was still really relevant. I can highlight the Singh study\(^8\) with 147 citations, the article of Hackbarth, Miao and Morellec\(^9\) with 59 citations and Zonenschain article\(^10\) with 26 citations. It proves that the literature is reliable and well discussed, making the theory review of my study valid and appropriate to the analysis.

2.7 Methodology

The analyses of the capital structure of a firm can be made from two sources: from aggregate data of financial system institutions, including stock markets, banks, etc.


The other way is pulling the information directly from the balance sheet of the companies. Both ways have advantages and disadvantages. The first is comprehensive but it can lead to greater inconsistency of data, given the different sources. The second solve the problem of inconsistency but leads to a more limited coverage. In this study, I choose to extract information from a provider that aggregates Bloomberg and Capital IQ data. The choice was made because these agencies collect the market data and the accounting data. As a consequence, I have empirical material from both views. The standardized balance sheet format gives a better comparison view and makes the analysis of different firms more similar. Also it has the rationality of the accounting rules, the reasonableness of these rules make the approach more objective. And the market value, which represents the value that a transaction can take. In the next section, further analyses will present the different and advantages of both approaches.

2.7.1 Market Value versus Book Value
The theoretical framework regarding capital structure considers the market value of the firm. However, in the real life firms, mainly, uses the book value to make decisions regarding their financing.

The book value is the value of the firm’s resources in the balance sheet. It is the equity, calculated as the Total Assets minus the Liabilities. It is the value for reference, since the data can have a delay from the correct market value; due to the timing it is reported. The market value, on the other hand, can be a subjective value, as it depends of the judgment of the buyers and seller of the shares, the ones that make the market working and give its liquidity. It should be highlighted that the book value considers the economic value, not the financial value. This means that the value on the balance sheet doesn’t reflect the effective value, which is given by the market.

Although the book value has a more standardized approach and rationality behind still there is a conceptual problem when working with it. According to the accounting rules the treatment of the financial statements are different, what can produce an accounting bias in the analyses. Mainly, the firms use the U.S. GAAP (Generally Accepted Accounting Principles) or the IFRS (International Financial Reporting Standards). The conceptual difference is that the U.S. GAAP is based on the historical value (at the cost value) and the IFRS in the fair value. This can lead to significantly difference in the calculation of the leverage, in special of the banks. The derivatives have diverse treatment under this two accounting principles. IFRS considers under the gross exposures, and the U.S. GAAP under the net value. This impacts the value for the Total Assets. So, IFRS tends to have higher leverage. The treatment of convertible debt is also distinct, under U.S.
GAAP report it is classified as liability, however for the IFRS reporting it is classified as debt and equity, and assigned at fair value as liability and residual amount as equity.\textsuperscript{11}

The accounting principles were developed independently in the Nordic countries over the years. Nonetheless, as the standard principles start to converge in the world, the Nordic region is following this tendency. Therefore, recently all for countries have adopted the IFRS accounting principles, but the data before 2005 still presents notable accounting differences.

A firm can finance itself maintaining it target debt-to-equity book ratio or target debt-to-equity market ratio, but not both. To understand the methodology used in this paper it is important to consider some reflections about these two concepts\textsuperscript{12}:

1. The balance sheet reflects the historic cost of the assets; normally these values don't represent the real value of the asset and its ability to generate cash flow. In these aspects, the market value is a better measure, because, as said before, it shows the expectations and the capacity of the firm of generating cash flow. This is true, considering the U.S. GAAP; however IFRS tries to overcome this problem by the adoption of the fair value, although it is not a perfect solution.

2. The maximization of the firm’s value is mainly represented by the maximization of share price. So the correct manner to analyze the value is the use of market values, since they determine the share price.

3. The firm’s executives prefer stability and certainty rather than volatility and uncertainty; this is the reason why they concentrate their efforts to accomplish a debt-to-equity ratio at a book value. These figures are more predictable, making it more possible to active to the exactly established value. The use of the market value is less suitable in practice, since the values change permanently and make very difficult, even impossible, to active and maintain it for a long period.

4. The debt-to-equity ratio at a book value can change over the years even if there is no growth or changes in the risk of the firm. A company that has activated it target debt-to-equity ratio at a book value but has to acquire new assets to overcome the old ones will finance it in a balanced combination to


maintain its target. Though, if there is inflation, and in most cases there is, the profits will increase even if the selling rate doesn’t increase, as consequence of the higher selling price. This will increase the ROE and, consequently will make the debt level higher, forcing the administration to review the debt target. In conclusion, the target debt-to-equity at a market value, probably wouldn’t change since it also reflect the inflation but the use of the book value made the level of debt of the firm increase.

5. As it appears in the last item, inflation or deflation have an important responsibility in the discrepancy between the book value and the market value. The increase/decrease of the general prices change the market value to reflect this modification. At the same time, the book value remains the same, since the assets are reported as the value at the purchase time, leaving a gap between the two values.

So what can we conclude from this reflections? The market value is a better measure for the analyses of the debt-to-equity ratio. At the same time it presents a disadvantage that can’t be ignore. The market value changes all the time and can represent number of distortions due to the expectations of the market. Considering this, the decision to take the aggregate data, the book value and market value available seems the right choice to make; avoiding data biases in the empirical analyses. It will show both approaches, leaving to a better conclusion of which one is more suitable to an analysis like this.
3. The Nordic Banking Sector

In this chapter there will be introducing the Nordic banking sector to the reader. This should create a foundation for the analyses that will be taken further on the study.

3.1 Overview of Nordic Banking Sector

The Nordic Banking Sector is characterized by the similarity between its members; the sector represents an important part of the region economy, even though the size varies a lot between the countries. Different from the world trend of internationalization of the banking industry, with mergers and acquisitions, the Nordic region faces an exception scenario. The largest Nordic banks define as their home market this region. The market is dominated by regional banks; this can be explained by the common history, cultural similarity and the integration facility. It can be seen also as a strategy against the “foreign” bank groups, as a protective measure; this could be explained by the strong cooperation between Nordic banks.

![Figure 1: Banking Sector lending/ deposits](image)

The economic situation in these countries is stability, all face low inflation and low interest rates, consequently rising equity price and the lending growth is increasing significantly (see figure 1). This positive panorama has contribute to the well development of the sector, this can be recognized due to the fact that total assets of the industry has exceeded the GDP in all the Nordic countries Denmark has the relatively higher banking sector, followed by Sweden. Finland and Norway, although have a strong market are comparatively smaller to the size of their economy.
Table 2: Banking Sector total assets/ GDP

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
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<td>Denmark</td>
<td>2,6</td>
<td>2,9</td>
<td>3,0</td>
<td>3,2</td>
<td>3,3</td>
</tr>
<tr>
<td>Finland</td>
<td>1,1</td>
<td>1,1</td>
<td>1,2</td>
<td>1,3</td>
<td>1,4</td>
</tr>
<tr>
<td>Norway</td>
<td>1,3</td>
<td>1,4</td>
<td>1,5</td>
<td>1,4</td>
<td>1,5</td>
</tr>
<tr>
<td>Sweden</td>
<td>2,1</td>
<td>2,1</td>
<td>2,1</td>
<td>2,3</td>
<td>2,7</td>
</tr>
</tbody>
</table>

Source: Nordic Banking Structures-Report

Concentration is another highlight characteristic of the Nordic sector. Sweden has over 80% of the market in the hands of only five bank groups, as Finland have too. Norway is the least concentrate market with almost 50% on the five big bank groups. We can divide these banks into six categories: the commercial banks, foreign banks, savings banks, co-operative banks, mortgage banks and other credit institutions. With the commercial banks has the leading market share, this shares have chance only marginally over the recent years.

3.2 National banking Sector in detail

In Denmark, the largest groups are the Danske Bank (the sector leader in the country) and Nordea. Other medium sized banks play important part, as the Jyska Bank, SydBank. However, the Danish market can be accepted by its extensive numbers of small and regional banks. Also there is a strong presence of foreign banks, albeit 84% (in 2005) of this share is represented by Nordic banks, highlight for Nordea.

The largest Finnish banking institutions are: OP Bank Group, Nordea Bank Finland and savings banks (incl. Aktia). Insurance segment became important over the years since OP Bank group, via OKO bank merger with Pohjola. Norway has two main groups: DnB NOR and Nordea. Medium banks also represent a significantly part of the segment, SpareBank 1 SR-Bank can be highlighted.

Swedish bank industry, as described before, is highly concentrated by FöreningsSparbanke, Handelsbanken, Nordea and SEB. All the four banks have a strategy over the Nordic and Baltic region, and in this last area a market share of around 70%. SEB has also a large presence in Germany, with 30% total lending of the local market. The Danske bank is the fifth largest bank in the country. As we can realize, Nordea is the largest Nordic Bank, with strong presence in all markets, the strategy of the groups is to expand over this region, which represents 90% of the banks cash flow, and to the Baltics. The government owns around 20% of the bank.
Below you can find a summary of the operating profit of the largest Nordic groups:

### Table 3: Operating Profits of the Nordic financial groups, 2004-2005\(^{13}\)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Danske Bank Group</td>
<td>1 139</td>
<td>1 117</td>
<td>2%</td>
<td>2 387</td>
<td>1 749</td>
<td>36%</td>
<td>336 954</td>
</tr>
<tr>
<td>Nordea Group</td>
<td>1 790</td>
<td>1 572</td>
<td>14%</td>
<td>3 048</td>
<td>2 745</td>
<td>11%</td>
<td>325 450</td>
</tr>
<tr>
<td>SEB Group</td>
<td>812</td>
<td>608</td>
<td>34%</td>
<td>1 209</td>
<td>1 078</td>
<td>12%</td>
<td>325 450</td>
</tr>
<tr>
<td>Svenska Handelsbanken Group</td>
<td>979</td>
<td>758</td>
<td>29%</td>
<td>1 688</td>
<td>1 460</td>
<td>16%</td>
<td>185 419</td>
</tr>
<tr>
<td>FöreningsSparbanken Group</td>
<td>711</td>
<td>729</td>
<td>-2%</td>
<td>1 617</td>
<td>1 140</td>
<td>42%</td>
<td>137 969</td>
</tr>
<tr>
<td>Op Bank Group</td>
<td>389</td>
<td>293</td>
<td>33%</td>
<td>579</td>
<td>511</td>
<td>13%</td>
<td>57 828</td>
</tr>
<tr>
<td>Jyske Bank Group</td>
<td>152</td>
<td>149</td>
<td>2%</td>
<td>295</td>
<td>263</td>
<td>12%</td>
<td>20 270</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 972</strong></td>
<td><strong>5 226</strong></td>
<td><strong>14%</strong></td>
<td><strong>10 823</strong></td>
<td><strong>8 946</strong></td>
<td><strong>21%</strong></td>
<td><strong>1 278 929</strong></td>
</tr>
</tbody>
</table>

Source: Nordic Banking Structures-Report

3.3 A Banking Crisis in the Nordic Region: a Swedish example

Sweden has faced a banking crisis in 1992 that changed the deregulation in the country. Before the deregulation the main objective of the regulatory institutions was the stability of the system and the administration of its activities. Now the key goal is to ensure security for the system and safety for the depositors.

The deregulation stimulated the granting of credit, lending to economic warming that consequently resulted in a bubble of the asset prices, since the monetary and fiscal policy were expansionist. The housing market was the major market affected, similar to the crisis that began in recently in the housing market in the United States. When the bubble came apart, because of the increase in interest rates, mainly due to inflation pressure, the default spread over the banking sector leaving a loss of over 70 billions kroner.

Differently from the solutions that the North American government has been taking to try to overcome the current crisis, Sweden did not just take over the bad debt from the banks and released money. It forced the banks to write down their losses and issue warrants to the government. The idea was to transform the government as an owner, when the “bad” assets were sold the money could return to the taxpayers, the government also had an advantage of selling its participation and recovering the money invested. As Bo Lundgren, fiscal and financial minister at

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\(^{13}\)Here it is used financial groups, not banks, because the numbers include the insurance segment.
the time affirms “If I go into a bank, I’d rather get equity so that there is some upside for the taxpayer”.\textsuperscript{14}

At the same time, there was the creation of the Bank Support Authority, to regulate the system and control the recapitalization of the needed banks. The government had to spend, at the time, around, 4\% of the GDP; however the final cost only reached 2\% of the GDP. The recovered process was classified as “transparent” by the government in attend to reestablish the financial markets confidence. The minimization of costs for the taxpayer was considered very relevant and international agencies were hired to evaluate the solvency of the banks.

The actions took by the Swedish government at the time were fundamental to regulate the country’s banking sector. It was an example to be followed, given that the international confidence returned quickly, even having effected serious the economy and widespread mistrust and crisis for neighboring Scandinavian countries. In recent times, it was comment that North America government should consider these solutions to overcome the crisis, but it doesn’t show any signs it will take a similar approach, the reason is definitely unknown.

4. Theory Review

The capital structure can differ a lot from one company to another, especially from one sector to another, but also in between the same sector the firms can have a very distinct capital structure. There are a significant number of theories and studies that try to identify the optimal capital structure and the firm’s decision process of how much debt and equity to use. This chapter will introduce the reader to this theories and studies.

The capital structure of a firm is the reflection of the sources it uses to finance its projects. It means that to operate its projects a company can generate capital by itself or fetch externally through third parties, it can be by issuance of debt or the issuance of equity. Therefore, capital structure is composed by the long-term debt, preferred stocks and the net worth of the company. The capital structure is observed not only in terms of its composition but also in terms of the debt-to-equity ratio, the leverage.

Given the relevance of the theme for the study of economic dynamics, a vast literature has already been produced in this field of finance. The work of Modigliani and Miller (1958)\textsuperscript{15} is the starting point to any modern study about capital structure. These precursor authors proposed that the financing pattern of firms does not affect the level of investment and economic growth rate, and so the leverage would not affect the value of the company. Using an analogy “the value of a pie does not depend on how it is sliced”\textsuperscript{16}. These propositions have been largely discussed and debated; different assumptions have been taken, that have contributed to the increase of interest and knowledge in the theme.

The choice of the most suitable debt-to-equity ratio has to consider several aspects. However, basically, the debt has two advantages. The first is the decrease of the total cost of the borrowing due to the tax deductible that the paid interests have. The second is that the stakeholders don’t have to divide the profits with the debt holders, since they have a fixed return guarantee. At the same time, the use of debt brings some disadvantages to the companies. The risk of the firm increase as the debt-to-equity ratio becomes higher, this raise the total cost of borrowing and also the cost of the assets. If the company goes through a period of difficult and the profits drop significantly, the expenses including interest can not be matched. The stakeholders will be forced to cover these expenses and if they don’t


do it the firm has the risk of bankruptcy. So in theory, companies with earnings and cash flows less volatile should be the ones that can afford the higher use of debt. In contrast, the less stable earnings companies should limit the use of debt.

As concerning the empirical work many studies have focused on the determinants of capital structure. Wanzenried (2006)\textsuperscript{17}, for instance, investigates the effects of institutions and market characteristics on corporate capital structure dynamics. The paper focuses on U.K. and the continental Europe and argues that in more developed financial markets firms adjust their capital structure better towards the target. Recently, Antoniou et. al. (2008)\textsuperscript{18} through an empirical analysis in U.S., France Germany, U.K. and Japan concluded that the firm’s leverage is influenced by the tax systems, the corporate governance practices, and also by the corporate and banking relations of which country. So a study that compare how the capital structure is in some countries will probably show differences, as a result of the environment in which the firm operates.

I will first present the dominant theory concerning the internal factors of the firm that determine the capital structure, since they are the focus of most studies on the subject, and also can’t be disassociate of the macroeconomic scenario. After that, a summary about the studies concerning the capital structure and macroeconomic conditions will be discussed.

4.1 Modigliani-Miller Model

The starting point to the modern theory of capital structure is the Modigliani-Miller approach\textsuperscript{19}. For their work, the writers, Franco Modigliani and Merton Miller, received the Nobel Price. The pioneer model explains that the value of a company is not affected by the capital structure. This affirmation is based in a very restrict set of assumptions. Although it was a very simplified model of the world, it put the conditions that make the capital structure irrelevant and, at the same time, they also pointed the elements which determine the relevance of it. The MM assumptions are\textsuperscript{20}:

1. No brokerage costs;
2. No taxes;
3. No bankruptcy costs;
4. The investors can borrow at the same rate as the corporations;

\textsuperscript{19}Modigliani and Miller, 1958.
\textsuperscript{20}Brigham and Ehrhardt, 2006 , Pp. 638.
5. There is no asymmetric information between the investor and the administration about the future investment opportunities of the firm; and
6. EBIT is not affected by the use of debt.

4.1.1 The MM Model in a world with no taxes
The MM model analyzes the debt-to-equity ratio based on two propositions.

Proposition I:
“(…) the market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate \( \rho_k \), appropriate to its class of risk.”\(^{21}\)

(italics added)

Using the same notation of the authors:

Denote by \( V_i \) the market value of the firm, by \( S_i \) the market value of common stocks, by \( D_i \) the market value of the debts, by \( X_i \) the expected profits before deduction of interest, by the \( \rho_k \) the required rate of return for a no leveraged firm.

\[
V_i = (S_i + D_i) = X_i / \rho_k \text{ for any firm } j \text{ in class } k \tag{1.1}
\]

\[
X_i / (S_i + D_i) = X_i / V_i = \rho_k \text{ for any firm } j \text{ in class } k \tag{1.2}
\]

\[
V_i = X_i / \rho_k \tag{1.3}
\]

For any class it means the same class of business risk.

In other terms, the use of capital of third parties is completely irrelevant to the determination of the firm’s value. The reason behind is that the different financing combinations don’t change the total cost of capital of the firm. The equation (1.3) gives the present value of the expected cash flow for a firm with no growth. The assumption of zero growth it is just a simplification and don’t affect the results.\(^{22}\)

Copeland and Weston(1988)\(^{23}\) demonstrated the MM proposition I, from that and the assumptions early made, they affirm that any investor can reply the gearing of a firm, since the personal borrowing and the corporation borrowing have the same

\(^{21}\)Modigliani and Miller, 1958, Pp.268.
cost. Also the investor can do that by acquiring a debt security. In both cases, the investors can do arbitrages; a non levered company has a different value from a levered one, only if the two have the same expected cash flow. If the market works perfect, the values will converge to equality and this will make irrelevant the participation of third parties capital. That also explains the constant and equal expected rate of return.

Proposition II:

“(…) the expected yield of a share of stock is equal to the appropriate capitalization rate $\rho_k$ for a pure equity stream in the class, plus a premium related to financial risk equal to the debt-to-equity ratio times the spread between $\rho_k$ and $r.$” 24 (italics added)

Denote by $i_j$ the expected rate of return, by $\rho_k$ the cost of equity for an all equity firm, by $r$ the required rate of return of borrowing.

$$i_j = \rho_k + (\rho_k - r) \frac{D_j}{S_j} \quad \quad \text{(1.4)}$$

We can observe from equation (1.4) that the $i_j$ grows linearly with the increase of $D_j/S_j$. But what does that means? To any increase of $D$, higher level of gearing, the risk for the shareholders will also increase. If the risk is going up, the $r$ will take the same direction. So when $D$ increases the WACC should go down but it will be counterbalanced by the increase in the risk. So these two movements make a null effect on the average cost of capital.

**Figure 2: WACC and cost of capital in a world with no taxes**

Source: Adapted from Copeland and Weston (1988)

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24 Modigliani and Miller, 1958, Pp. 271.
4.1.2 The MM Model in a tax world

The original model of MM had pretty unrealistic assumptions; to improve their view of the world and correct some illusory conclusions they publish a second work. This time including the income tax of legal entities.

The authors correct their statement that “the market values of firms in each class must be proportional in equilibrium to their expected returns net of taxes (that is, to the sum of the interest paid and expected net stockholders income).” The reason is that interest are tax deductible and consequently, in a firm with debt most of the profits goes to the investor, increasing the value of the company, since the average cost of capital will decrease.

\[ i_s = p + (1 - \tau_e)(p - id) \frac{D}{S} \]  \hspace{1cm} (1.5)

The \( \tau_e \) represents the cost of equity. From the equation we can realize that \( i_s \) will decrease as the D/S ratio goes down, up to the limit of \( p + \tau_e (id - p) \) when D tends to \( \infty \). In other words, it is better to the firm to get as much debt as possible until the limit that all the structure is composed by debt. Indeed, even with the introduction of this type of taxes the model still contains some equivocal results, such as the use of risk-free rate for assessing the value of firms.

4.1.3 The Miller Model

The expanded model of MM that included the income taxes of corporations was a better version of the first assumptions, yet it still ignores an important factor, the personal income taxes. Miller proposes a new model in his 1977 paper, where the (1.4) equation becomes:

\[ VL = Vu + \left[ 1 - \frac{(1 - \tau_e)(1 - \tau_{Ps})}{(1 - \tau_{Pd})} \right] D \]  \hspace{1cm} (1.6)

Where VL is the leverage firm, Vu is the unleveraged firm, \( \tau_{Ps} \) is the tax aliquot on personal income of shareholders and \( \tau_{Pd} \) is the tax aliquot on personal income of the creditors of the company.

The conclusions we can draw from the new equation are ambiguous. The terms in the brackets represent the gain from the debt. If there are no taxes at all we have

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26 Ibid.
the same model as the original MM. The same result is given when 
\[(1 - \tau e)(1 - \tau p) = (1 - \tau d),\] 
since the brackets value is null. If only the personal 
income taxes are ignored the model just comes back to the MM with taxes. If both 
taxes aliquots are the same it looks exactly like the MM with taxes again. But when 
the taxes on equity gains are lower than debt taxes the gain from debt is lower than it 
was predicted in the MM with taxes.

The major aspect to be aware of, in the Miller work, is that according to this the 
original MM with no taxes was correct.

### 4.1.4 Critiques to the MM and the Miller Models

The MM model and the later Miller model were important and still today are guides 
to any finance analyses; however it is a consensus between the analysts that they 
are far away from accuracy. The main objections are29:

1. **The gearing investors and corporations are not perfect substitutes.** The 
   assumption made by the models fails given that a high personal risk curbs 
   this investor. Also, the current impositions delay the arbitration process, 
   since many investors can not legally take loans to buy stocks, prohibited 
   from doing home gearing.

2. **The costs of brokerage are ignored.** This and other transactions costs are 
   important and could impede the arbitration process.

3. **Both firms and investors can not really take loans at the risk-free rate.** Even 
   after the introducing of debt with risk, both firms and investors are consider 
   to have the same cost for a loan. That is unreal since investors typically 
   have higher costs that the corporations.

4. **The tax shield is not the same for all companies.** Miller model considers that 
   the equilibrium will be achieved when the debt shields is the same for all 
   companies. However, truly, the benefits vary from firm to firm, giving the 
   most profitable ones a better advantage.

5. **The authors ignore the agency costs, the costs of financial distress and the 
   asymmetric information.** These topics will be present further on.

### 4.2 The Optimal Capital Structure

The optimal capital structure of a firm is the one that represents the equilibrium 
between the risk and return, which leads to the maximization of the value of the

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29Brigham and Ehrhardt, 2006, Pp. 672-673.
company. The optimal level modifies over the time as the economic and financial conditions change. Important authors, such as Angelo and Masulis (1980)\textsuperscript{30}, propose this approach in contrast with MM model. Since firms have different costs for their financing, there should be an optimal capital structure that minimizes the average costs of capital.

To establish this level, a firm should consider many factors and work to maintain it leverage as close as possible from the target. The major factors to be considered are\textsuperscript{31}:

1. \textit{The Business Risk}. The risk related to the operations of the firm, the riskier the business of the firm the lower the tendency of the firm to have more debt. The business risk varies especially between firms of different sectors, but also in the same sector there is a very diverse business risk involved in each company. The reason behind the difference is the variability of the demand; firms with more stable demand have lower risk. The selling price also influence significantly. The high proportion between fixed costs and variable costs gives the firm a high business risk, as the firms is plaster with the costs.

2. \textit{The company tax position}. The use of debt is stimulated for the tax shield that it gives. If a company already has a great tax benefit a higher level of debt will not increase it and would not bring more advantage to the firm.

3. \textit{Financial Flexibility}. This is related to the ability of the firm obtaining capital when necessary. If the financial situation of a firm is stable, the chance of incurring in a serious sort of capital is lower, and consequently the level of debt can be higher.

4. \textit{The administrator vision}. The administration is the one responsible to determine the target capital structure, so the aggressiveness or conservatism of the administrator can have an effect on the level pursued by the firm.

5. \textit{Growing Opportunities}. A company with a large range of growing opportunities needs a more flexible capital structure; because of the higher probability that new projects that demand capital arises.

The balance between these factors and other determinants of the optimal capital


\textsuperscript{31}Brigham and Ehrhardt, 2006, Pp.616-617, 619
structure is developed further by the Trade Off theory.

4.3 The “Static” Trade Off Theory
The literature on the financing pattern of companies is defined by three theories: trade-off theory, pecking order theory and market timing theory.

The Trade Off theory says that the firm capital structure is set by contrast cost and benefits from debt and equity. So the firm should place a target debt-to-equity ratio and move to it gradually. In the next sections I will look closer to each element that makes this trade off.

4.3.1 The Benefits of Tax-Savings Mechanism
The use of debt can become an attractive way of financing the firm since the debt is tax deductible. In this way, the debt can have a lower cost than equity. At the same time, if fewer taxes are paid, the free EBIT increase, making the value of the company higher. This point was already highlighted in the MM model\(^\text{32}\).

4.3.2 The Cost of Financial Distress
The tax shield provided by the debt is counterbalanced by the risk of the financial distress. The greater use of debt and the larger the fixed costs of interest, the greater is the likelihood of a fall in profits leading to a default. Thus higher probability of occurrence of costs associated with it\(^\text{33}\).

The bankruptcy can lead to legal and administrative costs, as many agency expenses and moral-hazard. The direct costs of bankruptcy include the cost with the problems between the claimants, which delay the liquidation of the assets causing the obsolete stocks, as the deterioration of equipment and facilities. It also includes the attorney’s fees and the expenses of the legal process. Others costs, the indirect costs, come when, for instance, the firm is in trouble and the administration act in the short run to avoid layoffs, decreasing even more the value of the company. This includes also actions of the clients and suppliers, who take “evasive measures” afraid to come out with disadvantages if the business fails.

4.3.3 Agency Costs
The concept of agency costs is related to the price that the firm pays because of the asymmetric information and the interest conflicts between the management (the agent), the shareholders of a company and the holders of its debt securities. If the management can take decisions without any restrictions, it can work to

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\(^{32}\)Brigham and Ehrhardt, 2006, pp. 672.

\(^{33}\)Ibid pp.674.
increase the personal power of the managers in detriment of the best interest of the shareholders and bondholders.\textsuperscript{34}

To avoid this type of behavior the managers can be monitor very close, this should curb them. However, putting in practice this can also incur in an increase of costs. An alternative measure is to link the managers to the interest of the ownership. Paying managers with shares and share options can decrease the costs but is far from being a perfect solution.

4.3.4 The cost of adjustment
Myers(1984)\textsuperscript{35} talks about another cost that firms have to consider when setting their optimal debt-equity ratio, the adjustment cost. Firms can not immediately regulate their debt-equity ratio when some economic event comes and changes the scenario. In this way, even companies in their optimal ratio can incur in some extra cost. Myers highlights that this cost is rarely discussed in the Trade Off scope and, in fact, are a secondary concern when managers set their optimal debt-equity ratio. However, it could explain why firms are not at the optimal ratio, since they would have to work hard every time something unexpected happen and with no guarantee how long will stay like this.

4.3.5 Implications of the Trade Off Model
The Trade Off model doesn’t really determine the level of the debt to equity, it only give the aspects that managers would have to consider when making the decision. These elements make possible to say that firms with a higher business risk should use less debt than the ones with lower risk, this is true because the chance of having costs with financial distress is higher in the riskier companies. Besides this, companies with more tangible assets can afford more debt since in comparison with intangible assets they are less subject to depreciation in case of bankruptcy. And finally, the most taxed firms should use more debt than the firms with lower taxes, since the debt would give a greater benefit for them. The figure below shows a resume of the elements that make the trade off for the companies when deciding the debt-to-equity ratio.

\begin{flushright}
\textsuperscript{34}Brigham and Ehrhardt, 2006., Pp.675.
\end{flushright}
Graham and Harvey (2001) conducted a well known study that explores the capital structure decision over a group of almost 400 US CFOs. Their focus was the importance of the theoretical framework to the decision making. The conclusions show a “moderate” support to the Trade Off theory, due to evidences given by the survey that the administration considers the corporate interest deduction in the decision of more debt. The volatility of the cash flow is also considered. Yet, the survey doesn’t confirm the importance of bankruptcy to the decision making process of the capital structure.

Based on this survey, Brounen et. al. (2006) conducted a similar study to European firms. Their findings are in line with Graham and Harvey (2001), overall the firms search for a target debt-to-equity ratio. Evidence of the tax effects was present in the European scenario too, and it is more important than the financial distress aspect. According to the authors little evidence about agency costs could be found, beside the large literature about it.

Although, the model seems to make sense and have been largely discussed, the empirical evidence can’t support it entirely, as it seems that many aspects are not considered in the real decision process of the debt-to-equity level. If the model would be correct the capital structures of firms in the same sector should present themselves reasonably similar.

4.4 Pecking Order Theory

The trade off model began to be questioned when Gordon Donaldson led a study to identify how companies truly establish their capital structure\textsuperscript{38}. The results went against the trade off theory of a balanced treatment of cost and benefits, and also contradicted the MM assumptions of symmetric information. The highlight point of his conclusion was that firms prefer to finance themselves by internal funds, with retained profits. In addition, if the firm has enough cash flow to cover its expenses, it will use the rest to pay all debt and increase dividends. In the other hand, if there is not enough the firm will first use debt and just after look for issuing equity. So, there is a “pecking order” for financing.

4.4.1 Asymmetric Information and Signaling

The asymmetric information refers to the unequal information that different individuals have. This means normally that the administration knows more about the business than the external investors. The consequence of the asymmetric information is that the choice of the capital structure becomes a way to signaling to outside investors the opportunities, decreasing the discrepancy of information.

Suppose a firm has a new product that can easily be copied by the competitors, so the company will try to keep it in secret the longest time possible until all the researches can be conducted and the product can be released. However, it is necessary an extra capital to this. How the firm should conduct it? If the firm issues more equity before the release of the product when there is an extra profit it will increase the share value, and the benefit of this new product will be spread to all the new and old shareholders. The original shareholders will lose some profit here. The best alternative in this case is use debt over the optimal level to increase the benefit for the current shareholders.\textsuperscript{39}

In opposition, if the firm has predicted a decrease in the profits and needs money to try to achieve the same level of products as its competitors, a good solution is to issue equity to do so. By doing this the firm divides losses. A company in difficulty normally prefers to issues shares instead of debt. In conclusion we can realize that if a company issues shares it is a sign that it expects a difficult moment. However, another side needs to be considered. Even if the company expects a good scenario it may desire to issue shares to keep its ability for borrowing when an


\textsuperscript{39}Brigham and Ehrhardt, 2006, Pp.64.
even better opportunity arises. So signaling cannot always be a perfect way to forecast the expectations of a firm. At the same time, it shows that the firm may use different allocations of debt/equity in trade off theory\textsuperscript{40}.

Stewart Myers (1984)\textsuperscript{41} was the one who observed the inconsistency of the trade off model and took a deeper look in the Donaldson findings. His work developed the asymmetric information approach and is recognized as the \textit{Signaling Theory}. So according to this view, the pecking order for the capital structure makes a lot of sense in a world with asymmetric information. By choosing first the internal funds, then the debt and just after that the use of equity the firms send “correct” signs for the markets and still can keep their reserve capacity to borrow and issue equity when a more suitable opportunity arise. Myers discussed also the requirement of firms for excess cash to avoid an unexpected necessity for external funds.

Graham and Harvey (2001)\textsuperscript{42} survey also analyses the pecking order theory. The results lead to the “moderate” evidence. This is attributable to the indication that for firms financial flexibility is important. When internal funds are not enough the study shows that CFOs look for issuing debt and then equity. This is especially relevant to small firms. However, the issue of equity has no relation with the inability of the company of find funds for debt. Also Broune et. al. (2006)\textsuperscript{43} study confirms that financial flexibility is not related to the pecking order theory, besides its importance.

\section*{4.5 Market Timing Theory}

Beside the logics behind the pecking order theory there is a strong counter argument to it: the \textit{market timing theory}. The idea here is to take the opportunity of the “hot market” periods to issue shares at a high price, or over-priced. This means, the leverage decreases when the cost of equity appears to be low and increases in an opposite scenario. The theory was developed after observing that American firms issue equity instead of debt in times that the market value of the firm is high compare with the book value. In opposition, if the market value is low, it was noticed that firms tend to buy back the shares.\textsuperscript{44}

The Market Timing theory assumes that there is not such thing as the Efficient Market hypothesis, otherwise the shares would be correct priced and would be no

\textsuperscript{40}Brigham and Ehrhardt, 2006, Pp. 64.
\textsuperscript{41}Myers, 1984, Pp.575-592.
\textsuperscript{43}Brounen, Jong and Koedjk, 2006, Pp. 1409-1442.
opportunity to make a profit over the “hot market”. The price needs to change over the time, for a rational or irrational reason. A central point in the discussion is if the market timing effect is a short or a long run effect. In case that it is only a short-term effect, it would be possible to consider the capital structure over the Trade Off Theory. Alti (2006) analyses the market timing in the short-term and concludes that it is important in this horizon, though it has limited significance in the long-run, when the indicators show the target debt-to-equity policy to be the guide to firm’s administration of their capital structure.

One of the first to investigate these phenomena was Luca and McDonald (1990), who investigate the behavior of the prices and the timing of issuing. Their conclusions led to see that firms will wait for a bull market in a tempt to get the most favorable prices to its shares as possible.

Baker and Wurgler (2002) are aware of the importance of market timing in the real corporate decisions. The study conducted investigates if the market timing has a short or a long run effect. The authors’ findings show the firms with lower leverage are more likely to raise funds at the bear market, instead the high leverage firms in the bull market. The effects are long and last for over a decade. Leary and Roberts (2005) explain that Baker and Wurgler conclusions are mainly a result of the cost of changing the levels of equity and debt. Firms will try to achieve their optimal capital structure, however the costs involved in issuing and redemption will make the process slow.

The market timing effect is well studied at the IPO level; Ritter and Welch (2002) affirm “It is conventional wisdom among both academics and practitioners that the quality of firms going public deteriorates as a period of high issuing volume progresses”. (Italics added).

4.6 Comparison between the main theories of capital structure
The previous sections introduce the reader to the main theories about capital structure. Also it presented some relevant information concerning the empirical

---

evidence. But what can we conclude from all that and how can we link that with the macroeconomic scenario?

The theories have concentrated their efforts in trying to explain the factors “inside” the firm that make relevant the decision for its capital structure. Empirical data have been tested extensively and the findings about the most suitable theory still are not conclusive or have little consensus among all studies. MM model was the base to all the theories, it shows the main aspects which are taken into consideration to the optimal capital structure. The trade off theory has enough empirical evidence to support itself, although the firm’ administration is still not aware of all the costs and benefits evolved in capital structure. So some factors well descript by theory are not recognized in practice. The theory proposes the balance cost and benefits of debt, the benefit mainly comes from the tax shield of the debt, which in turn varies according to the cash flows, and these, most of the time, depend on the economic scenario. At the same time, in the costs of the debt, as we saw the bankruptcy costs play a important role, it also differs depending the economy state, expansion or contraction.

The pecking order theory also is well supported, but some studies show that the presented order may not always work, specially depending of the economic scenario that the firm is involved. Moreover, it can be considered that if the firm, even with high expected growth opportunities may decide to issue debt or equity to avoid the necessity of doing that in the future at a lower return when a great investment arise.

And last the Market timing theory, which have shown to be real phenomenon even if it doesn’t have the effect in long periods. The connection with macroeconomic conditions is clear here, since the “hot markets” represent the expansion in the economy. Next it can be find a summary of all the presented theories:
### Table 4: Comparison of main Capital Structure Theories

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors</td>
<td>Franco Modigliani and Merton Miller</td>
<td>Harry DeAngelo and Ronald Masulis</td>
<td>Stewart Myers</td>
<td>Stewart Myers</td>
<td>Luca and McDonald</td>
</tr>
<tr>
<td>Main Argument</td>
<td>It doesn’t matter how the firm finance itself.</td>
<td>The composition of funding matters.</td>
<td>The firm capital structure is the combination of benefits and costs from equity and debt.</td>
<td>The firm has a priority order in its capital structure.</td>
<td>Equity issuing is use more in the periods of “hot-market”.</td>
</tr>
<tr>
<td>Merit</td>
<td>Pioneering, scientific parameters for studying the capital structure.</td>
<td>Calculate the cost of sources of capital.</td>
<td>Find the balance of funding sources.</td>
<td>Closer to business reality.</td>
<td>Demonstrate a real aspect of the issuing of equity.</td>
</tr>
<tr>
<td>Critics</td>
<td>Excess of assumptions.</td>
<td>The lower cost of capital doesn’t always mean maximization of the firm value.</td>
<td>No empirical evidence that there is a balance treatment between the costs and benefits of equity and debt.</td>
<td>Difficulties in systematic the studies.</td>
<td>Studies show limit significance of this effect in the long-run.</td>
</tr>
</tbody>
</table>

*Luca and Mcdonald are not the authors of market timing but can be recognize as one of the first to investigate the phenomenon

### 4.7 Capital Structure Pattern - Study Review

Earlier studies have been carried in attend to recognize the pattern of debt-to-equity ratio in European companies. It can be realize that the gearing of the firms can vary largely between one sector and the other.

#### Table 5: Leverage and Tax Rate by Sector - 2005

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>D/E</th>
<th>D/(D+E)</th>
<th>Tax Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Services</td>
<td>256.68%</td>
<td>71.96%</td>
<td>27.34%</td>
</tr>
<tr>
<td>Airlines</td>
<td>96.54%</td>
<td>49.12%</td>
<td>11.91%</td>
</tr>
<tr>
<td>Electric Distribution</td>
<td>51.61%</td>
<td>34.04%</td>
<td>26.05%</td>
</tr>
<tr>
<td>Application Software</td>
<td>12.61%</td>
<td>11.19%</td>
<td>27.22%</td>
</tr>
<tr>
<td>Medical Drugs</td>
<td>3.66%</td>
<td>3.53%</td>
<td>17.46%</td>
</tr>
</tbody>
</table>

Source: FFE

The results found in this study appear consistent with the expected structure of selected industries. This is because the companies involved in technology and pharmaceuticals, in this case the medicines, are not expected to have high percentage of debt as they are industries with great uncertainty. They depend on the research and the major processes are subject to product liability, making it too risky to use high debt in their capital structure. On the other hand, airlines and

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51 [http://faculty.insead.edu/peyer/FFE/Leverage%20by%20industry%20European%20Firms.doc](http://faculty.insead.edu/peyer/FFE/Leverage%20by%20industry%20European%20Firms.doc)  
Data used: January 2005; ratios based on market value of equity and debt.
providers of public services, use a higher percentage of debt, since it is expected that sectors with large and permanent fixed assets, can use them as collateral for long-term debt. The service providers stand out because their sales are more stable which makes the risk of business lower.

4.8 Capital Structure and Macroeconomic Conditions

Usually the capital structure is explained by internal factors of the firm, as discussed in all above items. However, a group of authors shows the strong relationship between capital structure and business cycles. Some texts that follow this line of thought are presented here.

Hackbarth et. al. (2006)\textsuperscript{52} paper discussed the importance of the macroeconomic conditions on credit risk and thus on the capital structure choice. These authors develop a model which indicates that the firm’s cash flow is determined by an idiosyncratic shock (level of uncertainty in firm productivity) and an aggregate shock (state of the economy). They use heavily mathematical tools to build a model that generates debt levels and leverage ratios, showing its counter cyclicality.

The conclusions found in this paper determine that firms can adjust their capital structure through the optimal level, and the adjustment cost of it depends on the economic conditions. Additionally, during expansion it is suggest that firms adjust the capital structure more regularly and by smaller amounts.

Another relevant paper for the topic is the Levy and Hennessy (2007)\textsuperscript{53} study. These authors intend to build a model that explains financing over the business cycle, considering external funds as the debt and equity rose. According to them, others scholars have made important considerations. Kashyap et al. (1993)\textsuperscript{54} showed that during narrowing moments of the monetary policy there is a clear increase in the issue of commercial paper, in contrast with the constant level of bank loans. Korajczyk and Levy (2003)\textsuperscript{55} also make a highlighting about it, they

\textsuperscript{52}Hackbarth,Miao, and Morellec, 2006, Pp. 519-550.


conclude that less constrained firms are more tend to issue debt in recession periods and, quite the opposite scenario it issue equity.

Levy and Hennessy model analyses the economic scenario and also includes the agency problems discussed in the Corporate Finance theory. The authors believe that to avoid managers to divert earnings, they should have a minimum percentage of the equity, and, at the same time, firms should maintain their book leverage low to also avoid the divert of assets. The consequence of these affirmations lead to a consistent finding in the model: in recession firms tend to substitute debt for equity as a manner to keep the level of the managerial equity shares. And in expansion periods the equity substitutes debt as the managerial wealth improves. Additionally, in their study the macroeconomic conditions represent 12%-51% of the time series variation in the selected firm’s leverage.

Their conclusions are interesting as they show that less constrained companies respond better to changes in the economic scenario due to the more developed ability to exchange between debt and equity. Their findings are supported by empirical evidence.

Cook and Tang (2008) recent work develops a model to estimate the impact of macroeconomics factors on the capital structure speed model. Their sample consisted of U.S. firms for a period of 20 years. The model uses dynamic adjustments, by allowing the debt ratio targets vary across firms and over time. As well, another careful thought was the definition of the macroeconomic factors that is responsible by the macroeconomic scenario. One of the considered items was the GDP growth rate. The author’s argument to use this was that a recession is traditionally defined by the decrease in the GDP.

These study analyses also the Hackbarth et. al. work, finding evidence that also support their conclusions. So it appears to have strong empirical evidence indicating that good macroeconomic conditions lead to faster adjustments in the capital structure to the target. Also is discussed the support of the market timing theory, as unleveraged firms have fewer incentives to adjust their debt-to-equity target ratio during an expansion of the market.

Another correlate study about the topic is Drobetz and Wanzenried (2006)\textsuperscript{57}, who investigate both specific firm factor and macroeconomics conditions that affect the speed of adjustment of the target capital structure. They discussed the unexplored influence of macroeconomic variables by using model for Swiss companies. Their result supports all the above mentioned conclusions.

As it can be seen, the macroeconomic side of the capital structure isn’t wide explored. Nonetheless, it is related to capital structure more clearly than it may appear. Take the U.S. economy for instance, for the period that preceded the current crisis, the low interest rates lead to an excess of liquidity in the market, pushing the firms to a large debt. But what can we assume and expect from all the evidence that the real economy and the previous studies have showed?

The auto financing of firms, as seen in the pecking order theory is the first source of finance for firms. It is expected that this should follow the pattern of the economy activity, as with a higher profitability the firms has more chance to finance by the retained earnings. The profitability in turn should be higher when the economy goes well. The measure for this is the GDP, as Cook and Tang (2008) discussed that the market indicates the recession periods or expansion based on the GDP of the countries. Based on this argument the GDP shouldn’t explain the increase of debt. The changes in debt can be explained, for example, in term of the changes in the cost of capital. Usually, periods of expansion are also periods with lower interest rates, encouraging the use of this funding source.

Tax rate represents the legal structure of the economy. The corporate finance theory, especially the trade off theory, already considers the role of the tax rates on the decision for the optimal capital structure. Though, none of the authors, Korajczyk and Levy (2003), Hackbarth et. al. (2006), Drobetz and Wanzenried (2006), Levy and Hennessy (2007) or Cook and Tang (2008), discussed deeply the effect of the tax rates, as an indicator of the macroeconomic conditions.

Zonenschain (1998)\textsuperscript{58} presented the importance of another popular macroeconomics measure, the inflation. Her work presents the difficult to control the effects of inflation on the available information of debt and equity of firms. Some regions don’t face such high inflation as the ones descript on the study, however the indicator has another side to be considered. As the economy is more stable, the interest of firms to capture external capital in the form of issuance shares increase. So consequently, it is expected that the Nordic region, with low


\textsuperscript{58}Zonenschain, 1998, Pp.71.
inflation, has a negative correlation between inflation and issuance of shares, or the debt-to-equity should decrease as inflation decreases.

Finally, Singh (1995) developed a study concentrating on relationship between the financial system, capital structure of firms, and the economic growth of the countries. His focus is on the developing countries, but as it compares repeatedly with the developed economies good considerations can be taken. The results indicate an inverse pattern in developing countries when compared to economies like U.S and U.K., in this last countries the pecking order is supported. The developing countries depend more in the issuance of shares than the expected given its lower level of developing of the financial market.

A more relevant point to the macroeconomic aspect from Singh work is that he argues that even if inter-country differences of capital structure pattern have been recognized very little has been said about the reasons why. The arguments concentrate on taxation regimes, transactions costs and other institutions arrangements that may intensify or mitigate the asymmetric information. Here it appears more evidently the importance of the tax rates on a analysis of the macroeconomic aspects that determine the debt level.

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5. Survey Design and Data Collection

In this chapter there will be information about how the study was conducted and how the data was collected. The calculations and hypothesis used will be presented. Moreover, I will make a self-critique of the study.

5.1 Survey Design

The first step on my study was to collect the data from different banks in the Nordic countries with the intention to calculate the past debt-to-equity ratio. Following this, an analysis of the relationship between the ratio and macroeconomic and/or financial measures was conducted. To do this correlation indexes were calculated and a regression analysis was conducted.

5.1.1 Hypothesis

I have examined the following hypothesis:

H1: The Nordic banking sector debt-to-equity ratio has a positive correlation to the region GDP.

This hypothesis is based on the trade off theory, since the expansion of economy should increase the expected cash flows, consequently the benefit of the tax shield is higher and the firms are more prompt to use debt. Also based in this fact, a second hypothesis was made.

H2: The debt-to-equity ratio has a negative correlation to the tax rate of the banking sector.

The third hypothesis considered was related to the interest rates, since these rates have influence on the borrowing and lending rate this should be correlated to the debt-to-equity ratio. At the same time, this measure gives a thermometer of the economic situation.

H3: There is a negative relationship between the interest rates and the debt-to-equity ratio.

H4: A positive correlation exists between the inflation and the debt-to-equity ratio.

Also, as the monetary stability plays an important role in the cost of borrowing and the issuing of equity, inflation should be considered.
These hypotheses were made thinking about the major macroeconomic conditions that directly affect the capital structure of the firms: the growth of the economy, the legal system, and the stability of the economy. To examine this hypothesis the study was taken by both market value and book value.

The construction of the hypotheses was based in economic indications present on chapter 4, which suggests that the business cycle is important in the determination of the financial decisions. However, there are counterarguments to the hypothesis taken. Korajczyk and Levy (2003)\textsuperscript{60} affirm a negative correlation between macroeconomic variables and debt-to-equity ratio. Firms issue securities in prosper macroeconomics periods, when the price tends to be more favorable. This goes consistent with the pecking order theory and on the contrary about the trade off theory, as agency costs become important. To align managers’ interest, including private benefit extraction, in a recession period debt increases over the equity, demonstrating the counter cyclical debt-to-equity ratio.

5.1.2 Presentation of the Statistical Tools
An analysis of the correlation of this macroeconomic indicators and the capital structure was taken. However, since this coefficients only indicate that the variables are correlated but not a cause-effect relation I have decided to take a regression analysis to investigate how much of the debt-to-equity ratio level can be explained by these measures. The decision for this approach was based on the fact that with a regression you can infer and explore about the relationship between the dependent variable (debt-to-equity ratio) and the independent variables (the macroeconomic conditions), in a cause-effect relation. I conducted a multiple regression based on the market value and also on the book value, with the 30 companies for the 6 years of data that I had. So I had 180 observations to work, however some had to be excluded due to unavailable data for a few variables. The variables used were chosen based on the correlation with the debt-to-equity, to construct the best regression possible, and also based on the correlation between them, to avoid the multicollinearity problem (when the independent variables are correlated, giving an exaggerated significant relationship).

All the statistical results present in this study were collect from the Excel. Both correlation and regression analysis were made in this software.

I will briefly present the statistical tools and techniques that were used in study.\textsuperscript{61}

\textsuperscript{60}Korajczyk and Levy, (2003).
\textsuperscript{61}http://www.statsoft.com/textbook/stmulreg.html

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**Correlation**

Correlation indicates the strength and direction of a linear relationship between two random variables. In general statistical, correlation measures the relationship between two variables, but correlation does not imply causality.

**Multivariate Linear Regression**

Linear regression is a method to estimate the conditional (expected value) of a variable y, given the values of some variable x. The linear regression is called "linear" since the relationship of the response variables is a linear function of some parameters.

Multiple regression analysis involves three or more variables, estimators. That is, a single dependent variable, but two or more independent variables (explanatory). The purpose of independent variables is improving the prediction compared with simple linear regression.

The multiple regression equation is:

\[
Y_c = a + b_1x_1 + b_2x_2 + \ldots + b_kx_k
\]

where: 
- \(a\) = intercept of the y axis;
- \(b_i\) = slope of the variable;
- \(k\) = number of independent variables.

**R square**

Measure the strength of the relationship between the variables. An additional statistic called the R-squared Adjusted R-squared is calculated from the trend that induces the R-square to keep growing when the independent variables are added to the regression.

**T test**

Is a test to determine the importance of an individual coefficient in the regression model, based on the statistical t-Student. The calculated statistical parameter, \(t_{calc}\) must be greater than the table \(t_{tab}\) (n-k-1), where k is the number of regressors in the sample size is. If \(t_{calc} > t_{tab}\), it rejects the null hypothesis of no significance of the parameter.

**F test**

Is a test of the analysis of variance, which compares the explained variation with the unexplained variation of the dependent variable. This relationship has distribution F with k (n-k-1) degrees of freedom and number of regressors. Then compares the calculated statistical parameter \(F_{calc}\) with the tabulated F (k, n-k-1). As \(F_{calc} > F_{tab}\), it rejects the null hypothesis of lack of linear relationship.

Further explanations will be present in the results of the empirical analysis.
5.2 Data Collection

5.2.1 Sampling Procedure
The data I have used for this study was collected from the Aswath Damodaran homepage\(^{62}\). The decision for choosing this database was due to the possibility to have both market and book value collected. The author organizes the data from Bloomberg and Capital IQ, having a great number of firms to work with. The other advantage is that is public information, in contrast to these other database. The disadvantage is the limited time frame of the data, only available after 2003.

I have selected from the available database, 30 banks from the Nordic countries, excluding Iceland, since there was limited data from the country. The other selection was based on the characteristics of the banking industry of each country. Based in these facts, described in the chapter 3, I have choose 15 banks from Denmark, 6 from Norway, 6 from Sweden, and 3 from Finland. (See Appendix A to the complete list of the firms) The sample tries, at the same moment, to consider the main banks in the countries and the characteristics of the market in these countries, giving larger space to Danish banks since they are more numerous. Bearing in mind this, I have taken a judgment sampling, as I have selected a group of firms from the entire population.\(^{63}\) The approach was taken because I have investigated the main banks and the importance of each in the total population, achieving a group of banks with greater and more significant participation in the Nordic Banking Sector (based on market share and profitability).

5.2.2 Calculation
The following indicators were used calculating according these formulas\(^{64}\):

*For the Ability to Auto financing of the companies*
Free Cash Flow = EBIT\(^ {65}\) (1-T) - (Capital Expenditures - Depreciation) - Change in non-cash Working Capital

*Debt*
Current liabilities plus long term liabilities but not accounts payables\(^ {66}\). Book value of debt is used as a proxy for the market values of debt.

\(^{62}\) http://pages.stern.nyu.edu/~adamodar/
\(^{64}\) Ibid.
\(^{65}\) Operational Profit
\(^{66}\) Accounts Payable is defined as payables that result from transactions with suppliers, normally are not due to more than one year. These payables can be booked at the face value and not the present value for future cash flows. Epstein and Jermakowicz, 2007, Pp.455.
**Equity**

Book values of common equity, as reported on the balance sheet, and the market value of equity.

The market capitalization would be a better measure of the real equity value, as most of theories discussed. However, the decision for the adoption of this figure has a methodology reason and will be discussed in the next section.

**Tax Rate**

Obtained by dividing the taxes paid by the taxable income, as reported to the stockholders.\(^{67}\)

**Profitability**

Net Margin = Net Income/ Net Sales

### 5.2.3 Macroeconomic data treatment

The data used for the macroeconomic aspects were the GDP, interest rate and the tax rate. The GDP was collected from the International Monetary Fund database\(^{68}\) the series used was the “Gross domestic product, deflator”. As there was not available the 2008 GDP figures, they represent an estimation made by the organization. The numbers were collected for each country and than summed, so the growth of the region could be calculated. The rates are not the real growth rates. Below is the figures used:

#### Table 6: Nordic Countries GDP Growth Rate, 2003-2008

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>1.6%</td>
<td>2.3%</td>
<td>2.9%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Finland</td>
<td>-0.4%</td>
<td>0.6%</td>
<td>0.5%</td>
<td>1.3%</td>
<td>3.2%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Norway</td>
<td>3.0%</td>
<td>5.3%</td>
<td>8.7%</td>
<td>8.5%</td>
<td>2.2%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.9%</td>
<td>0.2%</td>
<td>0.9%</td>
<td>1.7%</td>
<td>3.0%</td>
<td>3.3%</td>
</tr>
<tr>
<td><strong>Nordic Countries</strong></td>
<td><strong>1.4%</strong></td>
<td><strong>1.9%</strong></td>
<td><strong>2.9%</strong></td>
<td><strong>3.2%</strong></td>
<td><strong>2.6%</strong></td>
<td><strong>4.8%</strong></td>
</tr>
</tbody>
</table>

Source: Adapted from IMF statistics

The interest rates were collected from the IMF database as well, under the series “Discount rate (End of Period)”. To get the Nordic region basic discount rate, the weight average was calculated based on the GDP of the countries, due to the limitation of this measure, what could compromise the consistence of the

---

\(^{67}\) Taxable income is determined as the profit or loss in a period, which is establish according to the rules by the pertinent taxing authorities. Epstein and Jermakowicz, 2007, Pp.565.

\(^{68}\) [http://www.imfstatistics.org/imf/](http://www.imfstatistics.org/imf/)
correlation, a breakdown analyses of the banks by country was taken. Here is the graphic with the variance of rate:

![Figure 4: Nordic Countries Discount Rates, 2003-2008](image)

Source: Adapted from IMF statistics

Concerning the tax rates, the figures used were collected as the others firm’s indicators, from the Damodaran database. The calculation to get a weighted average for the region was made as the debt-to-equity ratio, based on the firm’s value and its percentage over the total value of the sample. Although, the real tax rate used in the analyses was of each firm, in the correspondent year, these below figure are just a representative indication of the pattern in the time frame of the investigation.

**Table 7: Nordic Countries Tax Rate, 2003-2008**

<table>
<thead>
<tr>
<th>Year</th>
<th>Tax Rate</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>29,5%</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>27,5%</td>
<td>-6,5%</td>
</tr>
<tr>
<td>2005</td>
<td>27,3%</td>
<td>-1,1%</td>
</tr>
<tr>
<td>2006</td>
<td>25,5%</td>
<td>-6,5%</td>
</tr>
<tr>
<td>2007</td>
<td>22,6%</td>
<td>-11,3%</td>
</tr>
<tr>
<td>2008</td>
<td>23,0%</td>
<td>1,8%</td>
</tr>
</tbody>
</table>

Source: Adapted from Damodaran

The inflation figures were also collected from the IMF database, the selected series was the “Inflation, average consumer prices- Annual percent change”. To reach the
region inflation I did a weighted average considering the size of each countries economy. The numbers used are the following:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>2.1%</td>
<td>1.2%</td>
<td>1.8%</td>
<td>1.9%</td>
<td>1.7%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Finland</td>
<td>1.3%</td>
<td>0.1%</td>
<td>0.8%</td>
<td>1.3%</td>
<td>1.6%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Norway</td>
<td>2.5%</td>
<td>0.5%</td>
<td>1.5%</td>
<td>2.3%</td>
<td>0.7%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Sweden</td>
<td>2.3%</td>
<td>1.0%</td>
<td>0.8%</td>
<td>1.5%</td>
<td>1.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td><strong>Nordic Countries</strong></td>
<td><strong>2.1%</strong></td>
<td><strong>0.7%</strong></td>
<td><strong>1.2%</strong></td>
<td><strong>1.8%</strong></td>
<td><strong>1.4%</strong></td>
<td><strong>3.6%</strong></td>
</tr>
</tbody>
</table>

Source: Adapted from IMF statistics

### 5.3 Loss of Data
The collected that I have taken considered 30 banks for a period of 6 years; this would provide me a large sample, so I could assume the normal distribution of the data. Unfortunately, not all the data could be used. There was missing information for a few banks; they were excluded of the calculations. Concerning, the correlation analysis and the regression conducted I have decided to take only the period 2003-2007, losing the available data for 2008. The decision was based on the discrepancy of the numbers of banks of the sample.

### 5.4 Critique of Source Used and Study Design
The decision for choosing this database has an important counterargument; there were only used open capital companies. This was intending to give a double view of the market and book value of firms, as said, however it limited the sample to the close capital firms. They were excluded of the sample. The size and the choices for the sample were based in the analyses of the market and I truly believe it gives a representative picture of the region’s banks situation, as the banks with larger operating profit in the region are included. I, however, have not the available information about the weight of the listed banks over the total banks.

As the design of the study I understand it limitations and simplifications made. However, I try to give a rough portrait of the relationship of the indicators and the macroeconomic variables. It would be needed a deeper statistics approach to recognize the real correlation, as we can’t ignore that inside firms aspects are important and most probably dependent of this variables. This approach leaves the scope of this study. Further tests to eliminate the presence of multicollinearity should be taken, but take required more complex approach of the data, what was
not my intention. So as I can’t be seen, what I tried to do was capture the relation between economic cyclical and the change in the capital structure in a straightforward and practical approach.

Regarding the regression analyses, I recognize the imperfection of the model. This can be thanks to the diverse samples I collected, which group banks with essential different characteristics, what may have compromised the indications of the analyses. Also, in the market debt-to-equity analysis, I have used the effective tax rate as an independent variable of the regression; this is based in the book value. It may have had a negative impact in my investigation, since they have essential different characteristics.
6. Empirical Analysis and Findings

This chapter will present the statistical analyses of the empirical data and their results. First, an investigation of the pattern of the debt-to-equity ratio in the Nordic banks will be conducted. And later, I will present an analysis in an attempt to explain this pattern by the macroeconomic conditions.

The empirical analysis was taken according to the research questions, and for them the chapter was structured in three sections. The first is the capital structure pattern and how it has evolved. After, a simple correlation exploration will be taken to reveal the basis for the construction of the last section of the chapter. In this part, a regression analysis will be conducted for both market and book debt-to-equity, in attempt to show the best macroeconomic variables that explain the level of the debt-to-equity ratio.

6.1 Capital Structure Pattern

In this section I will present the observed pattern in the selected groups of the Nordic Banks. The section is divided in two parts, the first with the sample debt-to-equity evolution and the auto financing of the firms. Second an individual analysis of firms of each country. A discussion is included in the topics.

6.1.1 Nordic Banks Capital Structure Analysis

The results found with the analysis of the Nordic banking industry are consisting with an expected structure of banks, since banks main financing is the deposits. Saying this it sounds correct to affirm that banks play an important role in the liquidity of the economy, in the moment they lend liquidity deposits to illiquidity borrowings. However, this actions increase the cost of bankruptcy, if the returns of the borrowing cannot overcome the payment of the deposits. To control this, banks can partially finance themselves by issuing shares. The banks face a trade off between the rigid capital structures that can maximize the external returns or the more flexible structure, which can decrease bankruptcy costs but also the liquidity of the economy.69 Below is the debt-to-equity ratio of the sample banks:

To make a weighted average, to get the sector total debt-to-equity ratio, there was used the firm’s value, in which the largest banks had a higher weight in the sample. This was conducted for both market value and book value. What can be recognizing from Figure 5 is the level of leverage of banks. In both market value and book value the gearing is above the 500%. Yet, the values for the book debt-to-equity ratio are significantly more stable than market value, since the last ones depend on the share price.

An analysis of the Free Cash Flow of the banks was taken to evaluate the banks auto financing capacity. The results showed a negative cash flow for most of the period, demonstrating the low capacity of these banks to auto finance themselves. It is a consistent finding as the debt-to-equity ratio has showed a high percentage, concluding that the banks use mainly debt in their capital structure.
6.1.2 Countries’ Comparison
As the result of the debt-to-equity ratio from the Nordic banking industry showed a significantly increase in market value in the last 2 years, I have decided to take a closer look to identify if the changes were concentrated in some countries and its larger banks or were a phenomenon of the sector.

Figure 7: Market debt-to-equity by country, 2003-2008

![Market debt-to-equity by country, 2003-2008](image)

As it can be seen the increase was larger in Norway and Denmark, but also in Sweden. An explanation is the high increase of the debt-to-equity ratio of the largest banks, in special Danske bank, that has the biggest percentage of the
average. The debt has increased relatively in book value also for Denmark and Sweden, but not for Norway. Finland has an increase in both approaches.

The reason to such a large increase in the market debt-to-equity ratios can be the negative scenario of the financial markets in the year. As the figures used the debt book value is used as a proxy for the market value and the equity is based on the share value, there is a misbalance. The debt, even if it has increased, shows a more constant value. The share value was depreciated, due to the financial market crisis. This can make the ratio show a large increase, maybe distorting the analysis. This view is based on the decrease of the market value of the banks in the world in general. The market values of the Nordic banks were not standardized and I couldn't have a complete view of the scenario. However, the U.S. banking sector had this values and have show this pattern, which leads us to believe in this idea.

![Figure 9: Market value of U.S. Commercial Banks (trillions of dollars)](Source: Adapted from Bloomberg by BNDES)

6.2 Macroeconomic conditions relations with Capital Structure

The section will present a correlation analysis of the macroeconomic conditions and the capital structure changes. To guide the reader into the conclusions, here is a summary of the significance of the correlation figures:
### Table 9: Correlation Qualitative Assessment

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Null</td>
</tr>
<tr>
<td>0.1-0.3</td>
<td>Weak</td>
</tr>
<tr>
<td>0.3-0.6</td>
<td>Regular</td>
</tr>
<tr>
<td>0.6-0.8</td>
<td>Strong</td>
</tr>
<tr>
<td>0.8-0.9</td>
<td>Very Strong</td>
</tr>
<tr>
<td>1</td>
<td>Perfect</td>
</tr>
</tbody>
</table>

The minus sign indicates the negative correlation, as the plus sign indicates a positive correlation.

**6.2.1 GDP correlation**

The first step to this investigation was to search for a relation with the GDP, as this measure signaling the current economic scenario. The calculation was based in the percentage change of the nominal values. For the Market debt-to-equity ratio the correlation with the GDP in the sample is 0.3254 and for the Book value is 0.0559. The figure indicated a positive correlation between GDP and the market value, at the other hand when considering the book value the relationship is notably weaker, and almost insignificant. Here is an interesting finding. As the market value indicates better the capacity of the firms to generate cash flow, the relationship can be considering strong, even with a weak book value correlation, as they show the historical value not the real value of the assets. The auto financing capacity also was correlated with the GDP, showing a result of -0.1620, statistically weak. This can point to the conclusion, that the macroeconomic condition has no correlation with the FCFF of the firms and with their ability to finance themselves, leaving the reason the internal aspects of the banks.

**6.2.2 Interest rate correlation**

The analysis of the interest rate with the capital structure was taken for the market debt-to-equity, equal for 0.5184, and for the book debt-to-equity, equal to 0.1388. Again here, it is found a discrepancy between market and book value. The reason could be the same as the GDP investigation. The result goes against the Korajczyk and Levy (2003)\textsuperscript{70} assumptions, of the negative correlation.

**6.2.3 Tax rate correlation**

\textsuperscript{70}Korajczyk and Levy, 2003.
Regarding the tax rate correlation, the figures where based in the percentage change of the tax rate over the period. For the market value the result is 0.3447, and the book value is 0.0829. The result indicates weak to regular correlation between the variables.

6.2.4 Inflation correlation
The inflation correlation to the debt-to-equity ratio has showed a market correlation of 0.0962 indicates a null connection, what can be assumed that inflation doesn’t plays an important role in the debt-to-equity decision. It goes against the hypothesis earlier made, since, for instance, if inflation goes up the market debt to equity will probably not modify. The book correlation indicates also a null relationship with -0.0693.

6.3 Macroeconomic and Capital Structure – Regression Analysis

6.3.1 Market Value Analysis
A regression analysis was executed with the change in the debt-to-equity ratio as the dependent variable and with the independent variables being: change in the effective tax rate, change in the GDP, Interest rate. Inflation was excluded of the analyses as it showed a value close to zero, indicating to be a not significantly independent variable. The reason is that the crucial decision in a multiple linear regression is to select the lowest number of variables to the largest explain variance. These are the results:

<table>
<thead>
<tr>
<th>Regression</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Squared</td>
<td>0.4935</td>
</tr>
<tr>
<td>Adjusted R-Squared</td>
<td>0.4783</td>
</tr>
<tr>
<td>R multiple</td>
<td>0.7025</td>
</tr>
<tr>
<td>F</td>
<td>42.8788</td>
</tr>
<tr>
<td>Sig.</td>
<td>2.3E-19</td>
</tr>
<tr>
<td>b1</td>
<td>-104.4949</td>
</tr>
<tr>
<td>b2</td>
<td>243.1616</td>
</tr>
<tr>
<td>b3</td>
<td>13014.6943</td>
</tr>
</tbody>
</table>

The equation which represents the analyses is, the regression was conducted without a constant, so the line pass through the origin (a=0):

Market D/E = -104.49 Change GDP + 243.16 Interest Rate + 13014.69 Change Tax Rate
The first step to interpret the result is look to the $R^2$, which is a measure of how much variability of dependent variable can be explained be the independent variables. The found value is 0.4935, indicating that only approximately 49% of the market debt-to-equity can be explained by these macroeconomic variables. When we look to the Adjusted $R^2$ the value slightly drops to 47.82%. Similar measure of $R^2$, but contrary to this do not increase with the inclusion of not significantly independent variables. The multiple $R$ is the correlation coefficient, in this case 0.7025, indicating a positive and strong correlation.

The F test allows us to conclude if the variables are relevant to the model; however don’t give which ones are the responsible. The null hypothesis of the test is that $Y$ (change in the market debt-to-equity ratio) doesn’t depend of the independent variable, it is rejected when MQ Regression is significantly larger than MQ residuals. In this case, MQ Regression is 15787901.56 and MQ residual is 368198.52, giving the showed F statistics of 42.87. It means we reject the null hypothesis, assuming that $y$ is a function of independent variables.

6.3.2 Book Value Analysis
A similar investigation was take for the book value, below it can be seen the results:

<table>
<thead>
<tr>
<th>Regression</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Squared</td>
<td>0.6055</td>
</tr>
<tr>
<td>Adjusted R-Squared</td>
<td>0.5919</td>
</tr>
<tr>
<td>R multiple</td>
<td>0.7781</td>
</tr>
<tr>
<td>$F$</td>
<td>67.5335</td>
</tr>
<tr>
<td>Sig.</td>
<td>1.8E-26</td>
</tr>
<tr>
<td>b1</td>
<td>4.9962</td>
</tr>
<tr>
<td>b2</td>
<td>177.5432</td>
</tr>
<tr>
<td>b3</td>
<td>-1651.2777</td>
</tr>
</tbody>
</table>

Starting with the R multiple, it has a positive strong correlation of 0.7781. For the $R^2$ the value is 0.6055 and the adjusted $R^2$ is 0.5919. The $F$ statistics indicates a rejection of the null hypothesis, with a value of 67.5335, so the independent variables explain the book debt-to-equity. For the $t$ test it indicates that the GDP is significantly variable to explain $y$. (Please see appendix B for detail information of the results).

The equation for the regression is the following:

$$
\text{Book D/E} = 4.99 \text{ Change GDP} + 177.54 \text{ Interest Rate} - 1651.28 \text{ Change Tax Rate}
$$
7. Conclusions

In this chapter I will link the theoretical approach, empirical results and analysis to try to find satisfactory answer to my research question. Also I will give some personal suggestions for future studies on the topic. And finally, give the reader information about the reliability and validity of the study, so he can evaluate the quality of the study and the conclusions.

The first step of the objective of the thesis was to investigate the pattern of the debt-to-equity ratio in the Nordic Banking Sector during the period 2003-2008. The results show a difference between the market value and the book value. The book value, as expected is more constant and has not changed largely in these 6 years. The market value, on the contrary has changed a lot, especially in the last year. It can be explained by the change in the financial scenario, as a result of the credit crisis, leading us to believe in the changes that the crisis may cause in the capital structure of the firms, in particular in the banks.

This study also attempts to search for a correlation between the observed level of debt-to-equity ratio and the macroeconomic conditions. The hypotheses considered were almost all rejected, with the exception of the first. There is empirical evidence supporting the tradeoff theory and the positive relationship between the GDP change and the debt level. Interest rate and tax rate were considered regularly correlated but not as negatively correlated as expected. Inflation has shown not to be significantly correlated.

Although correlations have not strongly supported the connection between the macroeconomic conditions and the capital structure, the regression analysis showed some interesting results. The correlation analysis as don't show a cause-effect relation is a weak form to demonstrate adjust of the debt-to-equity ratio to the economic scenario. The regression at the book value, especially, indicated that the relationship exists. The $R^2$ and F-test show that the independent variables are statistically significant. The book value analysis has, in this way, shown to be better explained by the macroeconomic factors. As discussed in the beginning, the firm’s executives prefer to guide their decisions based on the book value, due to the stability of the measure. The stronger results on this regression support it. The economic conditions affect the efforts of the administration that follows the book value ratio; consequently it has a stronger cause-effect correlation.

In banks the main trade off is between the liquidity creation and stability in a stress scenario, what consistent with a significant relationship between the capital structure and the general condition of the economy, represented by the GDP.
Overall, there is indication that the thesis of the study is supported, even if the results can have clearer limitations, since the measures are by no mean ideal.

7.1 Further Research
Even though, the capital structure is a well discussed topic, the approach taken by this study has been little investigated. Surprising, since economic intuition indicates that the macroeconomic conditions affect the decision for borrowing and issuing equity, as also the internal capacity of the firm to finance itself its projects. A natural extent of this work is to investigate deeply the relationship between the macroeconomic conditions and the level debt-to-equity ratio, taking larger sample and extending to different industries.

Another relevant issue to the future is to analyze the business cycle effect over the capital structure. It will be interesting to consider the effect of the current crisis over the financing decisions of the firms. However, this should be done in a medium term future, as to recognize any modifications, it would be necessary a more consolidated data.

This research question remains open as the macroeconomic dimension has a consequence over the financial decisions. Empirical work using larger data is needed. I leave this for a future research.

7.2 Validity
Validity is concerned with the truly measure of the conclusion of the study. The research I have conducted was based on statistics data and available from trustful databases, which gave the indicators I used. The used methodology is so applied in these kinds of study, with should lead to consistence and integral results.  

7.3 Reliability
According to Bryman and Bell (2003), reliability concerns with to the consistency of a measure of the study, whether the study can be replicated or not. It means how the data was collected and treated, and if the study was conducted over again, independently of who was doing so, the results would be the same.

As I have conducted a quantitative study, making use of statistics tools and accepted methods, I honestly believe in the high degree of confidence of my investigation. Also the collection of data was from a well known database and it would provide the same information repeatable. I have demonstrated my steps to

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71 Bryman and Bell, 2003, Pp. 74-76.
72 Ibid. Pp.77.
achieve my results, allowing other researches the access to my methodology. I am confident that the source is reliable and if another person is redoing, using the same data and the same basis the findings would be the identical.

7.4 Generalization

Last, generalization means if the results found can be applied to a larger sample. As I have discussed in the earlier chapters, the decision for this group of banks was based on the characteristics of the sector. As the Nordic region should be affected less by the globalization of the banks, concentrating the operations on the region, the relationship between the macroeconomic conditions can be more easily captured. Conducting a similar study to large and more global firms may necessitate an adjustment of the parameters.

---

73Bryman and Bell, 2003, Pp.77.
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Articles


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http://pages.stern.nyu.edu/~adamodar/

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http://www.statpac.com/surveys/sampling.htm

Swedish Crisis

Proquest
http://proquest.umi.com
### Appendix A

**List of the selected banks for the sample:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Headquarters</th>
<th>Bloomberg symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/S RINGKJOEBING BANK</td>
<td>Copenhagen</td>
<td>RIBA DC Equity</td>
</tr>
<tr>
<td>AMAGERBANKEN A/S</td>
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<td>AMAG DC Equity</td>
</tr>
<tr>
<td>DANSKE BANK A/S</td>
<td>Copenhagen</td>
<td>DANSKE DC Equity</td>
</tr>
<tr>
<td>DJURSLANDS BANK A/S</td>
<td>Copenhagen</td>
<td>DJUR DC Equity</td>
</tr>
<tr>
<td>FORSTAEDERNES BANK A/S</td>
<td>Copenhagen</td>
<td>FORST DC Equity</td>
</tr>
<tr>
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<td>Copenhagen</td>
<td>GRLA DC Equity</td>
</tr>
<tr>
<td>JYSKE BANK-REG</td>
<td>Copenhagen</td>
<td>JYSK DC Equity</td>
</tr>
<tr>
<td>LAN &amp; SPAR BANK A/S</td>
<td>Copenhagen</td>
<td>LASP DC Equity</td>
</tr>
<tr>
<td>NORDIYSKE BANK A/S</td>
<td>Copenhagen</td>
<td>NORDIB DC Equity</td>
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<td>Copenhagen</td>
<td>RILBA DC Equity</td>
</tr>
<tr>
<td>RINGKJOEBING LANDBOBANK A/S</td>
<td>Copenhagen</td>
<td>SKJE DC Equity</td>
</tr>
<tr>
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</tr>
<tr>
<td>SPAR BANK VEST AS</td>
<td>Copenhagen</td>
<td>SPBV DC Equity</td>
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<td>ALBAV FH Equity</td>
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<td>Helsinki</td>
<td>ALBBV FH Equity</td>
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<tr>
<td>OKO BANK-A</td>
<td>Helsinki</td>
<td>OKOAS FH Equity</td>
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<tr>
<td>SANDNES SPAREBANK</td>
<td>Oslo</td>
<td>SADG NO Equity</td>
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<td>SPAREBANKEN MIDT-NORGE</td>
<td>Oslo</td>
<td>MING NO Equity</td>
</tr>
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<td>SPAREBANKEN MORE-CAP CERT</td>
<td>Oslo</td>
<td>MORG NO Equity</td>
</tr>
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<td>SPAREBANKEN OST</td>
<td>Oslo</td>
<td>SPOG NO Equity</td>
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<tr>
<td>SPAREBANKEN VEST</td>
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<td>SWEDBANK AB</td>
<td>Stockholm</td>
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<td>SVENSKA HANDELSBANKEN-B SHS</td>
<td>Stockholm</td>
<td>SHBB SS Equity</td>
</tr>
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</table>
Appendix B

Additional Details of the Correlation Analysis and Multivariate Linear Regression Analysis

Sample: Market debt-to-equity ratio

<table>
<thead>
<tr>
<th></th>
<th>Market D/E</th>
<th>Change in GDP (%)</th>
<th>Interest Rate</th>
<th>Change Tax Rate</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market D/E</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in GDP (%)</td>
<td>0.3254</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
<td>0.5184</td>
<td>0.5398</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Tax Rate</td>
<td>0.3447</td>
<td>0.7745</td>
<td>0.3232</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>0.0962</td>
<td>0.1940</td>
<td>0.1236</td>
<td>0.0677</td>
<td>1</td>
</tr>
</tbody>
</table>

Regression Statistics

- Multiple R: 0.7025291
- R-Squared: 0.4935472
- Adjusted R-squared: 0.4782979
- Standard error: 606.79364
- Sample Size: 135

ANOVA

<table>
<thead>
<tr>
<th></th>
<th>g1</th>
<th>SQ</th>
<th>MQ</th>
<th>F</th>
<th>F Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3</td>
<td>47363704.69</td>
<td>15787901.56</td>
<td>42.87877514</td>
<td>2.26032E-19</td>
</tr>
<tr>
<td>Residuals</td>
<td>132</td>
<td>48602204.7</td>
<td>368198.5204</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>135</td>
<td>95965909.39</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coefficients

- Intersection: -
- Change in GDP (%): -104.4949, 95% lower: -189.318865, 95% upper: -19.67085759
- Interest Rate: 243.16162, 95% lower: 166.7634466, 95% upper: 319.5597983
- Change Tax Rate: 13014.694, 95% lower: 6929.434236, 95% upper: 19099.95437
Sample: Book debt-to-equity ratio

<table>
<thead>
<tr>
<th></th>
<th>Book D/E</th>
<th>Change in GDP (%)</th>
<th>Interest Rate</th>
<th>Change Tax Rate</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book D/E</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in GDP (%)</td>
<td>0.0559</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
<td>0.1388</td>
<td>0.5398</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Tax Rate</td>
<td>0.0829</td>
<td>0.7736</td>
<td>0.3216</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.0693</td>
<td>0.1940</td>
<td>0.1236</td>
<td>0.0679</td>
<td>1</td>
</tr>
</tbody>
</table>

Regression Statistics

- Multiple R: 0.778138716
- R-Squared: 0.605499862
- Adjusted R-squared: 0.591948829
- Standard error: 505.0396459
- Sample Size: 135

ANOVA

- gl | SQ   | MQ   | F     | F Sig. |
- --- | ---- | ---- | ----- | ------ |
- Regression | 3   | 51676341.98 | 17225447.33 | 67.53354777 | 1.84826E-26 |
- Residuals    | 132 | 33668585.83 | 255065.0439 |
- Total        | 135 | 85344927.78 |

Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>Stat t</th>
<th>P-value</th>
<th>95% lower</th>
<th>95% upper</th>
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<tr>
<td>Intersection</td>
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<td>35.69071408</td>
<td>0.139985799</td>
<td>0.888884585</td>
<td>-65.60356606</td>
<td>75.59595233</td>
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<td>Change in GDP (%)</td>
<td>4.996193136</td>
<td>35.69071408</td>
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<td>75.59595233</td>
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<tr>
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<td>3413.537397</td>
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