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Main Determinants of Corporate Debt Structure and Investigation of 'Fallen Angels'

Evidence from the Nordic countries

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Master Thesis – Department of Finance and Management Science

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Abstract

The objective to this thesis is to examine which measurable firm variables that are the main determinants of corporate debt structure amongst Nordic rated companies, and if "fallen angel" companies experience an alteration to their debt structure once downgraded. Previous studies have indicated several coherences that are proven valid for mainly the US market. Our study seeks to examine if these coherences also are applicable to the Nordic countries, and if there are other present determinants that are not discussed in previous empirical literature. On the basis of several univariate and multivariate regression models and tests, we have found evidence that support profitability, firm size, intangible assets and rating to play an integral part in determining corporate debt structure. Our results indicate that each of them is influencing the utilization of different types of instruments. However, our research does not indicate any significant changes in debt structure when "fallen angels" are downgraded.

Preface

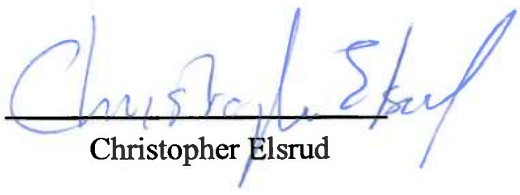
This thesis is the final step to complete our Master of Science in Financial Economics from the Norwegian School of Economics (NHH).

Debt capital markets have over the last couple of years evolved substantially. At present the bond market in Norway yields a higher daily turnover than equities, and our theme for this thesis is thus as relevant as ever.

Through our years at NHH we have experienced an increasing interest for finance. A large contributing factor to this has been the excellent corporate finance courses here at NHH, Cases in Corporate Finance in particular. Through this course we gained new insights into corporate debt structure, which ultimately lead us to write this thesis. We would thus like to thank Aksel Mjøs and Martin Evanger for an educational spring semester in 2012.

Through the process of writing this thesis we have achieved a substantial insight into corporate debt structure in the Nordic region. This has been a challenging process and we would like to express our gratefulness for the invaluable sparring sessions we have had with our supervisor, Chunbo Liu.

Bergen, 19 December 2012



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1. Introduction

This study investigates how companies chose their debt structure. Our analyses include Nordic firms which have carried a long-term credit rating by Moody's Investor Service before 2012, and an assessment of their debt structure in the period between 1st of January, 2001 and 31st of December, 2011.

The majority of empirical studies and literature on capital structure decisions treat debt as homogenous. In reality, companies have access to a wide variety in types of debt with different priority, maturity and cash flow claims. Instead of treating debt as uniform, we wish to highlight the importance of separating debt by various characteristics. We seek to answer the following research question:

Which measurable, firm specific variables are the main determinants of corporate debt structure for rated companies in the Nordics, and how is debt structure altered by a 'fallen angel-downgrade'?

To be able to answer our research question, we have conducted a comprehensive data gathering process and developed a highly accurate dataset on the debt structure of Nordic, rated companies from 2001 through 2011, and furthermore relied on univariate and multivariate regressions and statistical tests to analyse firm specific variables and their relationship to different types, sources and priorities of debt.

The study is structured in the following way. The next section contains a presentation of theories on capital structure decisions and relevant empirical research regarding debt structure. Based on the research history, we recognize that the vast majority of studies on debt structure are done on U.S. firms. The main previous study engaging this topic is Rauh and Sufi (2010).

In the third section we present our data sample and the assessed information sources in order to determine the historical debt structure of the sample companies. Furthermore, we present how the data was gathered, the classification of the final data sample, and firm specific variables assessed appropriate for analyses to answer our research question.

Based on a comprehensive dataset on debt structure, a number of regressions and statistical tests are conducted in the following section to identify the underlying relationships with firm

specific variables. Following a presentation of the results from these and an examination of the whether the debt structure of 'fallen angels' changes when downgraded, is a discussion of our findings in relation to established empirical research literature and theory. After discussing the limitations in our methodology and proposals for further research, we conclude on what we assess to be the main determinants of corporate debt structure in the Nordic countries.

2. Previous studies and literature

Classical corporate finance theory and theoretical studies on capital structure treat debt as homogenous for the most part. However, some studies recognize debt heterogeneity, and attempt to grasp the reasons for it.

2.1 Theories on capital structure decisions

There are two main theories that have gained foothold to explain how firms decide their capital structure.

2.1.1 The Trade-off Theory

The term trade-off theory is used to describe a family of related theories, all stating that firms choose their capital structure by balancing costs and benefits of alternative leverage plans (Frank & Goyal, 2007). The original version of the trade-off theory was developed in the wake of the Modigliani-Miller theorem (Modigliani & Miller, 1963), when corporate income tax was added to the irrelevance proposition (Frank & Goyal, 2007). Kraus and Litzenberger (1973) provide a classic statement of the trade-off theory as they state that the optimal leverage of a firm is determined by a trade-off between the tax benefits of debt and the bankruptcy cost. According to Myers (1984), a firm will typically set a target leverage ratio balancing debt tax shields against the cost of bankruptcy.

2.1.2 The Pecking Order Theory

The Pecking Order theory stems from Myers (1984) and asserts that the cost of financing increases with asymmetric information, and that financing comes from internal funds, debt financing and equity (Frank & Goyal, 2007). The model states that firms are ranking their preferred source of financing. Companies are first preferring internal funding if available; otherwise they are relying on external financing, preferring debt over raising equity (Myers & Majluf, 1984). The theory, in its simplest form, states that equity is a less preferred way to raise capital because when managers, that has information on the true condition of the firm, issue new equity, investors believe it is because the managers think that the firm is overvalued due to the lemon problem. As a result, the investors will place a lower value to

the new equity issue. This again, will make the managers passing from issuing equity (Cadsby, Frank & Maksimovic, 1990), and rather prefer retained earnings or debt.

2.2 Studies on debt structure

None of the theories presented in section 2.1 grasps the fact that there are many different types of debt with different characteristics, and no consistent theory has been established to uniformly grasp the properties of corporate debt structure. However, many studies have attempted to explain relationships that determine the choice of a debt structure by firms. Other empirical studies recognize that companies structure their debt into several categories with regards to type, priority and maturity and type.

Bolton and Freixas (2000) seeks to build a compliant equilibrium model of the capital market to explain some well-known stylized facts. This is done by exploring the optimal structure of bank debt, bond loans and equity. By combining ideas from several already existing theories on capital structure under asymmetric information, their model shows that bond financing is mainly found in mature and stable companies whereas bank financing and equity are the main sources of funding for risky start-ups. Bolton and Freixas (2000) state that the key distinction between bonds and bank debt is the monitoring ability of banks, and that companies turn to banks as a source of financing primarily because banks can help companies through financial distress. Furthermore, they find that high-quality firms do not value the ability of banks to investigate, and rely on arm's-length lenders to avoid additional costs of bank debt related to monitoring. This flexibility is costly because banks face costs of capital themselves. Consequently, they find that firms should move from bank to non-bank debt as rating improves, which is supported by Diamond (1991a), Chemmanur and Fulghieri (1994) and Boot and Thakor (1997).

Hackbarth, Hennessey and Leland (2007) recognize that the original trade-off theory fails to address debt structure, and seek to understand whether the trade-off theory can be used to explain corporate debt structure. They find that the theory can explain why weak firms almost solely utilize bank debt, as bank debt capacity is no constraint, and hence, the firm does not need to issue market debt to obtain the desired level of debt tax shields. In addition, they find that the trade-off theory offers explanations for why stronger companies use bank debt up to their lower debt capacity and augment with bond loans and place the bank loan senior. They also recognize that the percentage of market debt to total debt is increasing with

firm size. These findings are reconciled with several other studies, such as Houston and James (1996), Johnson (1997) and Denis and Mihov (2003).

Park (2000) investigates the reasons why lenders with monitoring duties may be senior in priority, and develops a theory of optimal debt structure with a presence of a severe moral hazard problem. The central idea is that the optimal debt contract for a firm delegates monitoring to a single lender, typically a bank. This allows the monitoring lender to utilize the full return from its monitoring activities, and is hence maximizing the monitoring incentive. Presence of other senior, non-monitoring lenders, will force the monitoring lender to share the return, and hence reduce the incentive for monitoring. According to Park, this explains why debt contracts are prioritized and why short-term debt is senior to long-term debt. Another conclusion of this theory is that maturity and covenant structures will be set according to the seniority structure.

Diamond (1991b) analyses debt maturity structure for borrowers with private information about their future credit rating. The paper seeks to understand the choice of debt maturity by firms, and how the choice is affected by their credit rating. Diamond (1991b) develops a model to explain why borrowers who rely heavily on short-term debt such as commercial paper are a mix of very high and low rated companies, while the middle rated companies use more long-term debt. The utilization of short-term debt by higher rated companies will allow them to choose to refinance when good news arrives and their rating rises. Lower rated borrowers will prefer long-term debt, but some very low rated borrowers have no choice but to use short-term debt, despite the control that it gives to lenders.

Barclay and Smith (1995) provide an empirical examination of the priority structure of corporate liabilities from 1981 through 1992 for a vast number of companies. The paper highlights the variation in priority structure across firms, and examines several hypotheses to explain this. They find that firms with high growth opportunities issue fewer fixed claims such as lease and debt, and more preferred stock. Additionally, they find that firms with higher growth prospects tend to have fixed claims that are concentrated in fewer priority classes, and that larger firms tend to have more dispersed fixed claims. Smith and Warner (1979) suggest that a firm with more growth options in its investment opportunities should have a greater portion of long-term liabilities in senior priority categories such as capitalized leases or secured debt. Barclay and Smith (1995) also find a significantly positive

relationship between frim size and the level of ordinary debt, subordinated debt, and preferred stock, but a significantly negative dependence of secured debt on firm size.

Rauh and Sufi (2007) examine the composition and priority of corporate debt for companies downgraded from investment grade to speculative grade by Moody's Investor Services (Moody's), so-called fallen angels. Based on a comprehensive dataset, they find a sharp reduction in flexible sources of debt, such as bank revolving credit facilities, commercial paper, and medium-term notes when firms are downgraded. They also show empirically that even though the availability of bank financing declines and covenants on new issues tighten after a downgrade, almost all companies in their sample continue to rely on bank financing after the downgrade. Additionally, they find an increase in the use of private placements and convertible debt, and that a substantial fraction of the sample companies spread their capital structure after the downgrade as they simultaneously issue secured bank debt with tight covenants and subordinated non-bank debt. The findings of Rauh and Sufi (2007) are consistent with theoretical models in which the composition and priority of debt claims are structured to encourage bank monitoring, such as Park (2000).

Houston and James (1996) examine determinants of the mix of private and public debt using a detailed dataset on the debt structure of 250 listed companies from 1980 to 1990. The paper finds that so-called information monopolies associated with borrowing from a single bank lender limit the use of bank debt, especially for companies with large growth prospects. Their findings also postulate that loans from several banks or borrowing in public debt markets can mitigate these information problems. However, the threshold level of the information monopoly at which a firm chooses multiple borrowing relationships is lower for larger firms, because the cost of establishing multiple borrowing relationships is likely to be considerably less than for small privately held firms.

Lasfer (1999) investigated the debt structure of UK firms, and demonstrated that corporate debt type, maturity and priority structures, and the determinants of these, are not homogenous across companies of various size. Lasfer (1999) found that smaller firms generally utilize more leasing, bank loans and overdrafts, while larger companies use bond loans, convertible and subordinated loans to a larger extent. Additionally, smaller firms were more reliable on secured debt compared to large companies which generally issued unsecured and subordinated securities. Lasfer (1999) also found a positive correlation

between firm size and maturity in his sample, because larger companies used a substantially higher fraction of long-term debt than smaller firms.

Rauh and Sufi (2010) highlight the importance of recognizing debt heterogeneity in capital-structure studies. Using an extensive dataset comprising the debt structure of public firms in the U.S., they demonstrate that treating debt as homogenous ignore a substantial capital structure variation. They find that high-credit quality firms rely almost solely on senior unsecured debt and equity as a source of financing. Additionally, they find that firms with a low credit quality in terms of credit rating use a more diversified debt structure when speaking of seniority. They show that such firms simultaneously issue subordinated bonds with loose covenants and bank debt with strict covenants.

2.3 Our study compared to previous studies

As previously mentioned the majority of studies done examining capital structure treat debt as homogenous. Now that several studies have illustrated the importance of considering variations in debt structure, more research has been conducted in this field.

The vast majority of this research is done addressing the U.S. These studies typically seek to explain empirical observations, for instance that smaller firms almost exclusively rely on bank debt while larger companies typically use market debt. These studies are generally related to a few aspects regarding debt composition, and are not intended to provide an exhaustive explanation of what determines the debt structure a company chooses.

Lasfer (1999), Barclay and Smith (1995) and Rauh and Sufi (2010) examines the relationship between different types of debt and key measures that define a company to attempt to grasp the underlying context determining how companies choose a particular debt structure over another. If they manage to do so will be up to others to determine, however, there are few studies as comprehensive and overarching that seek to map the different relationship characteristics of various debt types.

To our knowledge, no previous studies have thoroughly investigated corporate debt structure in the Nordic countries. Our study is to some extent motivated by the approach of Lasfer (1999), Barclay and Smith (1995) and Rauh and Sufi (2010), but instead of investigating total capital structure, we limit our scope to focus on debt composition.

Through this study, we seek to determine a set of firm specific, measurable variables determining debt structure for Nordic companies. Our focus will be on different types of debt and seniority. A detailed assessment of the determinants of maturity of corporate liabilities is beyond the scope of this study.

3. Data

In this section the data sample and the data gathering process used in the study are described.

The data collecting in this study has been a two-step process. First we had to identify Nordic companies with a long-term credit rating from Moody's before 2012. Second we gathered data on these companies' outstanding debt each year from 2001 through 2011.

3.1 Identifying companies

Several restrictions have been applied to refine and make an appropriate framework for the study and construct a sample of suitable companies to conduct the research on.

We have not considered financial firms such as banks and insurance companies in our sample as their leverage are strongly influenced by investor insurance schemes such as deposit insurance. In addition, their liabilities are not strictly comparable to the debt issued by nonfinancial firms (Rajan & Zingales, 1995).

The initial idea was to investigate the debt structure of Norwegian companies, but this approach would have resulted in a narrow amount of observations. Consequently, the geographical scope was extended to include all rated companies in the Nordic countries. To avoid the survivorship bias[1], the sample includes companies that have ceased to exist sometime in the sample period, either due to an acquisition or a bankruptcy (Lasfer, 1999).

A joint capability of all the companies in the sample is that they have been rated sometime in 2011 or earlier. Theoretical research has highlighted that credit quality is a primary source of variation driving corporate debt structure (Diamond, 1991a and Bolton & Freixas, 2000). Hence, we wanted to examine this relationship for our sample companies. Additionally, our empirical analysis needs a summary measure of credit quality, and to ensure uniformity and transparency in our study we have used issuer credit ratings as a joint capability in our sample.

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1 The survivorship bias refers to the results of some studies to be skewed because only companies which were successful enough to survive until the end of the period are included (Brown et al., 1992)

There are three large, international credit rating agencies (CRAs)[2]. All of these have issued credit ratings for Nordic companies, but only Moody's has their ratings publicly available through an academic subscription on their website. Hence, we have relied on the ratings from Moody's in this study (See appendix 8.1 for rating symbols). As emphasized by Rauh and Sufi (2010), the downgrades of Moody's and Standard & Poor's (S&P) are highly correlated, so we do not find it necessary to include additional ratings from S&P.

By examining the rating activity of Moody's (Moody's, 2012a) prior to 2012, a sample of all non-financial Nordic firms with an issuer credit rating sometime before 2012 has been gathered. Issuer credit ratings are not specific to any single debt issue made by a company (Rauh & Sufi, 2010). When assessing an issuer, credit rating agencies evaluate the ability and willingness of the issuer to repay the principal in correspondence with the agreed terms (Standard & Poor's, 2011). The rating of a specific issue is based on the creditworthiness of the issuer, but do also include an analysis of the issue itself. This analysis typically include an assessment of the terms and conditions of the issue, the relative seniority of the issue compared to other issues made by the company and the existence of external support or enhancement such as guarantees, collateral and insurance. Some of the relevant companies do not have an issuer credit rating. For these firms we have used proxies for issuer rating by assessing the ratings of long-term senior unsecured bonds. This approach constituted a sample of 74 companies.

To do an appropriate assessment of corporate debt structure for the relevant firms, a drastic cut in the sample size was required. The reduction in the number of observations had to be conducted due to the insufficient availability of information on debt structure for many of the companies. Some companies are so sparse with information on their outstanding debt, that they have been deemed inappropriate in the final sample because an evaluation of their debt structure would have been highly inaccurate. An assessment of their debt structure is close to impossible given the sources of information that we can access, as a rigorous analysis of their debt would require insider information. Other companies do not exist anymore, either due to bankruptcy or because they have been acquired. Consequently, some of these do have very limited available financial and other information.

[2] Standard & Poor's, Moody's Investor Service and Fitch Ratings are the three major, international credit rating agencies (Dittrich, 2007)

A few companies have such a complex debt structure with so many debt issues of various priorities and maturity, that they have been omitted pursuant to a cost-benefit assessment. All in all, we have required that enough information is available to determine the book value of the different debt types to include a company in the sample (Barclay & Smith, 1995). Including these companies in our sample would have added a large amount of unnecessary uncertainty to the data set, and could have contributed to flawed conclusions regarding corporate debt structure. An overview of the companies that this applies for and the reason for excluding them is presented in table 21 in appendix 8.2

3.2 Final sample of companies

By omitting the firms in table 21 in appendix 8.2, we achieved a final sample of 38 companies. An overview of these companies and the accompanying type of credit rating used, arranged by country, is presented in table 20 in appendix 8.2. These companies are all Nordic non-financial firms with a long-term credit rating sometime before 2012, with an assessable debt structure in accordance with available sources of information.

A sample of 38 companies is somewhat limited, and to compensate, data from 2001 to 2011 is included for each company as far as possible. Obviously, not all companies have available figures for all 11 years. Some of them were founded later than 2001, or ceased to exist before 2011. We restrict the sampling universe to firm observations in 2001 and later because of limited available information on debt structure in previous years. This refinement significantly contributed to lowering the cost of the data gathering process on debt described in section 3.3. The final sample then consists of 370 firm-year observations. Although every firm in the sample have had an issuer credit rating at some point before 2012, there are some firm-year observations where the firm does not have a credit rating. Additionally, two companies do not have a rating in the sampling period, but they have been included to not limit the sample.

3.3 Data gathering process on debt structure

For each of the 38 companies in our sample we have constructed a debt balance sheet for every year with observations from 2001 to 2011. All in all, a simultaneous assessment of a comprehensive amount of information and data has been conducted in order to determine the

characteristics of the sample companies' debt structure as accurate as possible. The data gathering process is extensive and time consuming, as companies are sparse with disclosing details on their outstanding debt in their annual reports.

To map corporate debt structure for rated companies in the Nordic countries, we have relied on four main sources. This constitutes the sample firms' annual reports and three databases; Thomson Reuters SDC Platinum (SDC Platinum), Thomson Reuters DealScan (DealScan) and Thomson Reuters One (Thomson One). In addition, we have used supplementary sources such as stock exchanges news databases and other sources such as loan prospectuses and/or other financial reports and presentations.

Our primary source of information has been the individual sample companies' annual reports. It is important to note that the companies in the sample differ in their use of reporting standards, as some have applied IFRS[3], while others are relying on U.S. GAAP[4] or national reporting standards. This may also vary between years for the same companies. As the U.S. GAAP definitions of what qualifies as or requires treatment as a financial liability are narrower than the IFRS definitions (PwC, 2012), the differences in accounting standards are important to understand. We have adjusted for these differences by treating all variables and debt items consistently, and therefore we are of the opinion that differences in accounting standards will have negligible implications for the quality of our data.

On the basis of these reports, it is fairly straightforward to recognize the total level of interest bearing debt for each company each year in the sample period. The challenge is to fully comprehend what securities the interest bearing debt actually consists of. Financial footnotes typically elaborate on the debt structure to some extent by providing some information on the properties of the companies' outstanding debt. Nevertheless, this information is general and almost exclusively insufficient or incomplete in order to ascertain the specific details in terms of debt type, priority and maturity. Maturity is beyond the scope in our testing, but it has to be assessed in order to identify the different issues To some extent, some companies use descriptive terminology such as "Floating rate long-term bank loan, due 2010" in the

[3] IFRS is short for the International Financial Reporting Standards, a standard developed to encompass the increasing interconnection of international financial markets (Hoogervorst, 2012)

[4] U.S. GAAP is short for United States General Accepted Accounting Policies and is a framework of guidelines for financial accounting (Federal Accounting Standards Advisory Board, 2012)

financial notes to describe certain issues, but this reveals nothing about the seniority of the issue or if this is a revolving credit facility or a term loan. More general, the companies typically pool several issues under broader reported categories such as "Loans from financial institution", which makes it impossible to understand the details that distinguish different issues from one another and comprehend what the debt structure consists of. In some cases even less describing categorization, such as "Other debt", is applied. When this terminology is used to explain 40-50% of the interest bearing debt of a company, it is clear that solely studying annual reports not will yield any deeper understanding of corporate debt structure.

To be able to determine something more specific about the debt structure of the companies in our sample, we had to rely on additional sources of information in most cases. By consulting SDC Platinum, Thomson One and DealScan, we gained access to a comprehensive origination-based dataset comprising historical debt issues. We have used SDC Platinum and Thomson One to identify private placements and public debt issues, and DealScan for syndicated and sole-lender bank loans. These databases have some less intuitive features and they require an effort from the user, but in return, they provide indispensable information to identify new debt issues.

SDC Platinum is a database developed by Thomson Reuters, and is one of the most comprehensive and historically extensive information sources on new issues. This is a database with information on new issues, mergers and acquisitions, syndicated loans, private equity, poison pills and more. The database provides details on the characteristics of debt issues, and is available to students at the Norwegian School of Economics (NHH).

Thomson Reuters has also developed DealScan, a database with extensive and reliable deal information on terms and conditions of the global commercial loan market. DealScan contains over 200,000 loan and bond transactions from around the globe (Harvard Business School, 2012). We mainly used this data source to complement SDC Platinum, as it in some cases include a more thorough description on loan terms and information on refinancing.

In addition we have accessed the Thomson Reuters One program online. This program is widely used by investment bankers, private equity and venture capital practitioners, consultants and lawyers (Thomson Reuters, 2012). The program features real-time market quotes, estimates, financial fundamentals, press releases, deal and transaction data, research

from Thomson Financial, and most importantly in this case; an historical overview over issued bonds with extensive deal information.

For some companies, we had to go as far back as to the 1980s to locate the necessary debt issues. Initially, we focused on SDC Platinum as our main external issue database. Soon, it became clear that this database not is exhaustive, as it is sometimes lacking certain characteristics associated with an issue. Consequently, we had to use the databases interchangeably. Typically, a bond issue can be shown in SDC Platinum without any information on any public listing, while Thomson One will state that it is listed. Another issue is evident when the databases are contradicting one other. An issue may be classified as a private bond issue in one of the databases, and a medium term note in another. This problem has been present with regards to several issues, making it difficult to assess which database that is providing the correct information. In addition, some issues are not mentioned in either of the programs, or they are lacking information which makes them unidentifiable.

When the different databases provide insufficient or conflicting information, we have accompanied them with other sources of information. This has mainly been prospectuses on bond and loan issues and other financial reports and presentations such as interim financials, capital markets day presentations and debt information on corporate websites. Prospectuses commonly run over a substantial amount of pages, and for publicly traded issues they are often found on the respective stock exchange's website by searching for the particular issue's ISIN[5]. However, they are not always easy to find. When located, however, they provide exact and reliable information on the features of a debt issue. Additionally, the stock exchanges also have news databases, such as Oslo Stock Exchange's NewsWeb (Oslo Børs, 2012), in which details on new debt issues often is included.

By applying this comprehensive approach, we have classified the relevant debt issues for the companies included in our sample. However, to be able to say something sensible about the composition of outstanding debt for each company each year, we need to understand the historical amortization, maturity and refinancing of each issue.

[5] ISIN is short for International Securities Identification Number which serves to uniformly identify a security (International Securities Identification Numbers Organisation, 2012)

Some companies enclose information with sufficient detail in the financial footnotes in order to allocate planned amortization and maturity of outstanding debt to a specific issue. However, this information is commonly stated on an aggregated level, and it is often problematic to allocate instalments to a certain issue. Again additional information is needed to fully grasp the dynamics of the debt composition. All of the three databases applied include information on maturity of the issues, and SDC Platinum and DealScan often state whether the purpose of an issue is refinancing. In addition, company announcements published on NewsWeb and similar news databases for other stock exchanges often reveal if the purpose of an issue is refinancing of existing debt. By matching this information with the repayment profile stated in the individual debt issue's prospectus and the amortization plan in the financial footnotes, we were able to grasp the retirements and renegotiations of a significant fraction of the sample firms' outstanding debt.

The comprehensive process outlined above made us able to create an origination debt balance sheet for each company in the sample, i.e. the debt composition of the company in the first year included in the database. By relying on the data sources mentioned, we mapped the new debt issues for each company during the 11 year period. Furthermore, we had to track the maturity profile and refinancing of these issues, and also how a company's interest bearing debt was affected by M&A activity, divestments and other corporate actions. This yielded a debt composition balance sheet for each company each year with observations.

3.4 Categorization of debt issues

In financial terms, interest bearing debt describes a situation where the lender charges a fee for the right to borrow money. Interest bearing debt can thus take several different forms. The main categories are bonds and bank loans. The debt can have different types of seniority and may be available to the public through an exchange listing. We have in the following presented definitions on types of debt that we will use to classify different types of debt into categories.

3.4.1 Bonds

Bonds are in its simplest form a contract between two parties where one or more creditors lend an amount to a borrower at the issue date and receive interest on pre-specified dates

(Mjøs, 2012). Bonds can, however, have several different characteristics, often rather overlapping. We have presented the definitions of the main types of bonds in the following.

Regular/straight bonds are instruments that share several similarities with syndicated term loans, only without instalments. A bond is issued at the settlement date and paid back to the bondholders at maturity. The borrower receives a principal equal to the face value of the bond at the issue date and pay coupons (interest) which is measured as a percentage of the principal amount (Fabozzi, 2005). The regular/straight bonds can either have a fixed or a floating coupon rate.

Zero-coupon bonds are identical to regular bonds with the exception that the borrower does not pay a coupon rate to the bondholders. The investors in zero-coupon bonds typically receive interest because the bond is issued at a heavy discount to the face value (Fabozzi, 2005).

Medium-term notes (MTN) are bonds originally created to fill the gap between short term borrowings (such as commercial papers) and long-term regular bonds. When corporations engage in medium-term note programs a base prospectus for future issues is created. This prospectus states a maximum amount that the corporation might borrow under the given program. Due to the base prospectus each individual issue meets lower requirements for documentation than a regular bond. MTNs are typically unsecured debt issues with fixed-coupon rates carrying an investment-grade rating (Fabozzi, 2005), however, issues within one program might have different nominal yield, maturity, coupons, principal currency etc. depending on issuers need or market demand. Book running is normally performed under a best-effort underwriting basis (Fabozzi, 2005).

Shelf debt is a type of medium term note where the corporation is allowed to register a base prospectus and where the corporation does not have to prepare separate prospectus for each offering.

Commercial paper is a type of short-term, unsecured borrowing issued at a discount where the borrower normally does not pay any interest. A commercial paper normally matures within 270 days as this exempts the paper for SEC registration in the American market (Fabozzi, 2005).

Convertible debt is similar to regular bonds, but in addition to the "regular bond" the holder has the right to call the bonds, thus converting parts or the entire principal to equity at a conversion price under pre specified conditions (Berk & DeMarzo, 2011).

Public bond issues can be either one of the above mentioned bonds. In order for a bond to be defined as public it has to be available to the public through an exchange listing. Opposed to public bonds are *private bonds*. These bonds can be offered to investors in several ways, but the common denominator is that the bonds are not listed at any exchange after the issue (Mjøs, 2012).

3.4.2 Bank loans

Bank loans are either provided by one bank on a bilateral basis, or as syndicate where several banks go together in order to raise money to lend to the borrower. Bank loans normally take one of two forms; term loan or revolving credit.

Term loans are similar to regular bonds, the principal is issued at face value, and the borrower pays a coupon rate on a predefined, either fixed or floating, rate. As opposed to regular bonds the bank debt is normally amortized during the maturity period.

Revolving credit facilities are credit facilities where corporations can draw funds until a certain limit whenever it suits the borrower. Interests are a result of the size of the funds and at what the time the funds are repaid. In addition the borrowers normally pay a low interest in order to have access to the facility.

3.4.3 Mezzanine capital

Some financial instruments have both debt and equity characteristics. This includes normal convertible debt which is defined above. Convertible debt will typically be presented as debt in a company's balance sheet. However, there are hybrid capital that occasionally will be presented as equity. Mezzanine capital refers to subordinated debt or preferred shares that have a claim on the firm's asset only senior to common shares. Preferred shares are not entitled to a normal dividend, but an annual interest (Fabozzi, 2005). A firm is not obliged to pay this interest as long as the firm does not pay dividend to the other shareholder. In such cases the firm will have to pay the holder of the preferred shared the accrued interest before dividends can be granted.

3.4.4 Debt seniority

Capital raised by a firm has claims on a firm's future cash flow. However, different type of capital has different risk profiles. A firm is contractual to pay accrued interest and repay debt when it matures as opposed to equity which can be considered as a residual claim on a firm's assets and cash flow. Debt can also be divided into different layers with different seniority.

Senior secured debt is the most senior type of debt. A senior secured debt issue has specific assets, collateralized to the claim. For holding companies, these assets can be securities owned in other companies. In a default situation the specified collateral will be liquidated or transferred to the creditor to cover the claims. If an issue is collateralized directly with a tangible asset, as for instance real property and not securities, it is called a *mortgage* (Fabozzi, 2005). A *mortgage bond* grants the bondholder a first-mortgage lien on the pledged assets. A lien is a legal right to sell mortgaged property to satisfy unpaid obligations to bondholders (Fabozzi, 2005).

Senior unsecured debt is not collateralized by any specific asset but is prioritized above the subordinated debt, which is only senior to equity (Fabozzi, 2005).

3.4.5 Final categorization

Based on the presentation of various types of debt above, the descriptions in the companies' financial footnotes and the information in the databases we have assessed presented in section 3.3, we have classified each debt issue for the 38 sample companies in seven broader categories. This pooling of similar issues is conducted based on the method presented by Rauh and Sufi (2010), with refinements for Nordic debt characteristics, in order not to make the data sample too complex for conducting testing and regressions. The categories are:

1. *Bank debt*

   Bank debt includes two main categories, namely revolving credit facilities and term loans. Each of these broad categories is divided in secured, senior unsecured and subordinated issues.
2. *Bonds*

   Bonds constitute public and private placement bond issues, as well as revenue bonds. Each of these three main categories is further divided by seniority, and we distinguish between secured, senior unsecured and subordinated bonds.

3. *Program debt*

   Program debt consists of commercial paper, medium term notes and shelf-registered debt. MTNs are divided between public and private issues, and further separated on seniority similar to bonds and bank loans.

4. *Mortgage debt*

   Mortgage debt is secured by definition and no further classification has been done.

5. *Convertible debt*

6. *Mezzanine debt*

   Convertible debt is further separated by seniority in senior unsecured and subordinated issues.

7. *Other debt*

   Other debt is divided between acquisition notes, capitalized leases, and loans from corporations. In addition a subcategory labelled unclassified is included.

This classification of debt has been done based on what we believe is most appropriate when assessing the types of debt we have come across in the process of gathering data, and based on previous studies and literature (Mjøs, 2012 and Rauh & Sufi, 2010). Due to the properties of the different debt types, some categorizations are self-evident. Bank debt normally takes one of two forms, so the separation of revolving credit facilities and term loans is necessary to say something more specific on the structure of bank debt.

Regular corporate bonds, both public and private, have been pooled in the same category. Additionally, some companies had outstanding *revenue* bonds during the sample period which have been included in the category. Revenue bonds are a type of security typically issued for project or enterprise financing, in which the borrowers pledge to the bondholder the generated revenues from the financed operations (Fabozzi, 2005).

Medium-term notes, commercial paper and shelf registered debt have been included under a broader category labelled *Program debt*. These debt types differ from regular corporate bonds in the way they are initially distributed to investors and reported to the authorities. Corporate bonds are typically underwritten by investment bankers, while MTNs and shelf-registered debt are mainly offered on a best-effort[6] basis. Additionally, MTNs are usually

[6] When an investment bank underwrites the issue, they guarantee for the issue amount. A best-effort basis refers to the investment bank not taking any risk on not filling the issue (Berk & DeMarzo, 2011)

sold in smaller amounts relatively continuously, while regular bonds are sold in large, discrete offerings (Fabozzi, 2005). Commercial paper can be seen as a short-term version of MTNs, and consequently we find it suitable to pool these different types of fixed income securities.

Mortgage debt is included as an individual category. In this category we have included bank and bond loans with a first-mortgage lien on physical assets. We did not include these bank issues under for instance the *bank debt* category, because mortgage debt does not share the same necessity for monitoring as regular secured bank debt does. This is because a mortgage has pledged physical assets, while a secured bank loan can have security in securities owned in subsidiaries or other financial assets. In order to not undermine this property regarding mortgage debt, we included these issues in a separate category.

We have separated convertible and mezzanine debt. All straight bonds including a warrant to convert a claim in to equity are considered as convertible debt issues (Berk & DeMarzo, 2011). The category labelled mezzanine debt includes hybrid instruments with payment in kind containing features of both debt and equity, lying somewhere between debt and common equity. The rationale for distinguishing between these two is the property of mezzanine to enhance liquidity.

Remaining issues have been pooled in a category labelled *other debt*. This includes claims that do not fit well under any of the other categories, as for example acquisition notes, capitalized leases, and loans from other corporations. Capitalized leases is viewed as an acquisition for accounting purposes, and the present value of the future lease payments is listed as a liability (Berk & DeMarzo, 2011). This category also includes unclassified issues, i.e. issues that cannot be justified to classify given the available information.

Regarding seniority, an issue has been declared secured if the firm states that the issue is collateralized by some of the firm's assets, or if the issue is a mortgage bond. An issue has been considered subordinated if the description of the issue includes "subordinated". An issue that does not fall in to either of the two mentioned categories is considered as senior unsecured. This is a fairly coarse classification, but it is supported as an influential determinant of cash-flow and control rights in a bankruptcy process by both Barclay and Smith (1995) and Baird and Rasmussen (2006).

3.5 Financial accounting data and proxy variables

In order to investigate the objectives stipulated in section 2.3, we have examined a number of proxy variables to investigate the relationship between firm specific measures and debt structure. We have included the variables we believe to have a significant effect on the choice of debt structure, and have chosen these variables based on our preliminary assessments and findings of previous studies. In this section, these variables are presented. Our main source of financial accounting data has been the annual reports of the companies in our final sample.

Previous studies have emphasized firm size as an important measure when speaking of corporate debt structure. Theoretical research has proposed several methods of approximating firm size. We have derived a proxy for firm size by calculating the natural logarithm of sales in the income statement for each firm. This approach is supported by Rauh and Sufi (2010), while Barclay and Smith (1995) suggest using the logarithm of total assets. Lasfer (1999) uses market capitalization as a proxy, but emphasizes, as do Barclay and Smith (1995), that using sales as an alternative proxy is not significantly altering the results.

We have also included profitability as a variable, as previous research has elucidated this as an important variable for leverage. Profitability is integral part of a company's probability of default (Mjøs, 2012). Companies that are unprofitable have a higher bankruptcy risk than profitable companies because they continuously will be dependent on providing external funding to fund the deficits. Once investors stop providing equity to the company and if it not turns profitable, inevitability the company will default on its debt at some point. Rating and profitability should thus prove to have some of the same characteristics on debt utilization. However, rating also includes other aspects, such as loss given default, and rating and profitability is thus not expected to yield the same results. Fama and French (2002) recognized that more profitable firms are less levered, and also suggested EBIT to end-of-year total assets as a proxy for expected profitability of assets in place. Other studies (Barclay & Smith, 1995 and Rauh & Sufi, 2010) suggest using the companies' level of earnings before interest and taxes (EBIT) to total sales. We have used the latter approximation variable to assess profitability.

We have also assessed credit rating to be an important variable, and included rating from Moody's as a summary measure of credit quality and the quality of the company. Theoretical

research has established credit rating as one of the main variables driving debt structure (Diamond, 1991a and Bolton & Freixas, 2000), and is consequently adequate to include.

Tangibility has also been examined, as we assess this figure to be relevant for debt structure, and a proxy for debt capacity due to its opportunity to be used as collateral for mortgages or other secured loans (Titman & Wessels, 1988). We have used intangible assets ratio[7], which will be negatively related to collateral value. Information on intangible assets can easily be obtained from companies' annual reports. Previous research has recognized a positive relationship between tangibility and leverage (Rauh & Sufi, 2010) and that firms with more tangible assets, easily valued are expected to have lower costs of financial distress (Pulvino, 1998). Consequently, we believe tangibility to be relevant for Nordic debt structure.

Growth prospects have also been established as an important parameter affecting the choice of priority structure of debt (Barclay & Smith, 1995). Fama and French (2002) recognized that firms with more investment opportunities have less market leverage. Market-to-book is well established as a proxy for growth potential through future investments, and to assess the market-to-book ratio for our sample firms, we have relied on Thomson One. This program includes figures on historical market capitalization for listed companies. As not all of our companies are public, some firms in the sample do not have a market-to-book ratio.

We have also included the NACE[8]-codes of each company in order to say something about the relationship between debt structure and the specific industry the company operates within. NACE is the European standard classification of productive economic activities (Eurostat, 2012). NACE consists of a hierarchical structure, with the first level consisting of 21 headings identified by an alphabetical code describing overall industry (European Commission, 2012). The hierarchical structure consists of four levels, but we have only assessed the first level in our analyses for regression purposes in order to allow companies to pool in the same category. The NACE codes where gathered from the websites of the European Commission (European Commission, 2012), and a list of the classification for the sample companies is listed in appendix 8.3. The companies with much diversified operations

[7] We have defined intangible asset ratio as total intangible assets divided by total capital.

[8] NACE is a French acronym, which translated to English is short for General Industrial Classification of Economic Activities within the European Communities (Eurostat, 2012).

have not been classified, as they can be directly associated with two or more main categories.

According to the trade-off theory, tax should encourage companies to borrow because of the tax shields (Kraus & Litzenberger, 1973). However, the positive relationship between taxation and debt is not expected for all types of debt, as for example leasing[9] should be negatively correlated to a company's tax liability (Lasfer, 1999). According to this, an examination of the relationship between tax and debt structure for Nordic countries could be interesting. However, typical proxies for the effective marginal tax rate of companies also seem to include other firm characteristics such as investment opportunities or likelihood of financial distress (Barclay & Smith, 1995). Providing an accurate test of this will require proxies that are better in isolating companies' tax status. Consequently, we have not assessed tax as a variable in our models as we have considered the process of determining the exact level of tax shields to yield an insufficiently accurate result.

9 Leasing is senior to secured, senior unsecured and subordinated debt. (Barclay & Smith, 1995)

4. Findings and analysis

In this section we will present our findings, and discuss these findings in the light of previous empirical studies and established corporate finance theory. The first part of this section contains summary statistics which presents an overview of the data sample we have collected. The second part of this section is our main section and introduces a number of univariate and multivariate tests and regression models that seek to examine which measurable, firm specific variables that determine corporate debt structure. The third part of this section is an assessment on whether companies tend to alter their debt structure even if certain firm specific variables stay constant. The last part of this section seeks to examine if there are any significant change to debt structure when firms get downgraded from investment grade to speculative grade by the credit rating agency, Moody's.

4.1 Summary statistics

Our data consists of eleven years of observation for 38 firms, totalling 370 observations, coming from five different countries. Table 1 panel A presents an overall summary of debt structure. The average represents the average utilization between 2001 and 2011. The "annual standard deviation" is the standard deviation amongst the annual averages, whereas "total standard deviation" is the standard deviation amongst all of the 370 observations.

Panel B presents what the average level of firm variables have been between 2001 and 2011. Panel C, on the other hand, presents the average debt utilization divided by which country the observation originates from.

TABLE 1 - UTILIZATION OF DIFFERENT DEBT CLASSES

Panel A presents how Nordic rated companies on average utilize different debt classes in percentage of total interest bearing debt. The annual standard deviation, max and min represent the standard deviation, maximum and minimum values amongst the annual averages, whereas the total standard deviation, max and min represent the standard deviation, maximum and minimum value amongst all of our 370 observations. Panel B illustrates the average value of certain key firm variables, whereas panel C presents average debt utilization divided by country. The figures are based on 370 observations, except Rating and Market/Book which are based on 272 and 246, respectively.

Panel A - Overview of average debt utilization

Debt Instruments	Average	Annual St.dev	Annual Max	Annual Min	Total Median	Total St.dev	Total Max	Total Min
Bank loans	0.287	0.029	0.328	0.211	0.193	0.295	1.000	0.000
Bonds	0.202	0.040	0.269	0.151	0.086	0.250	0.975	0.000
Program	0.320	0.026	0.361	0.267	0.239	0.317	1.000	0.000
Mortgage	0.037	0.010	0.053	0.024	0.000	0.111	0.690	0.000
Convertible	0.014	0.007	0.028	0.004	0.000	0.065	0.662	0.000
Mezzanine	0.005	0.004	0.015	0.000	0.000	0.041	0.533	0.000
Other	0.136	0.014	0.177	0.121	0.077	0.155	0.815	0.000

Panel B - Average firm variables

Firm Variables	Average	Annual St.dev	Annual Max	Annual Min	Total Median	Total St.dev	Total Max	Total Min
EBIT/Sales	0.105	0.031	0.157	0.037	0.097	0.251	0.731	-3.732
Ln(Sales)	8.254	0.103	8.390	7.996	8.643	1.631	11.007	-1.895
Intangibility ratio	0.348	0.024	0.398	0.301	0.175	0.379	2.313	0.000
Rating	3.834	0.359	4.344	3.267	4.000	1.285	8.000	1.000
Market/Book	2.813	0.990	5.296	1.926	1.900	4.717	54.900	0.000
Net leverage ratio	0.225	0.073	0.349	0.095	0.368	0.580	1.281	-4.244
Gross leverage ratio	0.629	0.020	0.674	0.599	0.633	0.149	1.110	0.048

Panel C - Debt utilization by country

Country	(1) Bank	(2) Bonds	(3) Program	(4) Mortgage	(5) Convertible	(6) Mezzanine	(7) Other
Denmark	0.497	0.077	0.214	0.090	0.000	0.038	0.085
Finland	0.228	0.295	0.311	0.000	0.002	0.000	0.165
Iceland	0.388	0.110	0.344	0.000	0.000	0.000	0.158
Norway	0.235	0.329	0.296	0.029	0.021	0.000	0.089
Seweden	0.235	0.162	0.375	0.044	0.020	0.000	0.165

Table 1 indicates that certain debt classes are more utilized than others. This is as expected as our categories, as explained in section 3.4, have been defined on the basis of debt class' attributes. We have not taken into account that the different classes contain a diverse amount of sub categories. This leads some categories to cover more types of debt than others. A different classification would, however, limit the interpretation of the data as the attributes then would have varied too much within each class.

The most utilized debt categories are bank loans, bonds and program debt, with utilization rates of 28.4%, 20.2% and 31.9%, respectively. These three categories make up most of Nordic countries utilized debt instruments, and accounts for approximately 80% of all debt. Mortgage, convertible and mezzanine debt are utilized in a much smaller extent, 3.7%, 1.4% and 0.5%, respectively.

The standard deviations presented in panel A indicate that there are rather substantial differences in corporate debt structure amongst Nordic rate companies. This is reflected by a total standard deviation being approximately equal in size as the averages for bank loans, bonds and program debt. The standard deviations are 29.5%, 25.0% and 31.8% respectively compared to averages of 28.7%, 20.2% and 32.0%. Mortgage has a standard deviation of 11.1% compared to an average of 3.7%, convertible debt has a standard deviation of 6.6% compared to an average 1.4%, mezzanine has a standard deviation of 4.1% compared to an average of 0.5%, whereas other debt has a standard deviation of 15.5% compared to an average of 13.6%.

The maximum and minimum values are divergent. Bank loans, bonds and program debt has a maximum utilization of 100% or close to 100% (bonds having 97.5%), and 0.0% as minimum. As showed in previous paper (Rauh & Sufi, 2010), these types of debt instrument are normally a company's main credit lines. Mortgage, convertible and mezzanine have lower maximum values. These are typically considered as complementary debt instruments, and the maximum values are 69.0%, 62.2% and 53.3% respectively.

Panel B presents several average key ratio values for the years 2001 to 2011. There are large discrepancies between the standard deviation amongst the different ratios. The profitability has on average been 10.5% measured as EBIT/Sales. The standard deviation is, however, more than twice the size of the average at 25.1%. The other end of the scale is gross leverage ratio. Nordic rated companies has on average had 62.9% gross leverage ratio between 2001 and 2011, with a low standard deviation at 14.9%. As seen from the table, our sample firms spread out over credit ratings Aaa to Cc, market to book values of 5.4 to 0.0 and intangibility ratios of 231.3% to 0.0%. This indicates that our data sample is divers, and that it includes the whole range of companies, from good performers to companies that perform poorly

Panel C presents the utilization averages divided by country. Iceland is the country utilizing the highest fraction of bank debt, 38.8% of total debt. Norway is the country utilizing the

highest fraction of bonds, 32.9% of total debt, whereas Sweden is the primary issuer of program debt with a utilization rate at 37.5%. Convertibles are not utilized amongst Finish rated companies, whereas mortgage is utilized in Finland and Iceland. Mezzanine is only utilized amongst Danish rated companies. Panel C indicates that national characteristics should prove to be having a significant influence on companies' debt structure.

Table 1 indicates that there is a certain portion of standard deviation between the different annual averages. In order to examine how utilization of different debt instruments have evolved between 2001 and 2011 we have computed a figure to examine if there seems to be certain trends in debt structures amongst Nordic rated companies. Figure 1 illustrates the development of the different debt fractions between 2001 and 2011. Bank loans were at the end of 2011 utilized less than in 2001 (with utilization ratios at 30% and 31% respectively, however, the utilization ratio has increased significantly from 2003 an onwards, where the fraction of utilized bonds was all time low at 21% of total debt. The fraction of bond utilization grew from 22% to 27% utilization rate from 2001 to 2004. There have been a declining trend since, and the fraction of utilized bonds is today 17% of total debt. Program debt has had the opposite trend growing from a utilization ratio of 29% of total debt in 2001 to 36% of total debt today. Mortgage debt increased from 3% utilization in 2002 to 5% in 2003, 2004 and 2005 before it fell back to 3%. Convertible utilization has been rather steady around 1% and 2% utilization rate, peaking in 2009 at 3%. Mezzanine, on the other hand has been insignificant all the years except 2006 to 2009.

Figure 1 indicates that there was a substantial change in debt structure from 2006 to 2010, with bank loans increasing substantially in utilization prior to the financial crises in 2008. A possible explanation for this might be the increasingly popular phenomenon of securitization, which in effect increases banks credit and gives companies access to bank loans with low yield. From the figure, this situation seems to be somewhat reversed after the finance crises, when program debt appears to have increased at the expense of bank loans.

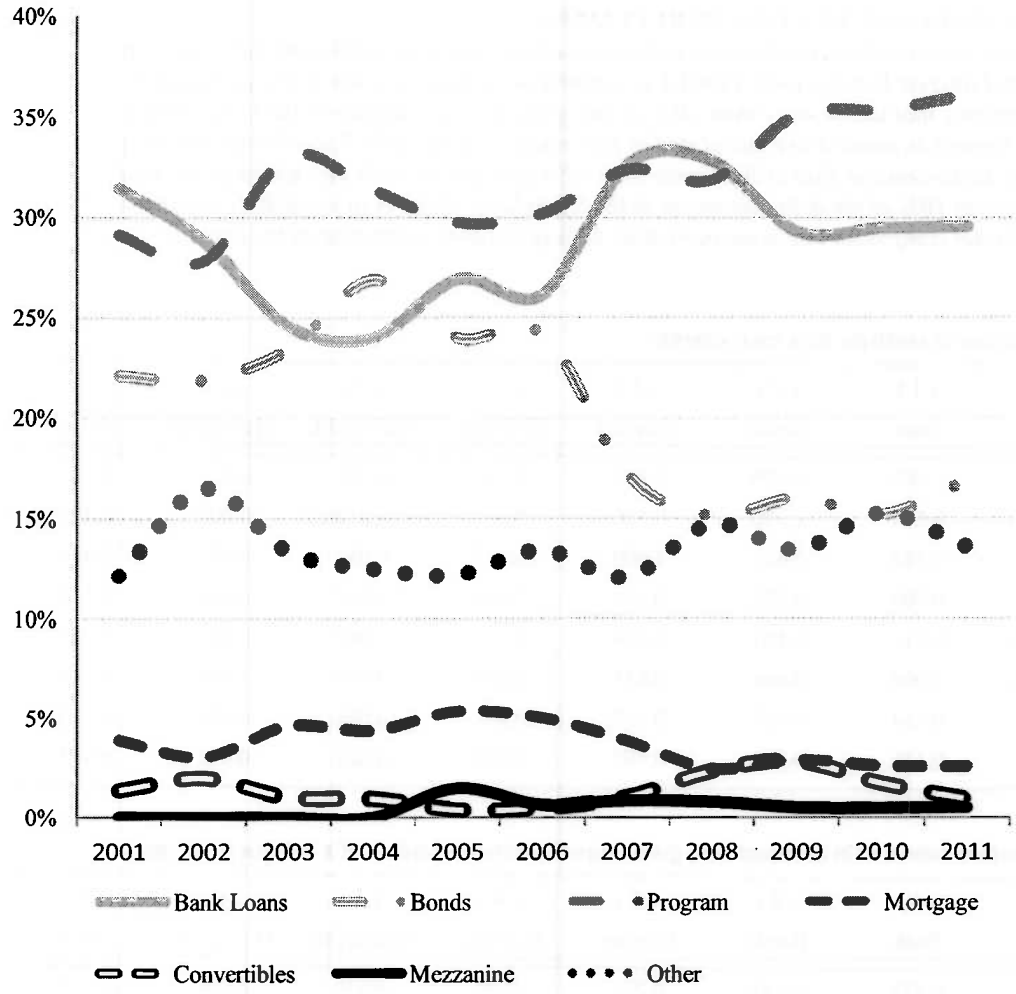

FIGURE 1 – HISTORICAL DEVELOPMENT OF DEBT UTILIZATION

The following figure illustrates how the utilization of different debt instruments have developed throughout our observation period. The amounts are scaled by total debt.

The summery statistic so far treats debt categories one by one. However, our data indicates that companies tend to utilize more than one debt instrument simultaneously. In order to clearly grasp this phenomenon we have constructed two matrixes that present the extent of companies making use of another debt instrument if they utilize more than 10% of a certain instrument.

TABLE 2 - UTILIZATION OF MULTIPLE DEBT CLASSES

The following table presents how Nordic rated companies on average utilize different debt classes in percentage of total interest bearing debt. Panel A is a matrix presenting how much of a certain debt instrument a company, that utilize more than 10% of one of the debt instruments in the left column, on average utilize. Figures in panel A are calculated as percentage of total debt. Panel B indicates how many companies, in percentage, that utilizes more than 10% of a specific debt instrument given, that they utilize more than 10% of the debt instrument in the left column. Figures in panel B, is measured as percentage of total companies that issue more than 10% of the debt instrument in the left side column.

Panel A - Utilization of multiple debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Instruments	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
Bank >10%	1.000	0.496	0.492	0.119	0.045	0.029	0.361
Bonds >10%	0.676	1.000	0.520	0.067	0.017	0.000	0.402
Program >10%	0.543	0.421	1.000	0.027	0.032	0.027	0.489
Mortgage >10%	0.906	0.375	0.188	1.000	0.063	0.000	0.250
Convertible >10%	0.611	0.167	0.389	0.111	1.000	0.000	0.222
Mezzanine >10%	1.000	0.000	0.857	0.000	0.000	1.000	0.143
Other >10%	0.564	0.462	0.692	0.051	0.026	0.006	1.000
Public >10%	0.576	0.529	0.808	0.024	0.027	0.012	0.463

Panel B - Utilization rate of debt instruments, given significantly utilization of a certain instrument

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Instruments	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
Bank >10%	0.426	0.187	0.208	0.048	0.010	0.008	0.113
Bonds >10%	0.215	0.397	0.221	0.035	0.008	0.000	0.123
Program >10%	0.161	0.139	0.534	0.009	0.007	0.006	0.143
Mortgage >10%	0.383	0.091	0.051	0.352	0.007	0.000	0.116
Convertible >10%	0.373	0.071	0.188	0.037	0.260	0.000	0.071
Mezzanine >10%	0.316	0.000	0.349	0.027	0.000	0.277	0.032
Other >10%	0.172	0.176	0.358	0.016	0.004	0.001	0.273
Public >10%	0.312	0.204	0.281	0.040	0.015	0.006	0.143

Panel A illustrates how many companies that on average utilize a particular debt instrument given that they utilize a fraction higher than 10% of another debt instrument. This table illustrates the phenomenon that companies tend to make use of several debt structures simultaneously. On average 49.8% of all the companies that utilize a higher fraction than 10% of bank loans also utilize bonds, 49.4% utilize program debt, 11.9% utilize mortgage debt, 4.5% utilize convertibles, 2.9% utilize Mezzanine debt, whereas 36.2% utilize other debt. Interesting aspects are that amongst companies utilizing mortgage debt, over 90.6% also utilize bank loans, 60.1% of the companies utilizing convertibles utilize bank loans, whereas 100% of the companies utilizing mezzanine

also utilize bank loans, clearly indicating that mortgage, convertible and mezzanine debt seldom are a company's main credit line.

Panel B reveals how much companies utilize of a certain debt instrument if they utilize more than 10%. Thus companies that utilize a significant portion of bank debt (significant implying more than 10%) utilize 42.3%. This implies that the company utilizes more than 57.7% percentage of other debt instruments as well. On average companies utilize 18.7% bonds, 20.9% program debt, 4.8% mortgage, 1.0% convertible and 0.8% mezzanine simultaneously as the utilize more than 10% bank debt. None of the defined debt instruments have utilization fractions higher than 53.5%, which is the average utilization level of program debt amongst the companies that utilize more than 10% of this specific instrument. This leaves room to design corporate debt structure in specific ways, depending on what situation the company finds itself in. This demonstrates why it is interesting to examine what determines corporate debt structure by itself and not just as a part of corporate capital structure, where debt often is treated rather homogeneous (Rauh & Sufi, 2010).

A company's credit rating is thought to have a severe impact on corporate debt structure (Rauh & Sufi, 2007), as a credit rating is supposed to reflect probability of default and loss given default (Moody's, 2012b). Figure 1 and 2 presents how companies with different corporate rating utilize debt on average. The debt is divided into four categories, two representing the investment grade companies, and two representing the speculative grade companies.

Figure 2 illustrate that equity is the main funding for all types of rated firms. The fraction varies quite substantially, however. Poorly rated companies utilize more than 60% equity on average. Mid-range companies utilize 34% on average, whereas the best rated firms utilize 47%. Whether a company is investment grade or not does not seems to influence the equity level in particular as the leverage ratio is equal between the A/Baa rated group and the Ba/B rated group. The only utilization rate that differ substantially between the two groups are bank and program debt, being 13% and 29% for A/Baa rated and 23% and 8% for Ba/B rated, respectively.

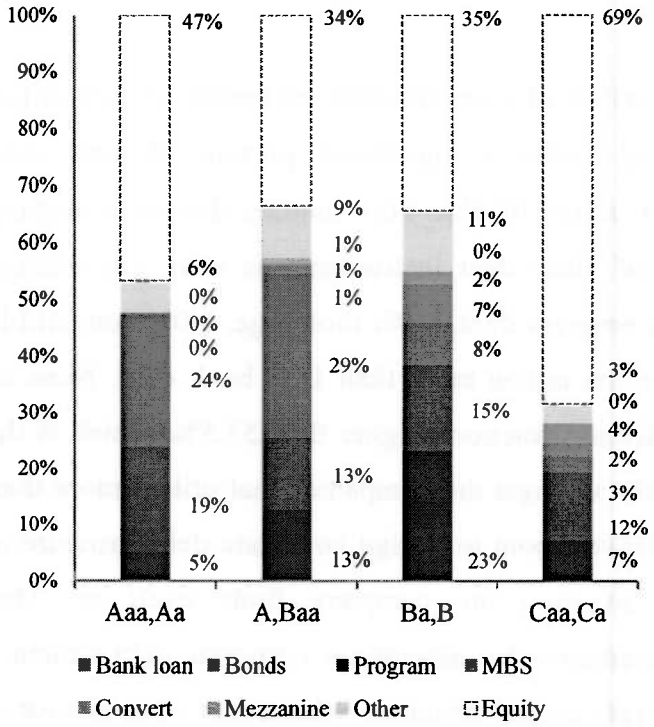

FIGURE 2 – CAPITAL STRUCTURE BY RATING

Figure 2 presents the average capital structure of Nordic rated firms categorised by rating. The numbers are measured in percentage of total capital, defined as interest bearing debt and equity

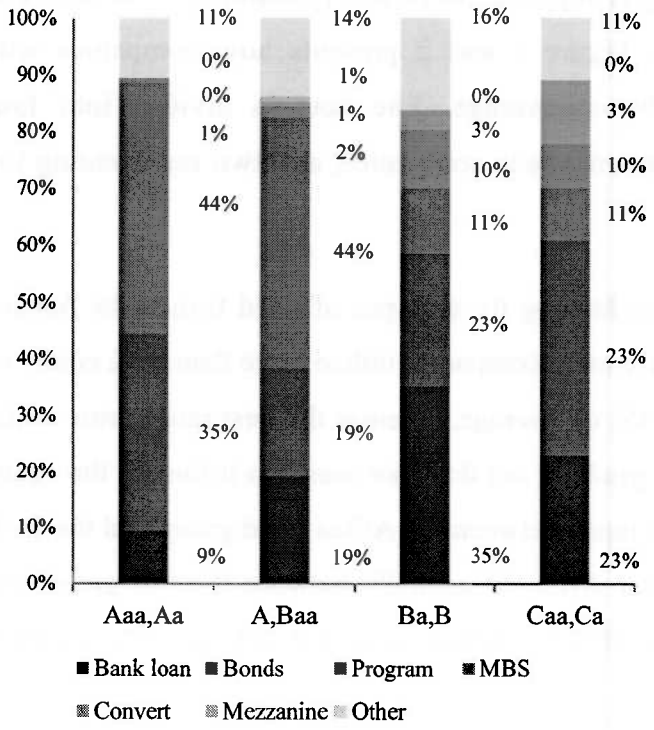

FIGURE 3 – DEBT UTILIZATION BY RATING

Figure 3 presents the average fraction of debt utilization categorised by rating. The numbers are measured in percentage of total interest bearing debt.

Figure 3, illustrates that speculative grade firms on average utilize higher fractions of mortgage, convertible and mezzanine debt. These three debt categories thus look to be debt classes that are mostly used as other instruments gets unavailable or to expensive due to falling credit ratings, which is an assessment that supports the pecking order theory. Figure 3 also indicates that Aaa,Aa and A,Baa (investment grade companies) utilize an equal amount of program debt. A,Baa companies, however, utilizes a higher portion of bank debt (19% compared to 9% of total interest bearing debt debt), while Aaa,Aa firms utilizes a higher portion of bonds (35% to 19% of interest bearing debt). The trend continues if we look at Ba/B rated firms. They utilize the highest fraction of bank debt of all the four categories, equalling 35% of total debt. Ba/B companies compensate by having a low utilization of program debt, which is totalling 11% of total debt. This is in some extent in line with Rauh and Sufi's (2010) findings. They, however, did not derive a negative relationship between credit quality and bank loan utilization, but between profitability and bank loan utilization which is an important factor in credit rating, as a rating indicates a firms probability of default (in addition to loss given default) (Moody's, 2012b). The Caa/Ca rated firms main debt funding source is bonds, equalling 38%, whereas they have the highest utilization rate of convertible, totalling 11% of total debt.

4.1.1 Detailed debt split

When assessing whether different securities are secured, senior unsecured or subordinated and public or private, we divided the debt categories into several sub categories. Table 3 presents our findings in a more detailed manner than in table 1.

TABLE 3 - COMPOSITION AND PRIORITY OF TOTAL DEBT

The following table presents on a detailed level, how rated Nordic firms compose their debt structure. The amounts are in percentage of total interest bearing debt.

Detailed debt utilization split

Parameters	Average	Annual St.dev	Total St.dev	Total Max	Total Min
Bank Loans	0.284	0.034	0.293	1.000	0.000
Revolving	0.106	0.061	0.211	1.000	0.000
Term Loan	0.141	0.043	0.232	1.000	0.000
Unclassified	0.037	0.002	0.128	0.820	0.000
Bonds	0.202	0.040	0.250	0.975	0.000
Regular Bond	0.197	0.069	0.251	0.975	0.000
Revenue Bond	0.002	0.004	0.029	0.526	0.000
Unclassified	0.003	0.003	0.018	0.252	0.000
Program Debt	0.319	0.028	0.318	1.000	0.000
Commercial Paper	0.031	0.011	0.080	0.735	0.000
Medium-Term Note	0.281	0.035	0.306	1.000	0.000
Shelf-Registered Debt	0.002	0.003	0.019	0.220	0.000
Unclassified	0.005	0.003	0.025	0.267	0.000
Mortgage Debt	0.037	0.010	0.112	0.690	0.000
Convertibles	0.014	0.007	0.065	0.662	0.000
Mezzanine Debt	0.005	0.004	0.041	0.533	0.000
Other	0.140	0.018	0.165	0.815	0.000
Aquistion Notes	0.008	0.004	0.045	0.596	0.000
Capital Leases	0.030	0.004	0.095	0.809	0.000
Loans from others	0.004	0.002	0.029	0.254	0.000
Unclassified	0.097	0.020	0.145	0.810	0.000
Seniority					
Secured	0.106	0.027	0.236	1.000	0.000
Senior unsecured	0.699	0.037	0.297	1.000	0.000
Subordinated	0.032	0.013	0.096	0.533	0.000
Unclassified	0.153	0.025	0.193	0.842	0.000
Public/Private					
Public	0.387	0.033	0.317	1.000	0.000
Private	0.618	0.027	0.317	1.000	0.000

As seen from table 3 bank loans are relatively evenly spread between revolving and term loan. On average companies utilization of revolving debt equal 10.6% of totalled debt. Term loan utilization is somewhat higher at 14.1%. The high maximum observation of unclassified debt relates to a company that carries only an almost insignificantly portion of interest bearing debt, which we were unable to classify as term loan or revolving credit. Bonds and program debt is mainly focused around one particular subcategory. Out of a total bond

utilization rate at 20.2%, the average firm utilize regular bonds equalling 19.7% of total debt. Medium-term notes are the prominent type of program debt with a utilization rate of 28.1% of total debt. Other debt is based mainly on capital leases and unclassified debt.

Table 3 indicates that Nordic rated companies prefer to issue senior unsecured debt. On average 69.9% of a company's total debt is senior unsecured. 10.6% is secured debt and only 3.2% is subordinated. However, the maximum values show that there are companies relying 100% on just secured debt.

The bottom of table 3 present the spilt between public and private bonds. As shown in the table, 38.7% of all utilized debt is public, whereas 61.8% are private. This skewed distribution is mainly due to the fact that private debt includes all bank loans.

4.2 Regression modeling and univariate testing

In order to detect if there is a relationship between certain firm variables and debt structure we have used several types of multivariate regressions, univariate regression and testing.

We begin by presenting the results coming from our different tests and regression equations before we discuss them in light of each other, other empirical research and corporate finance theory at the end of this section. The first step is to present the basic relationship between firm variables and debt categories through a univatiate test called Mann-Whitney. The second step is to introduce linear regression models to describe the linear relationship between firm variables and debt classes one by one. Finally we conduct multivariate regression models including a variety of parameters in order to get a more comprehensive view on the contexts between firm variables and debt structure.

4.2.1 Findings

1. Univariate test

Because we have several observations equalling zero for each debt class, and the fact that utilization rates cannot take negative values, we recognise that our figures are not normally distributed. In order to get an initial overview over the coherence between firm values and different debt categories we have thus relied upon the non-parametrical Mann-Whitney test.

The Mann-Whitney test (Keller, 2005) simply assess whether there are significant differences between two groups. We have thus categorised each observation into one of two groups, either the high value group or the low value group based on each of our firm variables. The non-parametric Mann-Whitney does not assume any normal distribution, as it simply asses the rank sum of two different sample groups, and examines whether one is significantly larger than the other on the basis of a calculated U-statistic. This test is also known as Wilcoxons rank-sum test and follows the null and alternative hypothesis:

H_0: There are no differences between the rank sums of the high and low group groups

H_A: The rank sums of the high group are different from the low group

We do have a qualified opinion on which sample will have the highest value, but as there are done little or none previous research on this matter in Nordic countries we have nevertheless used two tailed tests in order to detect whether one group has higher or lower rank sums than the other.

Table 4 presents the results of the Mann-Whitney tests. There are 49 debt categories where the high group differs significantly from the low group. Several of the tests, does, however, have medians of zero for both groups, which is a result of many zero utilization observations and we have chosen to not put too much emphasis on these debt classes in the initial assessment. We will instead discuss these instruments further when computing regression models.

TABLE 4 – MANN WHITNEY RESULTS

The following figure presents the results of the Mann-Whitney tests. There are presented two figures per relationship. The upper figure represents the median of the upper group, whilst the lower figure represents the median of the lower group. The medians are figures in percentage of total debt. Figures marked with "" are significant at a 10% significance level, figures marked with "**" are significant at a 5% significance level, whereas figures marked with "***" are significant at a 1% significance level. All the other figures are not significant. Panel A presents the relationship between key ratios and debt types, whereas Panel B presents the relationship between key ratios and seniority and public/private. All the data, except the market to book and rating figures, are based on 370 observations. The rating variable is based on 274 observations and the market to book variable is based on 244 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	0.117	0.071	0.234	0.000	0.000	-	0.063***
	0.233	0.116	0.234	0.000	0.000	-	0.094***
Ln(Sales)	0.209	0.049**	0.439***	0.000**	0.000	-	0.104***
	0.165	0.133**	0.069***	0.000**	0.000	-	0.056***
Intangibility ratio	0.182**	0.004***	0.488***	0.000***	0.000	-	0.077
	0.213**	0.213***	0.073***	0.000***	0.000	-	0.077
Rating	0.216	0.232**	0.073***	0.000	0.000	-	0.138
	0.165	0.117**	0.429***	0.000	0.000	-	0.077
Net leverage rato	0.176	0.103	0.216	0.000	0.000	-	0.075
	0.219	0.079	0.290	0.000	0.000	-	0.080
Market to book	0.232*	0.000**	0.319	0.000	0.000	-	0.063***
	0.193*	0.094**	0.300	0.000	0.000	-	0.163***

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	0.000	0.829***	0.000	0.898	0.042
	0.000	0.720***	0.000	0.890	0.110
Ln(Sales)	0.000***	0.762	0.000***	0.918**	0.083
	0.001***	0.807	0.000***	0.838**	0.106
Intangibility ratio	0.000***	0.829	0.000	0.916	0.080
	0.001***	0.763	0.000	0.858	0.106
Rating	0.040***	0.560***	0.000***	0.775	0.225*
	0.000***	0.816***	0.000***	0.895	0.838*
Net leverage rato	0.000	0.763	0.000	0.700***	0.259***
	0.000	0.820	0.000	0.973***	0.000***
Market to book	0.000*	0.908***	0.000*	0.911	0.046
	0.000*	0.710***	0.000*	0.929	0.071

As seen from table 4 the high profit group of companies in our sample has a significantly higher utilization of other debt and senior unsecured debt. The utilization of other debt types does not differ significantly between the high and low profit groups.

Firm size has a significant impact on a firm's utilization of bonds, program and other debt, senior unsecured and private debt. Larger firms utilize a significantly smaller portion of bonds and a larger fraction of program debt than smaller firms, the medians being 0.049 and 0.439 for the largest firms and 0.133 and 0.069 for the smaller firms, respectively. In addition large firms utilize a significantly larger fraction of other debt than smaller firms.

Firms with high intangible asset ratios utilize significantly less bank debt and bonds, and more program debt than firms with little intangible assets, the medians being 0.182, 0.004 and 0.488 respectively for the group with the highest intangibility ratio, and 0.213, 0.213 and 0.073 for the group with the lowest intangibility ratio. Highly intangible firms, on the other hand, utilize significantly more secured debt, than low intangible firms.

Companies have been put into the high or low rating category on the basis if it is investment grade or speculative grade, the higher group being speculative group. Investment grade companies utilize significantly less bonds and more program debt than speculative grade firms, the medians being 0.232 and 0.073 for the speculative group and 0.177 and 0.429 for the investment grade group. Furthermore investment grade firms utilize significantly less secured debt, more senior unsecured debt and more private debt than speculative grade firms.

Highly levered firms utilize a significantly lower portion of public debt, and (consequently) a higher portion of private debt. Both of the relationships are highly significant.

There is a week significant relationship between market to book ratio amongst our sample firms and bank loan ratio. Firms with high market to book ratio utilizes a higher portion of bank debt than firms with a low market to book ratio. Additionally firms with high market to book value utilize less bonds and less other debt than low market to book firms, whereas they utilize significantly more senior unsecured debt and less public debt.

2. Univariate regression

As a starting point for our regression analysis we have computed several simple linear regressions to examine the relationships between firm variables and debt categories. The findings from these regressions are presented in table 5.

We have performed simple linear regressions between the seven categories of debt as the dependent variables, and the firm variables as the explanatory variable. This approach has been followed to examine whether basic overarching and stylized relationships are present in our dataset. In addition we have done simple linear regressions with seniority and whether the debt is private or public as explanatory variables. This exercise has also been carried out using moving average values of the firm variables. This, first of all, smoothens out observations for highly volatile variables. In addition, as debt investors and banks try to assess a firm's future cash flow, they are likely to pay attention to historical observations. Moving average variables could thus capture a context which a regression equation using updated annual variables might miss. All in all, 144 linear regressions have been conducted.

The number of observations used in the regressions should prove be sufficient in order to achieve statistical inference (Keller, 2005). However, we suspect the residuals from a linear regression to not be normally distributed, and we have clear indications of heteroscedasticity, as any linear relationship is bound to have several residuals on the down side of the regression line at the first part of the regression line due to a severe amount of zero observations. Because the zero observations pile up the residuals are rarely normally distributed. Bearing this in mind we assess the results of the univariate regression models with certain scepticism.

TABLE 5- UNIVARIATE REGRESSION RESULTS

The following table presents regression coefficient for our 72 single regressions. Panel A shows the relationship between firm variables and the seven main categories we have divided debt into. Panel B shows the relationship between a moving three year average of our firm variables and the seven main categories we have divided debt into. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the data, except the market to book and rating regressions, are based on 370 observations. The rating regressions are based on 274 observations and the market to book regressions are based on 244 observations.*

Panel A - Linear regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.030	-0.019	0.146**	-0.081***	-0.032**	0.004	0.012
	(0.061)	(0.052)	(0.065)	(0.023)	(0.013)	(0.008)	(0.034)
Ln(Sales)	-0.040***	-0.006	0.046***	-0.012***	-0.010***	-0.004***	-0.013***
	(0.007)	(0.006)	(0.008)	(0.003)	(0.002)	(0.002)	(0.005)
Intangibility ratio	0.051	-0.188***	0.241***	-0.061***	0.003	-0.010	-0.003
	(0.041)	(0.033)	(0.574)	(0.022)	(0.009)	(0.007)	(0.021)
Rating	0.048***	0.005	-0.062***	-0.003	-0.002	-0.016***	0.006
	(0.048)	(0.011)	(0.013)	(0.006)	(0.004)	(0.003)	(0.007)
Net leverage rato	-0.103***	0.072***	0.022	0.010	0.004	0.002	-0.009
	(0.026)	(0.022)	(0.028)	(0.010)	(0.006)	(0.004)	(0.015)
Market to book	-0.001	-0.007**	0.011***	0.001	0.000	-	-0.004**
	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	-	(0.002)

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Linear regression with moving average

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	0.263	-0.006	0.335**	0.036***	-0.007**	0.011	-0.055
	(0.109)	(0.092)	(0.122)	(0.043)	(0.019)	(0.018)	(0.060)
Ln(Sales)	-0.003	-0.002	0.046***	-0.008**	-0.011***	-0.006***	0.011**
	(0.008)	(0.007)	(0.008)	(0.003)	(0.002)	(0.002)	(0.004)
Intangibility ratio	-0.018	-0.072***	0.051	-0.031**	0.038	0.009	-0.036**
	(0.030)	(0.025)	(0.033)	(0.013)	(0.008)	(0.008)	(0.016)
Rating	0.062***	0.005	-0.077***	0.011	-0.001	-0.050	0.030***
	(0.012)	(0.014)	(0.017)	(0.008)	(0.005)	(0.004)	(0.008)
Net leverage rato	-0.100***	0.071***	0.018	0.006	0.007	0.000	0.009
	(0.031)	(0.026)	(0.035)	(0.014)	(0.008)	(0.008)	(0.018)
Market to book	0.001	-0.009**	0.020***	0.000	0.000	-	-0.006**
	(0.004)	(0.004)	(0.005)	(0.002)	(0.002)	-	(0.003)

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

According to table 5 panel A, profitability has a significant positive influence on a company's utilization of program debt, mortgage and convertible debt with coefficients equalling 0.335, 0.036 and -0.007 respectively. Moving average profitability, on the other hand, has a significant positive influence on the use of mortgage debt. The convertible and program debt relationships are, however, consistent with the normal regression.

Firm size has a significant relationship with all of the debt types except for bonds. All the significant coefficients explaining debt instruments are negatively correlated with firm size except program debt. The situation is rather similar for moving average firm size, with the exception that bank debt does not have a significant relationship as it had with normal firm size.

A firm's intangibility ratio is significantly influencing a firm's use of bonds, program and mortgage debt, with coefficients equalling -0.188, 0.241 and 0.061 respectively. This indicates that a firm on average reduce the utilization of bonds and mortgage debt, and increase the use of program debt, the higher intangible ratio the firm has. Moving average intangibility is coherent with the normal regression on the matter of bonds and program debt. The other coefficient, except other which yields a negative coefficient at 0.036, are not significant.

The level of credit rating in the linear model is highly significant with bank, program and mezzanine debt. Firms tend to issue less bank debt the higher the credit rating they have. The opposite is true for program and mezzanine debt. The relationship between program debt and rating is consistent with the relationship between profitability and program debt, and suggests that firms tend to utilize more program debt the higher rating the company has. Companies' moving average rating has several similarities with the normal regression. The relationship between rating and bonds, program, secured and senior unsecured debt is equal to the equivalent for the normal regression model. The moving average model shows, in addition, a positive significant relationship between rating and other debt.

There is a highly significant relationship between net leverage ratio, bank loans and bonds with coefficients, equalling -0.103, -0.007 respectively. Moving average net leverage ratio on the other hand is significantly influencing bank debt and bonds with the coefficients of -0.100 and 0.071.

Market to book has a significant relationship with bonds, with a negative coefficient of -0.007 and positive influence on program debt with a coefficient equalling 0.011. The moving average regression model has a similar relationship.

Table 5 presents the relationship between the normal and moving average regression model and debt seniority and whether debt is public or private. By examining this table we find that profitability has a significantly relationship with secured and senior unsecured debt on a normal and a moving average basis. Firm size is the parameter influencing the most categories. Secured, senior unsecured and public and private debt utilization has a relationship with firm size that is significant at a 1% significance level. Secured and private debt is influenced negatively by firm size, whereas senior unsecure, subordinate and public bonds are influenced positive coefficients of 0.047, 0.064 and 0.102 respectively. Firm size at a moving average has a relationship with senior unsecured debt which is negative at a 1% significant level, the coefficient being -0,025. The other coefficient is consistent with the normal regression.

There are significant relationships between intangibility ratio and secured, subordinated and public bonds. The higher the intangibility ratio is, the more subordinated and public debt is utilized. The relationship is the opposite for secured debt. Higher intangibility ratio tends to lower the use of secured instruments. A firm's moving average intangibly has a negative influence on a firm's utilization of bonds, mortgage and other, the coefficients being -0,072, -0,031 and 0,036 respectively.

An increase in normal credit rating[10] yields an increase in secured and private debt, and a reduction in senior unsecured debt and subordinated debt, with coefficients at 0.031, -0.030, -0.011 and 0.016 respectively. Moving average rating have similar coefficients, however, the moving average influences the senior unsecured level positively at a significance level of 5%.

The leverage ratio and market to book ratio, both normal and the moving average have significant coefficients for public and private debt. Public debt utilization decreases with growth in leverage or market to book, whereas private debt utilization decreases.

[10] An increasing in credit rating in this situation implies a downgrade by Moody's as we measure Aaa as 1 and C as 9.

TABLE 6 – UNIVARIATE REGRESSION RESULTS

The following table presents regression coefficient for our 72 single regressions. Panel A shows the relationship between firm variables and seniority, as well as between firm variables and public and private debt. Panel B shows the relationship between the moving three year average of firm variables and seniority, as well as between firm variables and public and private debt. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the data, except the market to book and rating regressions, are based on 370 observations. The rating regressions are based on 274 observations and the market to book regressions are based on 244 observations.*

Panel A - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.121**	0.154**	0.001	-0.125	0.194
	(0.048)	(0.061)	(0.020)	(0.137)	(0.161)
Ln(Sales)	-0.064***	0.047***	0.007**	0.102***	-0.029***
	(0.005)	(0.008)	(0.003)	(0.010)	(0.011)
Intangibility ratio	-0.073**	0.017	0.064***	0.187**	-0.085
	(0.033)	(0.042)	(0.015)	(0.073)	(0.066)
Rating	0.031***	-0.030**	-0.011**	0.007	0.016***
	(0.009)	(0.013)	-(0.011)	(0.018)	(0.064)
Net leverage rato	-0.011	0.022	-0.009	-0.386***	0.329***
	(0.021)	(0.031)	(0.009)	(0.064)	(0.059)
Market to book	0.001	0.004	-0.001	-0.060**	0.032
	(0.003)	(0.004)	(0.001)	(0.026)	(0.032)

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.195**	0.662**	-0.008	-0.250	0.103
	(0.087)	(0.110)	(0.039)	(0.228)	(0.221)
Ln(Sales)	-0.025***	-0.025***	0.006*	0.102***	0.025**
	(0.006)	(0.006)	(0.003)	(0.010)	(0.011)
Intangibility ratio	-0.014	-0.114***	0.020*	-0.117***	-0.081**
	(0.024)	(0.031)	(0.012)	(0.044)	(0.041)
Rating	0.049***	0.036**	-0.009	-0.004	0.048**
	(0.011)	(0.017)	(0.007)	(0.023)	(0.021)
Net leverage rato	-0.007	0.027	0.014	-0.336***	0.368***
	(0.025)	(0.034)	(0.012)	(0.077)	(0.070)
Market to book	0.002	0.013**	-0.002	-0.041*	0.102***
	(0.003)	(0.005)	(0.002)	(0.023)	(0.018)

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

3. Multivariate regressions

In order to further investigate the relationship between firm variables and debt categories we have constructed several multivariate regression models. These models are our main findings as they take several aspects into account simultaneously and thus enable us to assess the relative importance of the different key variables. Using a multiple regression we can for instance include both profitability and tangibility as explanatory variables simultaneously and then take into account that a firm can have high profit combined with different levels of tangibility.

We will start by presenting a multivariate regression including profitability, firm size, intangibility of assets, and whether the specific observation is from a listed and/or a rated company. We will continue by including dummy variables to our regression equation for which year the observation has taken place. The following regression equation will include dummy variables which identifies which type of industry the specific observation comes from, before we include dummy variables for which country the observation belongs to and whether the observation originates from the year of the the financial crisis. We will finish of the multivariate section by presenting multivariate regressions where we have substituted profitability, firm size and intangibility with rating, a regression where we have substituted listing with market to book values, and a regression model that splits profitability into two variables.

Initial multivariate regression

Our first regression consists of the parameters profitability, firm size, intangible asset ratio and whether the observations come from a listed and/or rated company. This provides the following regression equation;

$$Debt_y = \beta_0 + \beta_1(EBIT/Sales) + \beta_2\big(Ln(Sales)\big) + \beta_3(Intangibile\ asset\ ratio) + \beta_3(Dummy\ variable\ for\ listined) + \beta_4(Dummy\ variable\ for\ rated) + \varepsilon_i$$

The first of the three variables are included in the regression on the basis of the empirical research conducted by Rauh & Sufi (2010), Lasfer (1999) and Barclay and Smith (1995). The latter two variables, listing and rating, gives our thesis a dimension that is not included in Rauh and Sufi (2010), Lasfer (1999) and Barclay and Smith (1995), namely that listed companies should tend to have a lower asymmetric information level than non-listed companies because of regulatory requirements that must be met for companies listed on a

stock exchange. Rated companies, on the other hand, has been proved to have an easier access to market debt (Fulkender & Petersen, 2006) and including these two variables gives us an opportunity to examine the effects these aspects have on debt structure.

We have not included rating and leverage ratio into our regression model. This is because of multicollinearity. Rating reflects a company's probability of default and loss given default (Moody's, 2012), two aspects closely related to profitability and intangibility ratio (Weiss, 1990, Johnsen, 2011a, p.12). Leverage ratio, on the other hand, is claimed, by Rauh and Sufi (2010) to have a highly correlated relationship with tangibility of assets.

Market to book is not included in order to not discard too many observations. Our sample consists of 246 observations if we only include listed companies, compared to 370 observations in total. We have thus decided to do the market to book assessment in a supplementing regression in the end.

TABLE 7 - MULTIVARIATE REGRESSION MODEL

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against five firm variables, including two dummies, defining the properties of the sample companies. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the firm variables and each of the seven debt categories. Panel B shows the relationship between the firm variables and seniority, and between firm variables and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.087***	0.219***	0.031	-0.026***	-0.016***	0.003	0.005
	(0.019)	(0.065)	(0.020)	(0.007)	(0.004)	(0.003)	(0.010)
Ln(Sales)	-0.024***	-0.039**	0.034***	-0.009***	-0.012***	0.003	0.020***
	(0.009)	(0.016)	(0.010)	(0.004)	(0.002)	(0.001)	(0.005)
Intangibility ratio	0.041***	-0.001	0.245***	-0.048**	0.018***	-0.006	-0.081***
	(0.041)	(0.008)	(0.044)	(0.016)	(0.010)	(0.006)	(0.022)
Listed	-0.034	-0.172***	-0.04883	-0.017***	0.013*	-0.018	0.074***
	(0.033)	(0.036)	(0.036)	(0.014)	(0.008)	(0.005)	(0.018)
Rated	-0.221	0.010	0.178***	0.005	0.014	0.005	-0.020
	(0.033)	(0.029)	(0.035)	(0.013)	(0.008)	(0.005)	(0.017)
Constant	0.665***	0.051*	-0.139*	0.144	0.093*	-0.007	-0.040
	(0.074)	(0.029)	(0.080)	(0.030)	(0.017)	(0.011)	(0.039)
R2 adj.	0.153	0.085	0.162	0.078	0.081	0.038	0.122

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.070***	-0.065***	0.027***	0.022	-0.128***
	(0.015)	(0.020)	(0.006)	(0.020)	(0.020)
Ln(Sales)	-0.045***	0.024**	0.021***	0.041***	-0.033***
	(0.007)	(0.010)	(0.003)	(0.010)	(0.010)
Intangibility ratio	0.009	-0.029	0.060***	0.092**	-0.096***
	(0.033)	(0.043)	(0.012)	(0.045)	(0.045)
Listed	-0.024	-0.023	-0.081***	-0.039	0.024
	(0.026)	(0.035)	(0.010)	(0.036)	(0.036)
Rated	0.001	0.043	0.039***	0.213***	-0.207***
	(0.026)	(0.034)	(0.010)	(0.035)	(0.036)
Constant	0.498	0.513***	-0.134***	-0.115***	1.065***
	(0.059)	(0.078)	(0.022)	(0.081)	(0.082)
R2 adj.	0.121	0.088	0.253	0.149	0.175

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

From table 7, panel A, we can examine what impact our parameters have on the fraction of certain utilized debt instrument classes. The regressions indicate that profitability has a highly significant negative relationship with bank loans, mortgage debt and convertible bonds. The coefficient is, however, substantially larger in magnitude for bank loans than for mortgage and convertible bonds, 0.087 versus 0.026 and 0.016, respectively. The regression, furthermore, claims there to be a highly significant positive relationship between profitability and bonds, with a positive coefficient of 0.29. The other debt instruments do not have any significant relationship with profitability according to our initial multivariate regression.

Firm size, as seen in panel A, significantly influences the utilization rate of all our debt instrument classes, except mezzanine. Bank loans, bonds, mortgage and convertible debt is negatively influenced by firm size. Firm size has the largest coefficients towards bonds and banks in magnitude, 0.039 and 0.024, respectively. Firm's size impact on mortgage and convertible is lower, with coefficients at -0.009 and -0.0012. This is natural given the fact that the average utilization for bank and bonds is much higher than for mortgage and convertible (table 7). Program and other debt are positively influenced by firm size, with highly significant coefficients equalling 0.034 and 0.02 respectively.

The intangible ratio has a highly significant influence on bank loans, program debt and convertibles. The respective coefficients are 0.041, 0.245 and 0.018, thus program debt is, by far, the most influenced debt instrument class. Mortgage and other are negatively influenced by intangibility, with negative coefficients equalling -0.048 and -0.081.

Whether a company is listed influences the utilization level of bonds, mortgage, convertible and other. The coefficients are all significant at a level below 1%, except convertible which only is significant at 10%. Bonds and mortgage are negatively influenced by company listing, with coefficients equalling -0.178 and -0.017 respectively. Convertible bonds and other debt are significantly positive influenced by company listing, with coefficients equalling 0.013 and 0.074 respectively. Companies that are rated tends to, according to this multivariate model, increase their utilization fraction of program debt, which is significant with a 0.178 positive coefficient.

From table 7 panel B we see the impact different parameters have on debt seniority and whether debt is public or private. Profitability has a highly significant influence on a company's fraction of utilized secured, senior unsecured, subordinated and private debt.

Secured, senior unsecured and private debt are influenced negatively with the respecting coefficients of -0.07, -0.065, -0.128. The fraction of utilized subordinated bonds, on the other hand, increases with profitability with a fraction of 0.027. All the relationships are significant at a 1% significant level.

Firm size has the same significant relationships with seniority and private debt as profitability. The difference is that senior unsecured debt is positively influenced by firm size on a 5% significance level. Public debt is, in addition, highly influenced by firm size. The coefficient is 0.041 and significant at a 1% level.

Intangibility ratio is highly significant towards secured, subordinated, public and private debt. All the relationships are highly significant. The coefficients, however, differs somewhat in magnitude. Subordinated debt has a higher coefficient than secured, respectively 0.06 and 0.009. Private debt is positively influenced with a coefficient of -0.096 whereas public debt is influenced with a coefficient of 0.092.

Listing increases the fraction of utilized private debt with a coefficient of 0.024. Rating, on the other hand, has a significantly relationship with subordinated bonds, public and private debt, which are influenced by the coefficient 0.039, 0.213 and -0.207, respectively. All coefficients are significant at a 1% level.

Multivariate regression with year variables

Our second regression model includes dummy variables indicating which year a specific observation originates from. As presented in the summary statistics, there seems to be certain trends in the data sample. By including a year specific variable we should be able to eliminate this effect form the firm value coefficients. The regression equation is thus expanded to;

$$Debt_y = \beta_0 + \beta_{x_1}(Firm\ Variables) + \beta_{x_2}(Year\ of\ Observation) + \varepsilon_i$$

In addition to philtre out year specifics from the firm variable coefficients, the year dummies are interesting by themselves, as they may reveal if there are any significant utilization trends amongst the different years, and describe these trends through coefficients.

We have not included a dummy for 2001 in order to avoid the dummy trap. The constant in the regression model thus reflect 2001, and the dummy variable coefficients are thus an expression of the difference between the dummy year and base year, 2001.

The results from this regression model, presented in table 8, are rather similar to table 7. There are however, a few discrepancies which we will comment on.

TABLE 8 - MULTIVARIATE REGRESSION MODEL WITH YEAR DUMMIES

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against five firm variables, including two dummies, defining the properties of the sample companies in addition to ten year dummies that identify what year the observation originate from. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the firm variables and each of the seven debt categories. Panel B shows the relationship between the firm variables and seniority, and between firm variables and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.089***	-0.034*	0.031	-0.030***	-0.017***	0.001	0.004
	(0.021)	(0.018)	(0.023)	(0.008)	(0.005)	(0.003)	(0.011)
Ln(Sales)	-0.025***	-0.001	0.034***	-0.009**	-0.012***	0.003	0.020***
	(0.009)	(0.008)	(0.010)	(0.004)	(0.002)	(0.001)	(0.005)
Intangibility ratio	0.025	-0.161***	0.244***	-0.046***	0.017*	-0.006**	-0.079***
	(0.041)	(0.036)	(0.045)	(0.017)	(0.010)	(0.006)	(0.022)
Listed	-0.024	0.008	-0.045	-0.019	0.013	-0.019	0.074***
	(0.034)	(0.030)	(0.037)	(0.014)	(0.008)	(0.005)	(0.018)
Rated	-0.245***	0.067**	0.176***	0.009	0.014*	0.005	-0.015
	(0.033)	(0.029)	(0.037)	(0.014)	(0.008)	(0.005)	(0.018)
Constant	0.716***	0.236***	-0.127	0.108***	0.089***	-0.015	-0.044
	(0.101)	(0.089)	(0.111)	(0.041)	(0.024)	(0.015)	(0.054)
R2 adj.	0.163	0.089	0.142	0.063	0.070	0.024	0.107

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.084***	-0.046**	-0.011	0.028	-0.131***
	(0.017)	(0.022)	(0.009)	(0.023)	(0.023)
Ln(Sales)	-0.045***	0.021**	0.062***	0.040***	-0.032***
	(0.007)	(0.010)	(0.010)	(0.010)	(0.010)
Intangibility ratio	0.006	-0.026	-0.020**	0.100**	-0.105**
	(0.033)	(0.044)	(0.010)	(0.046)	(0.046)
Listed	-0.023	-0.013	-0.067***	-0.039	0.030
	(0.027)	(0.036)	(0.011)	(0.038)	(0.038)
Rated	-0.003	0.049	0.040***	0.223***	-0.219***
	(0.027)	(0.035)	(0.011)	(0.037)	(0.038)
Constant	0.422***	0.648***	0.026	-0.039	1.011***
	(0.081)	(0.107)	(0.025)	(0.112)	(0.113)
R2 adj.	0.107	0.080	0.156	0.137	0.165

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

As seen from table 8, the relationship between profitability and bonds has changes from positive to negative. The coefficient in the latter regression model is only significant on a 10% significance level, compared to 1% in the initial model.

Including year dummies makes firm size's influence on bonds and other debt not significant. The other relationships are equal or close to equal. Intangibility ratio turns not significant towards bank loan influence when the year dummies are included. Mezzanine, however, becomes significantly negatively influenced on a 5% significance level.

A listed company has, according to the regression model including year dummies, only a significant impact on other debt. Rating, however, significantly influence the fraction of utilized bank loans, bonds, program and convertible. All but bank loans are influenced positively. Bank loans and program have the largest coefficients, -0.245 and 0.176 respectively. Both the coefficients are significant at a 1% significance level. In contrast bonds and convertibles are significant at respectively 5% and 10% with coefficient values equalling 0.07 and 0.014.

Table 8 panel B does, as panel A, have several similarities to table 7. Profitability has, however, not any longer a significant relationship with subordinated debt. Intangibility's influence on subordinated bonds turns negative once year dummies are included. Subordinated bonds are influenced with a coefficient equalling -0.02, which is significant at a 5% level.

The coefficients for the year variables are presented in the appendix. Using this multivariate regression model, only the fraction of utilized senior unsecured debt is significantly influenced by which year the observation originates from. As seen in table 8 the years of 2009, 2008, 2007, 2006, 2005 and 2002 significantly lowers the fraction of utilized senior unsecured debt compared to the base year of 2001.

Even if the year effects are not significant at a 10% level, they do tell a story. As we can see from appendix 8.5, the large fluctuations in bank loans and bonds, as described in the summary statistics, are not caught by the firm variable coefficients. We cannot claim this fluctuation to be due to year specifics, as these variables are not significant, however, they do give an indication, and we will assess this further after we have included even more variables to the model.

Multivariate regression with year and industry specific dummies

The previous model did not reveal any significant relationship amongst year variables and debt classes. We do not want to discard the year effect without further testing and we thus keep the year dummies in the next regression model. The third multivariate regression model includes dummy variables indicating which industry the specific observation originates from, in addition to whether the observation originates from the year of the financial crises, defined as the years 2008, 2009 and 2010. The financial crisis seems to have a vast impact on the debt utilization when assessing figure 1 in the summary statistics. We have in addition wanted to philtre out eventual industry specifics in order to isolate firm variable effect even more. The regression equation is thus expanded to;

$$Debt_y = \beta_0 + \beta_{x_1}(Firm\ Variables) + \beta_{x_2}(Year\ of\ Observation) + \beta_{x_3}(Industry) + \beta_{x_4}(Financial\ Crisis) + \varepsilon_i$$

Industry dummies are included in order to philtre out year specific industry trends from the parameter coefficients. The industry dummies are, however, also interesting in themselves, as they may reveal if there are any significant structural trends amongst the different industries.

In order to divide our sample firms in different industries we have organized them by their initial letter in the NACE code register, explained in section 3.5. Our sample consists of 8 different industry categories. To avoid the dummy trap we have excluded the other category. The constant reflects the industry categorised by us as "other". This category includes conglomerate that operates over a wide spectre of businesses and thus is unclassifiable. This category is suitable to exclude because it's reasonable to believe that it represents the widest spectre of industries of all the NACE codes. The dummy variable coefficients thus express the difference between the broad category called other and specific industry niches.

TABLE 9 - MULTIVARIATE REGRESSION WITH YEAR, INDUSTRY AND FINANCIAL CRISIS DUMMIES

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against five firm variables, including two dummies, defining the properties of the sample companies in addition to ten year dummies that identify what year the observation originate from, 8 NACE dummies indicating industry and a dummy variable indicating if the observation originates from the financial crises. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the firm variables and each of the seven debt categories. Panel B shows the relationship between the firm variables and seniority, and between firm variables and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.079***	-0.031*	-0.002	-0.030***	-0.001	0.004	0.004
	(0.022)	(0.017)	(0.021)	(0.007)	(0.005)	(0.003)	(0.011)
Ln(Sales)	-0.010	-0.008	0.035***	-0.016***	-0.006	0.004	0.014**
	(0.011)	(0.009)	(0.011)	(0.004)	(0.002)	(0.002)	(0.006)
Intangibility ratio	0.025	-0.061	0.157***	-0.061***	-0.004	-0.002	-0.044
	(0.052)	(0.043)	(0.052)	(0.018)	(0.012)	(0.008)	(0.028)
Listed	-0.040	-0.109***	0.063	-0.019	0.011	-0.010	0.102***
	(0.045)	(0.037)	(0.044)	(0.015)	(0.010)	(0.007)	(0.023)
Rated	-0.216***	0.128***	0.084**	0.018	0.019	0.003	-0.026
	(0.034)	(0.028)	(0.034)	(0.012)	(0.008)	(0.005)	(0.018)
Financial Crisis	-0.070	-0.114**	0.120**	0.029	-0.061***	-0.017	0.102***
	(0.057)	(0.046)	(0.056)	(0.019)	(0.013)	(0.009)	(0.030)
Constant	0.704***	0.184	-0.367***	0.420***	0.031	-0.032	-0.028
	(0.131)	(0.107)	(0.129)	(0.045)	(0.029)	(0.020)	(0.069)
R2 adj.	0.201	0.244	0.341	0.361	0.205	0.054	0.195

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.028**	-0.108***	0.024***	0.01911	-0.150***
	(0.014)	(0.022)	(0.006)	(0.030)	(0.029)
Ln(Sales)	0.000	-0.020*	0.033***	0.076***	-0.071***
	(0.007)	(0.011)	(0.003)	(0.015)	(0.014)
Intangibility ratio	0.001	-0.013	0.067***	-0.07349	0.09123
	(0.034)	(0.052)	(0.014)	(0.070)	(0.069)
Listed	-0.091***	-0.002	-0.063***	-0.213***	0.209***
	(0.029)	(0.044)	(0.012)	(0.054)	(0.054)
Rated	0.039	0.027	0.033***	0.102**	-0.092*
	(0.023)	(0.034)	(0.009)	(0.048)	(0.047)
Financial Crisis	-0.031	0.016	0.021	-0.00792	0.00309
	(0.037)	(0.056)	(0.016)	(0.068)	(0.067)
Constant	0.240***	0.862***	-0.327***	-0.649***	1.628***
	(0.086)	(0.130)	(0.036)	(0.162)	(0.161)
R2 adj.	0.437	0.227	0.416	0.348	0.401

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

As presented in table 9, the multivariate regression including industry and financial crises dummies, have several similarities with the regression model with only year dummies. There are, however, some discrepancies amongst the models.

Firstly, the influence from profitability on convertible turns not significant when industries and financial crises are included. Secondly, the coefficient describing the relationship between firm size and bank loans are no longer significant in the latter model. Thirdly, the significance of the coefficient describing mortgage increases when the model is expanded. The value of the coefficient also increases slightly. For the fourth, intangibility rate loses its significant influence on bonds, mezzanine and other.

Listed companies has a significantly lower fraction of bonds than companies that are not listed, on the contrary to the previous regression model where listing only had a significant influence on other debt. There are no changes in the listing coefficients that are significant towards debt instruments. However, the value of the coefficients has change somewhat. The program debt coefficient declines from 0.176 to 0.084, whereas the bonds coefficient increases from 0.128 to 0.067.

The financial crisis has a significant relationship towards bonds, program, convertible and other debt. The influence on bonds and convertible are negative, the coefficient have the respective values of -0.114 and -0.061. Program debt and other has a positive relationship with the financial crises, 0.120 and 0.102 respectively. Even if not significant, the coefficient explaining the relationship between the financial crisis and bank debt indicates what was expected looking at figure 1 in the summary statistic. Bank debt grew substantially in the two year prior to the crisis, before it declined through the crisis. The coefficient indicates a negative relationship at -0.07.

There are several significant industry dummies (see 8.6). NACE group D, H, J and N, which are indicators for electricity and gas industry, transportation industry, information & communication industry and administrative services, respectively, utilizes a significantly smaller fraction of bank debt then the base NACE group, with coefficients ranging from -0.122 to -0.266. Bonds on the other hand are utilized significantly more by NACE C and G, which are indicators for manufacturing industry and wholesale & retail industry, with coefficient values at 0.257 and 0.104 respectively. Program debt is significantly higher utilized by the wholesale, transportation, information & communication and administrative

industry, then by the base group, with coefficients of 0.230, 0.423, 0.454 and 0.258. As for mortgage, all the industries utilize a lower fraction than the other group. This thus indicates that the group containing other are biased towards mortgage loans.

From panel B we can see that the relationship between utilized subordinated bonds and firm variables increase significantly when industry variables are included. Firm size is no longer significant, as the coefficient is increased to zero. Listing, on the other hand, has turned significant with a coefficient at -0.091. The other coefficients remain close to constant.

The coefficient describing the relationship between firm size and the fraction of utilized secured debt turns significant when industry variables are included. The coefficient describes a negative impact on the fraction of secured debt when firm size increases.

Intangibility loses its relative importance when industry variables are included. Only the influence on subordinated bonds says significant. The coefficient, however, turns from -0.02 to 0.067.

Several coefficients for listing turn significant when industry variables are included. The fraction of utilized secured debt is reduced significantly once a company gets listed. Simultaneously public debt utilization decreases whereas the private debt utilization increases.

The rating coefficients do not change particularly in value when industry variables are included. The significant level, however, changes somewhat. The relationship between whether a company is rated and the fraction of utilized public debt is significant at a 5% level once industry variables are included, compared to 1% pre industry variables. The rating/private coefficient turns even less significant, and is significant at a 10% level once industry is included.

Several of the industry variables are highly significant, as seen in appendix 8.6. The mining and quarrying industry utilizes a higher fraction of secured debt than the basis group, having a coefficient of 0.481. All the other coefficients, except the wholesale and retail industry, however, have a significantly more negative influence on secured utilization the basis group, whereas the electricity & gas industry and the administrative services have the most negative coefficients, being -0.245 and -0.237 respectively. The mining and quarry industry have a significant negative impact on the fraction of utilized senior unsecured debt, the coefficient

being -0.495. The information & communication industry, on the other hand, utilizes significantly more senior unsecured debt, however in much smaller magnitude than the mining & quarrying industry with a coefficient being 0.143. The mining & quarrying, electricity & gas, wholesale and transportation industries utilize a significantly higher fraction of subordinated bonds than the base category, with coefficients ranging from 0.08 to 0.212. The public coefficients are significant for all the different industries except for administrative services. Most of the coefficients have large values, the information & communication industry for instance has a coefficient of 0.801.

Only the year variables describing the utilization of mezzanine debt are significant. As seen in appendix 8.6, however, the fluctuation of the coefficients going from year to year seems to indicate what we assessed from the statistical summary, figure 1, that there are certain trends.

Multivariate regression with year, industry specifics and nation variable

The third regression equation showed no or little significance for the year variables. However, we still believe there to be coherence between the year of the observation and utilization level, and we thus keep the dummy variables representing observation year when we expand our regression model even further. The statistical summary seems to reveal that there are differences amongst the average debt structures amongst the Nordic countries. To remove this effect from the other variables we introduce dummy variables that indicate the origination country of the observation. The regression equation is thus expanded to;

$$Debt_y = \beta_0 + \beta_{x_1}(Firm\ Variables) + \beta_{x_2}(Year\ of\ Observation) + \beta_{x_3}(Industry) + \beta_{x_4}(Financial\ Crisis) + \beta_{x_5}(Country) + \varepsilon_i$$

Country dummies are included in order to philtre out national trends from the firm variable coefficients. The country dummies are, in addition, interesting in themselves, as they may reveal if there are any significant utilization trends amongst the different Nordic countries.

To avoid the dummy variable trap we have excluded Norway from the country variables. Thus we use Norway as the base country, and all the other country dummy variables are measured according to Norway.

TABLE 10 – COMPLETE MULTIVARIATE REGRESSION MODEL

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against five firm variables, including two dummies, defining the properties of the sample companies in addition to ten year dummies that identify what year the observation originate from, 8 NACE dummies indicating industry, a dummy variable indicating if the observation originates from the financial crises and dummies indicating country. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the parameters and each of the seven debt categories. Panel B shows the relationship between the parameters and seniority, and between parameter and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.060***	-0.064***	0.007	-0.026***	0.001	0.003	0.011
	(0.022)	(0.017)	(0.022)	(0.006)	(0.005)	(0.003)	(0.012)
Ln(Sales)	0.005	-0.018*	0.043***	-0.028***	-0.006*	0.000	0.019***
	(0.012)	(0.010)	(0.012)	(0.004)	(0.003)	(0.002)	(0.007)
Intangibility ratio	-0.031	0.002	0.187***	-0.093***	-0.005	-0.009	-0.048*
	(0.051)	(0.041)	(0.051)	(0.015)	(0.012)	(0.008)	(0.028)
Listed	-0.033	-0.123***	0.043	0.02	0.008	-0.004	0.095***
	(0.045)	(0.036)	(0.045)	(0.013)	(0.010)	(0.007)	(0.025)
Rated	-0.202***	0.089***	0.080**	0.037***	0.023***	0.007	-0.022
	(0.033)	(0.027)	(0.033)	(0.010)	(0.008)	(0.005)	(0.018)
Financial Crisis	-0.094*	-0.088**	0.092*	0.058***	-0.064***	-0.009	0.088***
	(0.055)	(0.045)	(0.055)	(0.016)	(0.013)	(0.008)	(0.031)
Constant	0.520	0.390	-0.427***	0.502***	1.123***	-0.010	-0.097
	(0.143)	(0.117)	(0.143)	(0.043)	(0.033)	(0.021)	(0.080)
R2 adj.	0.291	0.339	0.401	0.58	0.233	0.186	0.197

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.026***	-0.112***	0.023***	-0.009	-0.096***
	(0.014)	(0.022)	(0.006)	(0.022)	(0.021)
Ln(Sales)	-0.012*	-0.005	0.029***	0.040***	-0.027**
	(0.008)	(0.012)	(0.003)	(0.012)	(0.012)
Intangibility ratio	-0.012	0.038	0.062***	0.101**	-0.097*
	(0.034)	(0.051)	(0.014)	(0.050)	(0.050)
Listed	-0.060	-0.029	-0.066***	-0.034	0.035
	(0.030)	(0.045)	(0.013)	(0.045)	(0.045)
Rated	0.051**	-0.005	0.039***	0.159***	-0.152***
	(0.023)	(0.034)	(0.009)	(0.033)	(0.033)
Financial Crisis	-0.004	-0.011	0.024	0.055	-0.068
	(0.038)	(0.056)	(0.016)	(0.055)	(0.055)
Constant	0.350**	0.843***	-0.335***	-0.102	1.007***
	(0.098)	(0.145)	(0.041)	(0.143)	(0.144)
R2 adj.	0.460	0.293	0.450	0.402	0.425

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Including nation variables alters the significance level of the coefficient explaining the relationship between profitability and bonds. The coefficient when the variable is included is significant at 1% significance level. The other coefficients are equal in terms of significance, and the values of the profitability coefficient are equal or close to equal to the regression model not including nation variables.

There are minor changes to the firm size coefficients when including nation variables. The value of the mortgage coefficient is increased in magnitude from -0.016 to -0.028, and the significance of the other coefficient is altered from 5% to 1%.

Intangibility ratio and listing are similar to firm size and the only alterations are minor changes in the coefficient values.

The number of significant rating and financial crisis coefficients increases when nation variables are included. As for the rating coefficients, mortgage debt turns significant on a 1% level. Financial crisis, on the other hand, has a significant influence on bank debt once nation variables are included. The other coefficients remain relatively unchanged.

The industry dummies remains quite similar to the model where nation variables are not included. The discrepancies are that the manufacturing dummy has a significantly influence on bond utilization in the latter model with a coefficient equalling -0.214. The information & communication industry and administrative services turn significant on the influence on program debt when nation variables are included with coefficients equalling 0.035 and 0.048 respectively.

The nation variable implementation increases the number of year dummies that have a significant impact on mortgage utilization (see appendix 8.7). Year 2010 and 2008 have a significantly lower fraction of mortgage debt than the base year with coefficients equalling -0.05 and -0.046 respectively

What country the security is issued in has a significant impact on the fraction of debt utilization according to our regression model. Denmark and Iceland utilizes a significantly higher fraction of bank loans than Norwegian firms, with coefficients equalling 0.258 and 0.333 respectively. Bonds on the other hand are utilized significantly less by Danish and Icelandic firms by the same coefficient factor in magnitude as the bank debt. Swedish firms do in addition utilize a significantly less fraction of bonds as well, with a coefficient value of

-0.156. As for program debt only Danish firms has a significantly different utilization rate from Norway, with a coefficient of -0.231. Mortgage debt, on the other hand is utilized significantly more in Sweden and Denmark with coefficients equalling 0.052 and 0.148 respectively, and significantly less in Iceland and Finland with coefficients of -0.075 and -0.045, respectively.

From panel B we can see that firm size influence the fraction of utilized senior unsecured debt turns not significant when nation variables are included. Intangibility ratio, on the other hand, turns significant in its relationship with public and private, with coefficients of 0.101 and -0.97 respectively. Whether a company is listed or not only has a significant influence on the fraction of utilized subordinated bonds. If a company is rated it has a significant impact on secured debt once nation variables are included.

Finnish companies have a significantly lower fraction of utilization of secured debt compared to Norway, whereas Swedish and Danish companies have significantly lower utilization of senior unsecured debt with coefficients equalling -0.141 and -0.285 respectively. As for public and private utilization fraction, all the companies have lower utilization of public bonds and higher private debt utilization.

Multivariate regression with rating

As stated in the beginning of section 3 under Findings, we have discarded the level of credit rating in the five previous models we have presented due to multicollinearity. Rating is still thought to have a great impact on debt structure, as indicated by figure 2 and 3 in the summary statistics, and we have thus computed a multivariate regression model using credit rating as the only firm variable. Rating ranges from Aaa to C, and we have incorporated this into the regression model by assigning each letter a number. Aaa is indicated by 1 and C is indicated by 9. Thus, an increasing value in the rating coefficient implies an worsening credit rating.We have decided to include all the other variables that have been included through the three previous equations. That is origination year, financial crisis, industry and country effect. The regression equation is thus;

$$Debt_y = \beta_0 + \beta_1(Credit\ Rating) + \beta_{x_2}(Year\ of\ Observation) + \beta_{x_3}(Industry) + \beta_{x_4}(Financial\ Crisis) + \beta_{x_5}(Country) + \varepsilon_i$$

TABLE 11 - MULTIVARIATE REGRESSION MODEL CREDIT RATING AND YEAR DUMMIES

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against credit rating, ten year dummies that identify what year the observation originate from, 8 NACE dummies indicating industry, a dummy variable indicating if the observation originates from the financial crises and dummies indicating country. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the parameters and each of the seven debt categories. Panel B shows the relationship between the parameters and seniority, and between parameter and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
Rating	0.058***	0.003	-0.041***	0.007	0.001	0.003	0.009
	(0.010)	(0.011)	(0.014)	(0.005)	(0.003)	(0.002)	(0.007)
Constant	0.102	0.13569	0.184	0.362***	-0.039	0.000	0.014
	(0.086)	(0.097)	(0.121)	(0.039)	(0.030)	(0.020)	(0.067)
Financial Crisis	0.027	-0.157***	-0.076	0.043**	-0.076***	-0.005	0.114***
	(0.046)	(0.052)	(0.065)	(0.021)	(0.016)	(0.011)	(0.036)
R2 adj.	0.420	0.351	0.394	0.555	0.310	0.257	0.099

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
Rating	0.024***	-0.019	0.012**	-0.007	0.052***
	(0.008)	(0.013)	(0.005)	(0.015)	(0.013)
Constant	0.293***	0.625***	-0.112***	0.188	0.522***
	(0.073)	(0.117)	(0.042)	(0.130)	(0.117)
Financial Crisis	0.022	-0.210***	0.051**	-0.111	-0.042
	(0.039)	(0.063)	(0.023)	(0.070)	(0.063)
R2 adj.	0.522	0.300	0.332	0.281	0.454

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

The regression model using rating as a firm variable yields several significant relationships. Rating has a negative influence on bank debt, as the coefficient is significant equalling 0.058 (Aaa is indicated as 1 and Cc is indicated as 8). Program debt is on the contrary negative correlated with debt, yielding a highly significant coefficient of -0.041. Rating also influences the utilization of secured, subordinated and private debt significantly, with coefficients totalling 0.024 and -0.012 and 0.052 respectively.

Financial crisis influences the level utilization of bonds and mortgage debt. Bonds have a highly negative coefficient at -0.157 and mortgage a significant coefficient at 0.043. Both convertible and other debt are also significantly influenced by the financial crisis according to the model, yielding highly significant coefficients equalling -0.076 and 0.114. The financial crisis is in addition significantly correlated to senior unsecured debt and subordinated bonds, having coefficients of -0.210 and 0.051, respectively.

Multivariate regression with growth opportunities

As including the market-to-book ratio in the multivariate regressions would have omitted a significant fraction of our sample, we chose to include a dummy variable for listing. However, we do not intend to preclude the market-to-book variable, as this is a good proxy to a firm's growth opportunities. We have thus constructed a regression model that includes the market-to-book ratio in addition to all the other firm variables and dummy variables used in the previous regression model.

As seen from table 12, this multivariate regression has a high R-squared, but the coefficients for market-to-book are not significant for any of the debt types or seniorities, except for program debt at a 5% significance level. Most of the other coefficients alter substantially when Market-to-Book is included in the model. We have chosen to not put too much emphasis on this model as the changes are due to the incorporation of a variable that barely show any significance.

TABLE 12 - MULTIVARIATE REGRESSION MODEL MARKET TO BOOK

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against five firm variables, including one dummies, defining the properties of the sample companies in addition to ten year dummies that identify what year the observation originate from, 8 NACE dummies indicating industry, a dummy variable indicating if the observation originates from the financial crises and dummies indicating country. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the parameters and each of the seven debt categories. Panel B shows the relationship between the parameters and seniority, and between parameter and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations.*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parameters	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	0.497***	-0.563***	-0.198	0.070*	0.036	-	0.157
	0.153	0.149	0.152	0.039	0.034	-	0.121
Ln(Sales)	-0.026	-0.023	0.037	-0.007	-0.005	-	0.024
	0.018	0.018	0.018	0.005	0.004	-	0.015
Market/Book	-0.001	-0.005	0.006**	0.000	-0.001	-	0.000
	0.003	0.003	0.003	0.001	0.001	-	0.003
Intangibility ratio	0.232***	-0.110**	-0.097*	-0.026*	0.024**	-	-0.024
	0.056	0.054	0.055	0.014	0.012	-	0.044
Rated	-0.133***	0.125***	0.003	0.030***	0.030***	-	-0.055
	0.036	0.035	0.036	0.009	0.008	-	0.029
Financial Crisis	-0.132**	-0.093	0.108**	0.032**	-0.043***	-	0.127
	0.059	0.058	0.059	0.015	0.013	-	0.047
Constant	0.877***	0.382*	-0.317	0.074	0.016	-	-0.033*
	0.222	0.215	0.220	0.056	0.049	-	0.175
R2 adj.	0.400	0.322	61.300	0.512	0.417	-	0.112

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Parameters	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	0.408***	-0.302*	-0.016	-0.369**	0.369**
	0.103	0.164	0.041	0.147	0.147
Ln(Sales)	0.057***	-0.137***	0.033***	-0.021	0.021
	0.012	0.020	0.005	0.018	0.018
Market/Book	-0.003	0.004	-0.001	0.000	0.000
	0.002	0.003	0.001	0.003	0.003
Intangibility ratio	0.007	-0.004	0.043***	-0.231***	0.231***
	0.037	0.059	0.015	0.053	0.053
Rated	0.016	0.085**	0.007	0.150***	-0.150***
	0.024	0.039	0.010	0.035	0.035
Financial Crisis	-0.010	-0.006	-0.004	-0.002	0.002
	0.040	0.063	0.016	0.057	0.057
Constant	-0.687***	2.380***	-0.363***	0.447**	0.553***
	0.148	0.237	0.059	0.213	0.213
R2 adj.	0.507	0.405	0.469	0.584	0.584

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Multivariate regression model with profitability split

Our final regression model examines if management of a firm reacts differently to changes in profitability depending on the profitability being positive or negative. This is an interesting angel on the determination of debt structure as a normal regression model only estimates one coefficient, which assumes there to be a constant relationship between the coefficient and the independent variable no matter how high or low the independent variable is. By dividing the variable into two different variables we can interpret the relative effect an increase in profitability have on debt utilization and examine if there are difference between highly profitable companies, and companies with negative profitability. We have chosen to use our initial regression model and increased this model with one variable through dividing profitability into two. The regression equation is thus:

$$Debt_y = \beta_0 + \beta_1(Positiv.Profit) + \beta_2(Abs.Negative.Profit) + \beta_3(Intangibile\ asset\ ratio) + \beta_3(Dummy\ variable\ for\ listined) + \beta_4(Dummy\ variable\ for\ rated) + \varepsilon_i$$

In the regression equation the Positiv.Profit variable takes the value of the profitability if this is positive, simultaneously as Abs.Negative.Profit takes the value of zero. If the profits, on the other hand, are negative, the variable Abs.Negative.Profit takes the absolute value of the profitability, simultaneously as Positiv.Profit takes the value of zero.

As seen from table 13 the two profitability variables tend to not be significant simultaneously. An increase in profitability when it is positive, yields a reduction in the utilization of bonds, other debt and private debt, whereas it increases the utilization of program and secure debt. A change in profitability, once it is negative reduces the utilization of senior unsecured debt, and increases the utilization of mortgage and secured debt. The two profitabilities are never simultaneously significant while they yield diverging coefficients.

TABLE 13 - MULTIVARIATE REGRESSION WITH PROFITABILITY SPLIT

The tables present coefficients from multivariate regressions where the seven categories of debt are used as dependent variables against six firm variables, including two dummies, defining the properties of the sample companies. The seven categories of debt are stated as a percentage of total interest bearing debt. Panel A show the relationship between the parameters and each of the seven debt categories. Panel B shows the relationship between the parameters and seniority, and between parameter and public or private bonds. Figures in brackets indicate standard error for the coefficients. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations*

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Variables	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
Pos.Profitability	0.105	-0.275**	0.331**	0.011	-0.035	-0.016	-0.121*
	0.073	0.063	0.076	0.048	0.029	0.019	0.067
Neg.Profitability	-0.011	-0.082	0.018	0.129***	0.019	-0.002	-0.070
	0.128	0.109	0.133	0.028	0.017	0.011	0.039
Ln(Sales)	-0.001	-0.015	0.028***	0.000	-0.008***	0.002	-0.006
	0.075	0.064	0.078	0.003	0.002	0.001	0.004
Intangibility ratio	0.047	-0.182***	0.249***	-0.046***	0.018	-0.007	-0.080***
	0.009	0.007	0.009	0.016	0.010	0.006	0.022
Listed	-0.064	0.014	-0.013	-0.023*	0.003	-0.018***	0.100***
	0.042	0.036	0.044	0.013	0.008	0.005	0.018
Rated	-0.217***	0.047	0.160***	0.012	0.020***	0.005	-0.027
	0.034	0.029	0.035	0.013	0.008	0.005	0.018
Constant	0.464***	0.379***	-0.140*	0.053*	0.059***	0.004	0.180***
	0.034	0.029	0.035	0.028	0.017	0.011	0.039
R2 adj.	0.109	0.097	0.170	0.100	0.053	0.034	0.108

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
Firm Variables	Secured	Sen.Unsec	Subordin.	Public	Private
Pos.Profitability	0.186*	0.019	-0.063	0.229*	-0.229*
	0.056	0.130	0.040	0.134	0.134
Neg.Profitability	0.147**	-0.126*	0.016	0.046	-0.046
	0.099	0.076	0.023	0.079	0.079
Ln(Sales)	-0.043***	0.037***	0.012***	0.038***	-0.038***
	0.058	0.009	0.003	0.009	0.009
Intangibility ratio	0.016	-0.030	0.052***	0.094	-0.094**
	0.007	0.043	0.013	0.044	0.044
Listed	-0.007	-0.047	-0.068***	-0.014	0.014
	0.033	0.035	0.011	0.036	0.036
Rated	-0.007	0.045	0.032***	0.202***	-0.202
	0.026	0.034	0.011	0.035	0.035
Constant	0.435***	0.404***	-0.053**	-0.123	1.123***
	0.026	0.074	0.023	0.077	0.077
R2 adj.	0.170	0.070	0.169	0.153	0.153

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

4.2.2 Discussion of findings

The significance of our results varies amongst the different firm variables and debt classes. In this section we will discuss each parameter, and interpret our findings in the context of established corporate debt structure theory. We have chosen to focus our discussion on relationships that are significant throughout the majority of our tests or observations that contradicts established theory and previous empirical evidence.

Profitability

We have assessed EBIT/sales as a proxy for profitability, as discussed in section 3.5.

Our first finding is that profitability has a highly significant negative influence on bank debt. This is consistent in all our regression models (except the one that includes market-to-book) as well as the Mann-Whitney test. This is contrary to the findings of Rauh and Sufi (2010), however, our findings thus seem to back the pecking order theory. The pecking order claims that firms which run out of internal funding will prefer to issue the least information sensitive type of capital. The rationale behind this theory is built on the lemon problem where, in the end, only poorly performing companies would issue equity (Akerlof, 1970). According to the pecking order theory, this yields a preference hierarchy where internal funding is the preferred funding then follows bank debt, market debt, hybrid securities and then equity (Frank & Goyal, 2007). Bank debt is superior to market debt due to the monitoring possibility of banks that reduces the lemon problem substantially (Berger & Udell, 1995). Our findings thus seem to support the pecking order theory as one should expect companies, once profitability is being reduced, to prefer to issue bank debt. Market debt will only be issued if, and when bank debt becomes unavailable. Companies whose profitability increases should also be expected to prioritise to repay bank debt as this enables the company to draw bank loans if the profitability worsens in the future.

Following the traditional rationale behind the pecking order we would expect our findings to claim there to be an increasingly positive relationship the more information sensitive the debt instrument is. Our regression model, is however, somewhat inconsistent with this rationale as bonds have a larger coefficients in magnitude than bank loans in two of our regression models, namely the multivariate regression model only emphasizing rating and the model including market-to-book. Both of the models claim there to be a positive relationship between profitability and bank debt. Bonds, on the other hand, have a negative

relationship. This is inconsistent with the traditional explanation of the pecking order, but it is consistent with the findings of Rauh and Sufi (2010). Rauh and Sufi (2010) barely comments on this in their study, but an argument why a positive coefficient may actually be in line with the pecking order is that the more profitable a company gets, the easier the access to bank loans will be. If we still assume that firms will prefer bank debt over other types of securities, one should anticipate seeing profitable companies retire market debt and relying increasingly on bank debt the more profitable the company gets. Measured as a fraction of total debt, this should then provide a positive linear relationship between profitability and bank debt. This is, however, as Rauh and Sufi (2010) comments, not the traditional interpretation of the pecking order, and is only supported by two of our models.

The coupons on mortgage debt and convertibles are lower than for other debt instrument due to the mortgage being secured and convertibles having a potential upside in addition to the bond yield (Fabozzi, 2005). Companies performing poorly thus have an advantage in issuing these types of securities. High coupons give profitable companies a tax shield which has a certain value. Taking the profitability out of the account, the tax effect disappears, and one should on this basis alone see that poorly performing companies tend to issue more mortgage and convertible debt than well performing companies. Our findings support this, especially the multivariate regression model with the profitability split, which indicates that when companies experience negative profitability they increase the utilization of mortgage debt.

The relationship between profitability and convertibles is in fact not significant in several of our tests; however, it is clearly negative in the tests where the coefficient is significant. Convertibles are a useful tool to avoid the lemon problem (Stein, 1992). If company that is already substantially levered opts for convertible debt financing, it will be perceived as relatively optimistic about future prospects for the share price. This is due to the fact that if the share price falls, the company will not be able to force conversion, and will be left with an even higher debt burden. Given the costs of financial distress associated with such a high level of debt, this is an undesirable outcome for the company. Consequently, the convertible bond issue should be met with a less negative perception than an equity issue of the same amount, and reduce the lemon problem (Stein, 1992). We would thus assume to see a negative relationship between convertibles and profitability, as convertibles, in theory only will be issued as a substitute to equity. As stated above there are, however, only a few of our models that support this view.

With regards to seniority, our regressions suggest a negative effect of profitability on secured debt, except for the market-to-book regression. Profitability is an integral part of a company's probability of default (Mjøs, 2012), and higher profitability should thus indicate a lower probability of default. Hence, a higher profitability will indicate a lower need for collateral. This is consistent with the relationship between profitability and mortgage explained above. Secured debt typically offers a lower yield to investors, and thus reduces the tax shields for profitable firms, making it more attractive to unprofitable firms.

Profitability show no clear relationship with public debt issues in our models. Private debt is generally negatively affected by profitability in our regressions. This is coherent with our findings regarding bank loans and profitability, and is consistent with the pecking order theory, because bank loans are private debt.

Firm size

As presented in section 3.5 we have used the natural logarithm of the firms' annual sales as a proxy for the firm size.

In the initial multivariate regression, firm size showed a significant negative relationship with the fraction of bank debt. This dependence was also evident in the simple linear regression, suggesting that the larger the company, the lower the utilization of bank debt. However, this relationship cannot be justified by looking at the remaining tests and regressions, as neither the Mann-Whitney test, nor the remaining regressions showed any significant relationships. Lasfer (1999) recognized a negative relationship between firm size and bank debt, as he found that smaller firms utilized significantly more bank debt. These findings were supported by Hackbarth, Hennessey and Leland (2007) which found that market debt should be a larger fraction of total debt when firm size increases. With our results being largely not significant describing this relationship, they do not determine any particular relationship between firm size and bank debt.

Houston and James (1996), Johnson (1997) and Denis and Mihov (2003) all find that the percentage of market debt to total debt increases with firm size. By assessing our regressions, firm size shows a negative relationship to bond loans, and a positive correlation with program debt. A possible explanation may be that regular bonds have a more rigorous issuing process than program debt (Fabozzi, 2005). Program debt is the debt instrument with the highest coefficient in magnitude. This indicates that when a firm changes in firm size it

will prefer to issue the most accessible debt instrument. When the company is in the position to retire debt, it will, for the same rationale, prefer to retire program debt, as this leaves room for potential issues of program debt in the future if higher leverage is needed.

The positive relationship between program debt and firm size is also supported by the findings of Rauh and Sufi (2010), however, this relationship is not discussed exhaustive in previous research.

All our findings indicate a negative relationship between firm size and mortgage debt. This is coherent with previous studies (Barclay & Smith, 1995 and Lasfer, 1999) which finds a significant negative dependence of secured debt on firm size in their samples. As mortgage is secured debt by definition, this should prove to be valid rationale for mortgage debt as well.

Convertible debt shows a negative significant relationship with firm size for the initial multivariate regression, the multivariate regression with a year specific variable and the multivariate regression with profitability split. The remaining regressions also show a negative relationship, though not significant. Thus we do question what to assess from this, as our results contradicts the findings of Lasfer (1999), which suggests that larger firms rely more heavily on convertible debt than smaller firms.

The category for other debt, however, shows a positive significant relationship with firm size in all our multivariate regressions and in the Mann-Whitney test, except the regressions including market-to-book ratio and profitability split. This relationship has not been discussed uniformly in the literature on debt structure, as the relationship obviously will be entirely defined by the types of debt included in the *other* category. Amongst others, we have included acquisition notes and financial leases in this category. Larger firms have a relative advantage in issuing public debt (Barclay & Smith, 1995), and capital leases are never issued publicly. This aspect suggests a negative correlation between *other* debt and firm size. On the other hand, the size of a company is a function of the firms' past investment opportunities (Barclay & Smith, 1995) suggesting that larger firms are relying on acquisition financing to a larger extent than smaller firms. This may a reasonable explanation for why other debt is positively dependent on firm size. Nevertheless, because the *other* debt category also includes unclassified issues, the properties of the incorporated issues differ largely, and thus we cannot say anything more specific about the underlying relationships.

Our examination of the effect of firm size on the utilized level of secured debt to total interest bearing debt, suggests a negative relationship. This is the same relationship recognized by Lasfer (1999) for UK companies, a view supported by Barclay and Smith (1995) and our findings regarding mortgage debt.

With regards to senior unsecured debt, the initial multivariate regression, the one including a year specific variable and the one with a profitability split, show a positive relation to firm size. This is corresponding to the findings of Lasfer (1999) for UK companies, recognizing that large companies generally issues unsecured and subordinated securities. However, our findings are diverging on this relationship, and we are not able to perform a proper assessment of these findings.

Our findings is coherent with Lasfer (1999) and Barclay and Smith (1995) which suggest a positive relation between firm size and the fraction of subordinated debt, as all our multivariate regressions support this. Evidently, our findings support empirical research, but this is not thoroughly discussed in these studies and we thus choose not to elaborate further on the underlying relationships.

Our results indicate that firm size has positive correlation with the level of public debt. This suggests that larger companies use more public debt, i.e. more public bonds and public medium term notes. This is consistent with the findings done when examining the effect of firm size on the different types of debt, as we recognized a positive relationship between program debt and firm size for Nordic countries. Our finding is supported by Barclay and Smith (1995) who recognize that public securities have large fixed costs and substantial scale economies, hence larger companies should have a comparative advantage in issuing public debt compared to smaller firms. The same rationale is applicable to private debt, and according to the majority of our tests firm size has a negative correlation with the level of private debt, These findings are consistent with the empirical results obtained by Lasfer (1999) for UK companies, and Hackbarth, Hennessey and Leland (2007).

Collateral value

We have used the intangible asset ratio to elucidate the relationship between collateral value and debt structure.

The Mann-Whitney test suggests that the Nordic companies with the highest intangibility ratio have the lowest amount of bank debt. This result is contradicted by the initial

multivariate regression and the one including the market-to-book ratio, which shows a positive significant coefficient for the intangible asset ratios effect on the fraction of bank loans. The other multivariate regressions do not provide any significant coefficients, which means that our findings is in compliance with Rauh and Sufi (2010) which do not find any clear relationship between the intangible asset ratio and the fraction of bank debt.

Total leverage increases with tangibility (Rauh & Sufi 2010), but our findings suggest that this increase not is related to an increase in the fraction of bank debt utilized. Consequently, our results indicate that the level of bank debt not is dependent on the intangible asset ratio. A reasonable explanation is the opportunity of the bank to monitor the company, so when there is a banking relationship between the borrower and the lender, there is less need for collateral, as monitoring may substitute physical collateral (Berger & Udell, 1995). This may explain the non-existent dependency between bank loans and intangibility.

Monitoring opportunities are not present to the same extent for bondholders and holders of program debt as for banks, so as intangibility decrease leverage, these should decrease as intangibility increase. The Mann-Whitney test proposes that as the intangible asset ratio increases, the level of bonds to total debt decrease. This is a significant relationship at 1%, which is supported by the multivariate regression including year specific effects and profitability split. However, the remaining multivariate regressions show no clear support for this relationship. In addition, our results unanimously show that intangibility has a positive effect on program debt for the sample companies (except the market-to-book regression). These findings are opposite of Rauh and Sufi (2010).

Mortgage debt is significant negatively correlated with the intangible asset ratio for all our multivariate regressions. This finding is supported by the linear regressions. Bank debt does not show any relationship with tangibility in our sample, apparently due to the ability of monitoring by the banks. As tangibility has been shown to have a positive effect on leverage (Rauh & Sufi 2010), this may stipulate that debt tied to tangibility, such as mortgage securities, should decrease the most when intangibility increases. Firms might find it advantageous to issue secured debt because of the lemons problem (Myers and Majluf, 1984). It might be costly to issue securities where management have better information than investors, but these costs can be avoided by issuing debt secured by property with known values. Consequently, firms with assets that can be used as collateral may be expected to issue more debt to take advantage of this opportunity (Titman & Wessels, 1988). Our

findings support this rationale, as the tests consistently suggest that mortgage decreases with intangibility.

Convertible debt shows a positive significant relationship with intangibility for the first two multivariate regressions and the one including profitability split, which is consistent with the findings of Rauh and Sufi (2010). This is coherent with our findings related to mortgage. When intangibility is increasing, the asset value of the firm becomes less certain, and management can avoid the lemon problem of increased asymmetric information by utilizing convertibles instead of issuing equity.

The intangible asset ratio do not show any clear relationship with secured or senior unsecured debt, but do show a positive relationship with subordinated debt for the majority of the multivariate regressions. When a company's intangible asset ratio increases the fraction of assets available for collateral decreases. This should decrease the fraction of secured debt. Increasing intangible asset ratio should lead to a higher loss given default (Weiss, 1990, referred to in Johnsen, 2011b, p. 12). Ceteris paribus, this should lead to a higher yield on the debt of the company (Håvik, 2011). By issuing subordinated debt, a company can increase the residual claim on the assets, and thus counter the loss given default on the main credit line. Consequently, we will expect to see subordinated bonds increase with intangibility.

Public listing

The dummy variable representing whether companies are listed or not has been included to enlighten any significant relationships between a public listing and debt structure.

Our findings do not reveal any relationship between specific types of debt and whether a company is listed, except for a positive relation to other debt. In addition, the multivariate regression including the profitability split shows a significant negative relationship between bank debt and listing. This might be due to decreased asymmetric information as a company is listed.

The dummy variable for listing shows no clear relationship with secured and senior unsecured debt. When it comes to subordinated debt, our findings indicate a negative relationship. This means that listed companies in the Nordics utilize a lower fraction of subordinated debt than non-listed companies. We believe this finding to be realistic, because companies that are not listed will typically enclose less information about their operations and financing. The information is more asymmetrical with regards to private companies (Johnsen, 2011b), which results in investors demanding a higher residual in order to accept the same yield.

Some of our multivariate regressions also suggest that listing and public debt is negatively correlated, but others show no clear correlation. We believe that our findings lack sufficient consistency in order to ascertain something specific regarding these relationships.

Credit rating

The dummy variable for rating has been included in the multivariate regressions to examine whether possessing a credit rating itself is affecting debt structure.

Our findings indicate that there is a negative relationship between the level of bank loans, and whether the company has a rating. We find this to be a sensible connection, as paying to get a rating and then increase bank loans will be a reverse logic. Banks have monitoring opportunities, and are not dependent on a credit rating in order to disburse loans, which is coherent with the findings of Faulkender and Petersen (2006) which recognize that rated companies issue more bonds and program debt. In addition, banks may have more information about the borrower than credit agencies. This rationale suggests a negative relationship between the level of bank loans and whether the company is rated.

The discussion on bank loans and credit rating is partly supported by our findings on the relationship between program and bond loans, and whether a company is rated. For the majority of the multivariate regressions, this relationship is valid.

Mortgage debt shows no significant relationship with the dummy variable for rating. We assess this to be a sensible relationship, as mortgage should not have any relationship with rating as mortgage removes the risk associated with probability of default which rating is measuring (Moody's, 2012b).

Whether a company is rated or not show no significant consistent relationship with secured and senior unsecured debt. However, our multiple regressions unanimously suggest a positive correlation between having a credit rating and the fraction of subordinated debt. Assuming that increased information is one of the advantages with being listed or rated, we would assume that the effect of whether a company is rated on subordinated debt would be the same as for listing and subordinated debt. Hence, we would expect the relationship between having a credit rating and the fraction of subordinated debt to be negative. Empirical studies on this matter is limited, which prohibits us from discussing these findings further in light of empirical theory

Our findings indicate that rated companies in the Nordics have a larger fraction of public debt, and a lower fraction of private debt. We assess this to be an intuitive result corresponding to the findings of Houston and James (1996) and Cantillo and Wright (2000), as companies typically pay for ratings to issue bonds and other notes. Private debt will include bank debt, which we have observed being negatively correlated with companies having a credit rating.

Credit quality

A variable for rating is included in a separate multivariate regression due to the multicollinearity with profitability. Credit quality has been defined in theoretical research as the primary source of variation driving a firm's optimal debt structure (Diamond, 1991b and Bolton & Freixas, 2000).

Our findings suggest that rating has a negative effect on the level of bank loans. This is supported by both the linear and the multivariate regression, and corresponds to the findings of previous studies. Hackbart, Hennessey and Leland (2007), Bolton and Freixas (2000) and Rauh and Sufi (2007) all find that rating have a negative correlation with bank loans.

The negative relationship between bank debt and rating can be explained with the pecking order theory. This relates to the relationships stated when discussing profitability above. Consequently, our findings for Nordic companies suggest the same relationship between rating and the level of bank debt as established literature and theory.

When it comes to bond loans, the Mann Whitney test suggests a negative relationship with the level of bond loans. On the other hand, both the linear and multivariate regressions show no significant relationship between bond loans and rating. Bolton and Freixas (2000) states that firms should move from bank to non-bank debt as rating improves, and this is supported by literature in general (Diamond, 1991b, Chemmanur & Fulghieri, 1994 and Boot & Thakor, 1997).

The findings on the relationship between bonds and rating suggest that Nordic companies differ from U.S companies with regards to bond loans. By looking at program debt, however, the relationship to rating is positive. This is in line with established empirical theory from the U.S., and corresponding to the results of Bolton and Freixas (2000). This is also supported by Rauh and Sufi (2010) which finds that lower credit-quality firms do not have access to program debt. Figure 3 indicates a large difference in the utilization of program debt between investment grade and speculative grade for Nordic countries.

Our results indicate a negative relationship between credit rating and secured debt. This is consistent with Rauh and Sufi (2010) which states that companies with a higher credit rating almost exclusively rely on senior unsecured debt. Our regressions also stipulate that lower credit rating have a positive relationship with the level of subordinated debt. This can be explained by companies with lower credit ratings utilizing multiple tiers of debt, including subordinated and secured issues (Rauh & Sufi, 2010).

Growth expectations

Our findings indicate no significant relationships between the market-to-book ratio and the different debt types, except for program debt. This is an interesting finding, as high market-to-book indicates a company that is expected to grow in the future. Empirical studies suggest that firms with a high market-to-book ratio use less leverage (Rauh & Sufi, 2010). The capital structure of such companies is typically changing along with the company's growth making us believe these companies are exploiting the dynamic nature of medium term notes.

Year specific relationships

The year specific variables are not significant at a large, which indicates no relationship between the year and the type of debt. By assessing the average utilization rate in figure 1, it seems to be some regression trends that are not captured by our models.

Industry effect

The NACE codes, which represent different industries, show that there are significant differences among the industries in terms of determinants of debt structure. These codes were initially included in our model in order to philtre out noise, and thus make the remaining parameters more accurate. The NACE codes do, however, tell a story of their own as they clearly indicate differences among industries. Nevertheless, this is of limited information value due to the low number of companies included in each category.

Nation effect

By including a dummy variable for country, we obtained the regression with the highest R-squared. Examining the results of the regression suggests significant differences in debt structure amongst the Nordic countries. This is interesting and as most studies on debt structure are focused on the U.S., few studies have discussed differences between countries regarding debt structure.

However, we have few companies representing each country, and we have the same problem as with the industry effects. They do provide limited information value.

Financial crisis adjustment

An adjustment for the financial crisis is included to compensate for what seems like an evident trend in debt structure in the years from 2008 to 2010 in figure 1. The financial crisis variable indicates a decrease in the utilization of bonds and bank debt over these years, and an increase in the utilization of program debt. The decrease in bond utilization is highly significant, whereas the effect on bank and program debt is somewhat questionable as one out of three regressions yields opposite coefficients (positive for bank and negative for program). The clearly negative coefficient describing the financial crisis' influence on bond utilization is not observable in figure 1, as bond utilization declines sharply just prior to 2008. Still, the variables indicate that there have been factors, other than our firm variables, that have influenced the fractions of debt utilization in the years between 2008 and 2010.

4.3 Significance of unexplained variation

We have through previous sections established some factors that are likely to have a substantial impact on a company's debt structure. However, we are also keen on examining whether firms tend to alter their debt structure even if firm specific variables stay constant. We regard this as a supplement to the section 4.2, in order to back our earlier findings. Our regression models establish relationships between different firm variables and debt instruments, seniority and whether debt is public or private. If our models are to have substantial practical implications then a company with similar levels of firm variables two years in a row should keep their debt structure constant. We have examined this by identifying changes in debt structure and parameters and then tested, using a normal Student's T-test, whether the observed changes are significant.

Rauh and Sufi (2010) examine in their 2010 paper if companies tend to alter their debt structure if leverage ratio stays constant. Their approach has some similar characteristics, but their motivation for the examination is somewhat different as they do not do any significance test on their result. Rauh and Sufi (2010) state that a 2.5% change in leverage ratio is too small to claim there to actually be an alteration to the leverage ratio, thus they regard all changes below 2.5% to be not significant. We have eased somewhat on the 2.5% restriction. This is first of all due to uncertainties related to currency effects. We need a larger wiggle room when doing a similar test in the Nordic countries due to fluctuating currencies. Rauh and Sufi (2010) have neglected the currency effect as a whole, an approach that could be subject for discussion on its own. However, it is reasonable to believe that US companies tend to have a lower fraction of debt in foreign currencies than Nordic countries. We have thus increased the limit to 5%. All observations where change in gross leverage ratio is greater than 5% is thus considered as years where a firm has altered the level of debt, which might justify an alteration of the debt structure.

In addition to the gross leverage ratio firm variables are kept constant. Through our previous regression analyses we believe that profitability, firm size and credit rating are the most influencing firm variables when it comes to determining debt structure. We have thus rejected all observations where the credit rating has changed between two years or where there has been more than 5% change in firm size and profitability. Philtring our data sample using these limitations leaves us with 13 companies. To get statistical interference from 13

observations is difficult. The data should, nevertheless, contain interesting findings as long as we are aware that extreme observations will have a vast impact on the estimated figures.

To determine whether the different debt categories have changed, even if the most important parameters have remained constant, we make the assumption that expected change in utilization of any particular debt category should be zero if the firm variables stay constant. Using the Student's t-test we are then able to test whether the observed changes are significant.

In the test we use the average of the absolute changes in percentage point. Thus a company chancing its fraction of utilized bank debt from 18% to 20% yields the same average change as a company changing the fraction of utilized bank debt from 2% to 4%. The average of the 13 observations leases us with a sample mean which is the mean change in utilization of different debt classes.

The Student's- test projects a t-value through the equation: $= (\bar{x} - \mu)/(s/\sqrt{n})$, where $\bar{x}$ is the sample mean, μ is the expected mean, s is the sample standard deviation and n the number of observations. We test whether the t-value is significant through the hypotheses:

H_0: Expected mean equals zero

H_A: Expected mean is not equal to zero

To justify the use of the t-test we must assume that change in utilization of a particular debt class is normally distributed. Claiming that the observations are normally distributed should prove to be a fair assumption because we are assessing the changes in utilization, and not the utilization level in itself. Due to our low number of observations we have, however, no opportunity to examine whether this assumption is valid. The test should still prove to yields an interesting insight.

4.3.1 Findings

Table 14 presents a summary of the average change in debt utilization, the associated standard deviation, and the maximum and minimum values of the sample.

TABLE 14 - AVERAGES AND STANDARD DEVIATION

The following table presents the average change in debt structure, the associated standard deviation of the sample, and the highest and the lowest value within the sample, in the years where certain criteria's have been met. The criteria's being that the observed changes in debt utilization when corporate rating remains unchanged, change in gross leverage ratio, profitability and firm size is 5% at a maximum.

Averages and standard deviation - 13 observations

	Average	St.dev	Max	Min
Gross debt	-0.008	0.016	0.021	-0.031
Sales	0.001	0.042	0.050	-0.050
Profitability	0.001	0.005	0.010	-0.006
Bank loans	-0.109	0.290	0.188	-0.984
Bonds	0.005	0.031	0.090	-0.035
Program	0.081	0.282	0.980	-0.202
Mortgage	0.008	0.085	0.261	-0.137
Convertible	0.000	0.000	0.000	0.000
Mezzanine	0.000	0.000	0.000	0.000
Other	0.015	0.056	0.153	0.047
Secured	0.011	0.085	0.261	-0.137
Sen.Unsec.	-0.041	0.119	0.119	-0.271
Subord.	-0.002	0.004	0.000	-0.011
Public	0.110	0.270	0.980	-0.300

Table 14 indicates that the average change in gross debt, sales and profitability is low, -0.008, 0.001 and 0.001 respectively. This, however, is as expected because we discard all observations where change is greater than 5%. The standard deviations also have low values. They do indicate, however, that there is some variation even if we limit the sample to observations lower than 5%.

Bank loans have the highest average change in magnitude the different debt instruments, being -10.9%. This is mainly due to one observation where bank loans decrease by 98.54%. The standard deviation is thus rather large; being 29.0% Bonds remain rather constant with an average change of 0.5% and a standard deviation of 3.1%. Program debt, on the other hand has an average change of 8.1%, mainly due to one observation where program debt increase by 98.0%. The standard deviation is thus at the same level as bank loans, being 28.2%

The other debt instruments change little on average. Mortgage and other debt have average changes of 0.8% and 1.5% respectively, whereas there are no observed changes to convertibles and mezzanine.

Secured, senior unsecured and subordinated debt changes 1.1%, -4.1% and -0.2% on average, with standard deviations being 8.5%. Public debt has the highest average change of all the debt classes, with an average change of 11%. The standard deviation is also amongst the highest being 27%.

The sample averages and standard deviations described above yields p-values as presented in table 15.

TABLE 15 - P-VALUES

The table presents the p-value derived from Studen't T-tests.

Firm Variables	P-value
Bank loan	0.202
Bonds	0.600
Program	0.325
Mortgage	0.731
Other	0.353
Secured	0.655
Sen.Unsec.	0.242
Subord.	0.160
Public	0.191

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

4.3.2 Discussion of findings

The results from the t-test show no significant p-values. This does not imply that we can discard the alternative hypothesise and claim that firms do not alter their utilization rate. Assessing table 14 and 15 does, however, make us draw some interesting train of thoughts.

The only debt instruments that shows average changes greater than the 5% limit we initially used as philtre to reduce the sample to 13 observations are bank loans and program debt. The other instruments show small average changes and small standard deviations giving very large p-values. Both program debt and bank loans, however, are heavily influenced by an extreme observation, being the Danish company ISS A/S, which retired a revolving credit program by issuing medium-term notes in 2003. Due to our low number of observations, this incidence has a great influence on our averages and standard deviations. If this observation would have been taken out of the account, the average change would have been -3,5% and 0,56% for bank loans and program debt, respectively.

The results presented in table 14 and 15 underpins the results coming from our regression models in section 4.2, as it indicates that rating, profitability and firm size are the most prominent firm variables. On average firms do not alter their utilization of different debt classes as long as these variables stay constant.

4.4 Examination of fallen angels

As an additional assessment on what determines debt structure we have examined Nordic rated companies that have been downgraded from investment grade to speculative grade at some point between 2001 and 2011. Such firms are called 'fallen angels'. This assessment is interesting in several ways. The coherence between credit rating and debt structure is proven through several empirical studies, amongst them Rauh and Sufi (2007 & 2010). A downgrade from investment grade to speculative grade is the credit rating action that supposedly has the most implications for corporate funding as several institutional investors are prohibited from owning speculative papers. This should indicate that fallen angels will alter their debt structure at some point after the downgrade because the firms meet a new type of investors once the downgraded is a fact.

We have assessed this aspect by comparing the development of the debt structure of Nordic fallen angels to the firms that are not downgraded. We have in addition constructed a new multivariate regression model on the basis of one of the initial multivariate model we used in section 4.2. The model is expanded with three dummy variables. One dummy variable represents the year of downgrade, one represents the year after the downgrade and one represents the second year after the downgrade. If there are a significantly change in the debt structure due to a company becoming a fallen angel we would expect the coefficients associated to these dummy variables to be significant.

The final sample of fallen angel firms in the Nordic consists of Norske Skogindustrier, Reykjavik Energy, Metsa Board, Stora Enso and UPM. Four out of five companies thus belongs to the pulp and paper industry. Hence our figures are clearly biased towards this industry. Five companies is way few companies to get statistical interference, thus we have not performed any hypothesis test, and instead assessed the averages and discussed the development.

As seen from the table 16 there does not seem to be a clear indication on how companies react the same year as they are downgraded. The most prominent change is observed for bonds, which increases by 4.1% in average. The following two year does not seem to yield any major changes in debt structure either, and it it's difficult to spot a trend. Bank loans for instant decrease by 7.6% in average one year after the downgrade, but then increases by 7.1% the second year.

A possible explanation why companies do not seem to alter their debt structure after they are downgrade can be proactive management. There are done several studies on credit rating effect on share price. Morseth and Nørgaard (2011) revealed that the significant change in share price is much higher when a company is put on watch by the credit rating agency, than when it actually gets downgraded. The downgrade itself only yields a small, and barely significant, change. This indicates that the market is somewhat proactive, and it's reasonable to assume the company's management to be the same, especially because management have the insider advantaged over the market.

Table 16 presents the change in debt utilization for the two year leading up to the downgrade. However, the table do not reveal any clear pattern leading up to the downgrade. Bank debt, for instant increase by as much as 16.3% two years prior to the downgrade, but is reduced by 4% the following year.

TABLE 16 - DEBT UTILIZATION AFTER A FALLEN ANGEL DOWNGRADE

The table presents figures illustrating the absolute number of average annual change in debt utilization for a fallen angel. All figures are in percentage of total debt. The number in brackets represents the standard deviation to the observations. t describes the year of the downgrade. t+1 indicates the year after the downgrade, whilst t+2 indicates the second year after the downgrade. t-1 and t-2 indicates the two years leading up to the downgrade

Change in debt structure for Fallen Angels

	Downgrade				
	t-2	t-1	t	t+1	t+2
Bank Loans	0.163	-0.040	0.021	-0.076	0.071
	(0.072)	(0.073)	(0.035)	(0.056)	(0.168)
Bonds	-0.111	0.026	0.041	0.045	-0.041
	(0.055)	(0.037)	(0.059)	(0.102)	(0.207)
Program Debt	-0.044	0.015	-0.032	0.028	0.007
	(0.017)	(0.034)	(0.028)	(0.061)	(0.072)
MBS	-0.004	-0.007	-0.003	-0.007	0.000
	(0.000)	(0.014)	(0.006)	(0.013)	(0.008)
Convertibles	-	-	-	-	-
	-	-	-	-	-
Mezzanine	-	-	-	-	-
	-	-	-	-	-
Other	-0.004	0.037	0.004	0.010	-0.037
	(0.061)	(0.055)	(0.019)	(0.080)	(0.033)
Secured Debt	-0.004	-0.003	-0.003	-0.006	0.005
	(0.009)	(0.014)	(0.006)	(0.017)	(0.008)
Senior Unsecured	0.008	-0.016	0.004	-0.010	0.001
	(0.039)	(0.077)	(0.022)	(0.079)	(0.025)
Subordinated Debt	0.000	0.000	0.000	0.000	0.007
	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)
Public	0.025	0.025	-0.029	0.056	-0.057
	(0.046)	(0.051)	(0.034)	(0.082)	(0.064)

In addition to just looking at absolute changes in utilization, we have also computed a multivariate regression in order to examine if there might be contexts that are obscured by other factors, such as changing firm variables. We have thus computed a regression equation on the basis of our initial multivariate regression model and added a dummy variables indicating the year of the downgrade and the following two years.

The regression equation we have used is

$$Debt_y = \beta_0 + \beta_1(EBIT/Sales) + \beta_2\big(Ln(Sales)\big) + \beta_3(Intangibile\ asset\ ratio) + \beta_3(Dummy\ variable\ for\ listing) + \beta_4(Dummy\ variable\ for\ rating) + \beta_4(Fallen\ Angel) + \beta_4(FA+1) + \beta_4(FA+2) + \varepsilon_i$$

TABLE 17 - REGRESSION TAKING FALLEN ANGEL FACTOR INTO ACCOUNT

Panel A - Debt instruments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parameters	Bank	Bonds	Program	Mortgage	Convertible	Mezzanine	Other
EBIT/Sales	-0.084***	-0.038**	0.028**	-0.026**	-0.016**		(0.005)
	(0.019)	(0.016)	(0.020)	(0.007)	(0.004)		0.040
Ln(Sales)	-0.023**	0.000	0.033***	-0.010***	-0.012***		0.020***
	(0.009)	(0.008)	(0.010)	(0.004)	(0.002)		(0.010)
Intangibility ratio	0.056	-0.170***	0.233***	-0.051***	0.016*		-0.081***
	(0.041)	(0.036)	(0.045)	(0.017)	(0.010)		(0.005)
Listed	-0.044	0.009	-0.041	-0.015	0.014*		0.074***
	(0.033)	(0.029)	(0.036)	(0.014)	(0.008)		(0.022)
Rated	-0.229***	0.050*	0.184***	0.007	0.015		-0.020
	(0.033)	(0.029)	(0.035)	(0.013)	(0.008)		(0.018)
Fallen Angel	0.225	-0.011	-0.164	-0.040	-0.021		0.005
	(0.122)	(0.108)	(0.132)	(0.049)	(0.029)		(0.017)
FA +1	0.137	0.043	-0.131	-0.046	-0.020		0.017
	(0.122)	(0.108)	(0.132)	(0.049)	(0.029)		(0.065)
FA +2	0.198	0.027	-0.140	-0.048	-0.019		-0.012
	(0.122)	(0.108)	(0.132)	(0.049)	(0.029)		(0.065)
Constant	0.657***	0.218***	-0.132*	0.146***	0.094***		-(0.040)
	(0.074)	(0.065)	(0.080)	(0.030)	(0.017)		0.065
R2 adj.	0.162	0.078	0.163	0.076	0.077		0.115

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Seniority & Public/Private

	(8)	(9)	(10)	(11)	(12)
	Secured	Sen.Unsec	Subordin.	Public	Private
EBIT/Sales	-0.072***	-0.063	0.027***	0.020	-0.126***
	0.015	(0.020)	(0.006)	(0.081)	(0.021)
Ln(Sales)	-0.046***	0.024	0.021***	0.041***	-0.033***
	0.007	(0.010)	(0.003)	(0.020)	(0.010)
Intangibility ratio	(0.001)	-0.022	0.059***	0.082*	-0.087*
	0.033	(0.044)	(0.013)	(0.010)	(0.045)
Listed	-(0.019)	-0.028	-0.080***	-0.033	0.019
	0.027	(0.035)	(0.010)	(0.045)	(0.037)
Rated	(0.006)	0.039	0.039***	0.218***	-0.212***
	0.026	(0.035)	(0.010)	(0.036)	(0.036)
Fallen Angel	-(0.101)	0.095	-0.012	-0.137	0.129
	0.097	(0.129)	(0.037)	(0.036)	(0.134)
FA +1	-0.104	0.083	-0.012	-0.085	0.080
	(0.097)	(0.129)	(0.037)	(0.133)	(0.134)
FA +2	-0.098	0.082	-0.007	-0.134	0.134
	(0.097)	(0.129)	(0.037)	(0.133)	(0.134)
Constant	0.502***	0.509***	-0.133***	-0.110	1.061***
	(0.059)	(0.078)	(0.022)	(0.133)	(0.082)
R2 adj.	0.122	0.083	0.247	0.147	0.174

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

As seen from table 17, the dummy variables introduced do not reveal any significant relationship between whether a company turns into a fallen angels and debt structure. This is coherent with the findings in table 16. However, our univariate and multivariate models in section 4.2 indicates several highly significant relationships with credit rating as a whole and debt structure. Our results in this section is thus likely to be not significant due to the low number of observation, and this topic should thus be subject for future research where more countries are included in order create a larger sample.

5. Limitations and further research

The most important limitation in our study is the number of observations included in our sample. A number of 370 firm year observations are sufficient for our tests, but as they are divided over only 38 companies we risk that our results are biased towards the debt structure of some specific types of companies. When we divide the dataset in smaller categories, we face the problem of not having enough company in each category to draw any conclusions on common features of debt structure.

Looking at companies with a credit rating may also have biased our sample. Our conclusions can probably not be extended to include Nordic companies in general, as rated companies in the Nordics are few, and they are likely to possess some joint features specific for them. It cannot be ruled out that companies with a credit rating have a different debt structure than other companies.

When examining companies that alter their debt structure when their leverage ratio is constant, a weakness is present due to the effect of different currencies. The majority of the sample companies have debt issues in many different currencies simultaneously, so our figures may fail to reflect underlying fluctuations in debt structure as currencies may appreciate or depreciate differently.

Writing this thesis, several topics that could be interesting for further studies have been discussed. As our sample on fallen angels for Nordic countries was very limited, it would have been interesting to include a larger geographical area and follow the same methodology to investigate their debt structure. Furthermore, other properties of corporate debt structure could have been interesting to examine. First of all, the properties of debt maturity could have been examined for Nordic countries. Many empirical studies have been conducted regarding this in the U.S., and an assessment of this in the Nordics could have elaborated on the already stylized facts.

6. Conclusions

This study investigates Nordic credit rated companies' debt structure, and seeks to determine which measurable, firm specific variables that can be used to explain corporate debt structure. We have identified a sample of 38 companies that have held a long-term credit rating by Moody's Investor Services prior to 2012. Through annual reports, databases and other publicly available information, we have developed an extensive dataset describing the debt structure of the sample companies for 11 years from 2001 through 2011.

Based on multivariate regressions, a detailed analysis of the relationships between firm specific variables and different types of debt has been conducted. The results indicate that several firm specific variables are determining the debt structure of Nordic companies with a credit rating. The most influential variables based on our findings are profitability, firm size, intangibility and rating.

As the pecking order theory predicts, profitability is significantly affecting the utilization of bank loans, as well as mortgage debt for the companies in the sample. Our research on Nordic companies with a credit rating shows that a reduced profitability will increase a company's fraction of bank debt to total debt. In addition, a negative relationship between mortgage debt and profitability exists. A decrease in profitability will increase the utilization of mortgage debt, especially when the profitability is negative.

The results indicate that empirical established relationships in relation to firm size also are present in our sample. Our dataset shows a positive correlation between firm size and utilization of public debt. Program debt is the main reason why this relationship applies for rated companies in the Nordics.

We cannot identify any relationship between bank debt and the level of intangibility. This indicates that bank monitoring can function as a substitute for collateral, as demonstrated by previous research. A positive relationship between tangibility and leverage ratio has also been established by earlier empirical studies, and our findings indicate that this positive relationship mainly is derived by the accessibility of mortgage loans.

Our data indicates that the motivation behind obtaining a credit rating is access to arms-length market debt. Nordic company, when rated, increases its level of public debt to total debt substantially.

When assessing 'fallen angels' we were not able to determine any significant trends in debt alteration due to the downgrade. This is believed to be due to a limited sample.

7. References

Akerlof, G. A. (1970) The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 84 (3), pp. 488-500.

Baird, D. G. & Rasmussen, R.K. (2006) Private Debt and the Missing Lever of Corporate Governance. *University of Pennsylvania Law Review*, 154 (5), pp. 1209-1252.

Barclay, M. J. & Smith, C. W. (1995) The Priority Structure of Corporate Liabilities. *The Journal of Finance*, 50 (3), pp. 899-916.

Berger, A. N. & Udell, G. F. (1995) Relationship Lending and Lines of Credit in Small Firm Finance. *The Journal of Business*, 68 (3), pp. 351-381.

Berk, J. & DeMarzo, P. (2011) *Corporate Finance*. 2nd ed. Boston, Pearson Education.

Bolton, P. & Freixas, X. (2000) Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information. *Journal of Political Economy*, 108 (2), pp. 324-351.

Boot, A. & Thakor, A. V. (1997) Financial System Architecture. *The Review of Financial Studies*, 10 (3), pp. 693-733.

Brown, S. J., Goetzmann, W., Ibbotson, R. G. & Ross, S. A. (1992) Survivorship Bias in Performance Studies. *The Review of Financial Studies*, 5 (4), pp. 553-580.

Cadsby, C. B., Frank, M. & Maksimovic, V. (1990) Pooling, Separating, and Semiseparating Equilibria in Financial Markets: Some Experimental Evidence. *The Review of Financial Studies*, 3 (3), pp. 315-342.

Chemmanur, T. J. & Fulghieri, P. (1994) Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt. *The Review of Financial Studies*, 7 (3), pp. 475-506.

Denis, D. & Mihov, V. (2003) The Choice among Bank Debt, Non-bank Private Debt, and Public Debt: Evidence from New Corporate Borrowings. *Journal of Financial Economics*, 70 (1), pp. 3-28.

Diamond, D. W. (1991a) Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. *Journal of Political Economy*, 99 (4), pp. 689-721.

Diamond, D. W. (1991b) Debt Maturity Structure and Liquidity Risk. *The Quarterly Journal of Economics*, 106 (3), pp. 709-737.

Dittrich, F. (2007) *The Credit Rating Industry: Competition and Regulation.* PhD Thesis, University of Köln.

European Commission. (2012) *List of NACE Codes* [Internet], Available from: <http://ec.europa.eu/competition/mergers/cases/index/nace_all.html> [Accessed 5 December 2012]

Eurostat. (2012) *NACE Backgrounds* [Internet], Available from: <http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/NACE_backgrounds> [Accessed 3 December 2012]

Fabozzi, F. J. (2005) *The Handbook of Fixed Income Securities*. 7th ed. New York. McGraw-Hill.

Fama, E. F. & French, K. R. (2002) Testing Trade-Off and Pecking Order Predictions about Dividends and Debt. *The Review of Financial Studies*, 15 (1), pp. 1-33.

Federal Accounting Standards Advisory Board. (2012) *Authoritative Source of Guidance* [Internet], Available from: <http://www.fasab.gov/accounting-standards/authoritative-source-of-gaap/#gaap> [Accessed 26 November 2012]

Fitch. (2012) *Definitions of Rating and other Forms of Opinion.* [Internet], Available from: <http://www.fitchratings.com/web_content/ratings/fitch_ratings_definitions_and_scales.pdf> [Accessed 22 November 2012]

Frank, M. Z. & Goyal, V. K. (2007) *Trade-off and Pecking Order Theories of Debt.* Working Paper, Hong Kong University of Science and Technology.

Hackbarth, D., Hennessey, C. A. & Leland, H. E. (2007) Can the Trade-off Theory Explain Debt Structure? *The Review of Financial Studies*, 20 (5), pp. 1389-1428.

Harvard Business School. (2012) *DealScan* [Internet], Available from: <http://www.library.hbs.edu/go/trdealscan.html> [Accessed 20 November 2012]

Hoogervorst, H. (2012) *Financial Reporting for the World's Interconnected Financial Markets* [Internet], Available from: <http://www.ifrs.org/The-organisation/Pages/financial-reporting.aspx> [Accessed 26 November 2012]

Houston, J. & James, C. (1996) Bank Information Monopolies and the Mix of Private and Public Debt Claims. *The Journal of Finance*, 51 (5), pp. 1863-1889.

Håvik, H. (2011) *Credit: All You Ever Need to Know.* Guest Lecture in FIE402, Corporate Finance, NHH, November 2011.

International Securities Identification Numbers Organisation. (2012) *About International Securities Identification Number (ISIN)* [Internet], Available from: <http://isin.org/site/page?view=about> [Accessed 20 November 2012]

Johnsen, T. (2011a) *Capital Structure*. Lecture Note in FIE402, Corporate Finance, NHH, 10 October 2011.

Johnsen, T. (2011b) *Selling Securities*. Lecture Note in FIE402, Corporate Finance, NHH, 25 October 2011.

Johnson, S. (1997) An Empirical Analysis of the Determinants of Corporate Debt Ownership Structure. *Journal of Financial and Quantitative Analysis*, 32 (1), pp. 47-69.

Keller, G. (2005) *Statistics for Management and Economics*. 7th ed. London, Thomson.

Kraus, A. & Litzenberger, R. H. (1973) A State-Preference Model of Optimal Financial Leverage. *The Journal of Finance*, 28 (4), pp. 911-922.

Lasfer, M. A. (1999) *Debt Structure, Agency Costs and Firm's Size: An Empirical Investigation*. Working Paper, City University Business School.

Mjøs, A. (2012) *Debt Financing: Complexity and Distress*. Lecture Note in FIE428, Cases in Corporate Finance, NHH, 8 March 2012.

Modigliani, F. & Miller, M. (1963) Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, 53 (3), pp. 433-443.

Moody's. (2012a) Nordic Rating Activity. [Internet], Available from: <http://www.moodys.com/researchandratings/market-segment/corporates/-/005000/4294966622%204294964777/4294967230/0/0/-/0/-/-/-/-/-/-/-/en/global/pdf/rra> [Accessed 30 November 2012]

Moody's. (2012b) *Rating Symbols and Definitions*. [Internet], Available from: <http://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_79004> [Accessed 30 November 2012]

Morseth, K. & Nørgaard, P. (2011) *The Impact of Credit Rating Announcements on Norwegian Equities.* Master Thesis, NHH.

Myers, S.C. (1984) The Capital Structure Puzzle. *The Journal of Finance*, 39 (3), pp. 575-592.

Myers, S.C. & Majluf, N. S. (1984) Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics*, 13 (2), pp. 187-221.

Oslo Børs. (2012) *NewsWeb* [Internet], Available from: <http://www.newsweb.no/newsweb/search.do> [Accessed from 1 September – 1 December 2012]

Park, C. (2000) Monitoring and Structure of Debt Contracts. *The Journal of Finance*, 55 (5), pp. 2157-2195.

Pulvino, T. C. (1998) Do Asset Fire Sales Exist? An Empirical Investigation of Commercial Aircraft Transactions. *The Journal of Finance*, 53 (3), pp. 939-978.

PwC. (2012) *IFRS and US GAAP: Similarities and Differences* [Internet], Available from: <http://www.pwc.com/en_US/us/issues/ifrs-reporting/publications/assets/ifrs-and-us-gaap-similarities-and-differences-2012.pdf > [Accessed 27 November 2012]

Rajan, R. G. & Zingales, L. (1995) What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance*, 50 (5), pp. 1421-1460.

Rauh, J. D. & Sufi, A. (2007) *The Composition and Priority of Corporate Debt: Evidence from Fallen Angels*. Working Paper, University of Chicago.

Rauh, J. D. & Sufi, A. (2010) Capital Structure and Debt Structure. *The Review of Financial Studies*, 23 (12), pp. 4242-4280.

Smith, C. W. & Warner, J. B. (1979) Bankruptcy, Secured Debt, and Optimal Capital Structure: Comment. *The Journal of Finance*, 34 (1), pp. 247-251.

Standard & Poor's. (2011) *Guide to Credit Rating Essentials: What Are Credit Ratings and How Do They Work?* [Internet], Available from: <http://img.en25.com/Web/StandardandPoors/SP_CreditRatingsGuide.pdf> [Accessed 22 November 2012]

Stein, J. C. (1992) Convertible Bonds as "Back Door" Equity Financing. *Journal of Financial Economics*, 32 (2), pp. 3-21.

Thomson Reuters. (2012) *Products A-Z: Thomsonone.com Investment Banking* [Internet], Available from: <http://thomsonreuters.com/products_services/financial/financial_products/a-z/thomsononecom_ib/> [Accessed 20 November 2012]

Titman, S. & Wessels, R. (1988) The Determinants of Capital Structure Choice. *The Journal of Finance*, 43 (1), pp. 1-19.

8. Appendix

8.1 Credit rating symbols

TABLE 18- CREDIT RATING SYMBOLS USED BY THE LARGEST CREDIT RATING AGENCIES

Overview of the rating symbols applied by the three largest credit rating agencies
Sources: S&P (2012), Moody's (2012) and Fitch (2012)

	Symbol			Description
	Moody's	S&P	Fitch	
Investment Grade	Aaa	AAA	AAA	Prime
	Aa1	AA+	AA+	High grade
	Aa2	AA	AA	
	Aa3	AA-	AA-	
	A1	A+	A+	Upper medium grade
	A2	A	A	
	A3	A-	A-	
	Baa1	BBB+	BBB+	Lower medium grade
	Baa2	BBB	BBB	
	Baa3	BBB-	BBB-	
Speculative Grade	Ba1	BB+	BB+	Non-investment grade speculative
	Ba2	BB	BB	
	Ba3	BB-	BB-	
	B1	B+	B+	Highly speculative
	B2	B	B	
	B3	B-	B-	
	Caa1	CCC+		Substantial risks
	Caa2	CCC+		Extremely speculative
	Caa3	CCC-	CCC	
	Ca	CC		In default with little prospect for recovery
		C		
Default	C	D	DDD	In default
			DD	
			D	

TABLE 19- RATING SYMBOLS USED BY MOODY'S

Overview of credit rating symbols used by Moody's
Source: Moody's (2012)

Symbol	Description
Aaa	Obligations rated Aaa are judged to be of the highest quality, subject to the lowest level of credit risk
Aa	Obligations rated Aa are judged to bo of high quality and are subject to very low credit risk
A	Obligations rated A are judged to be upper-medium grade and are subject to low credit risk
Baa	Obligations rated Baa are judged to be medium-grade and subject to moderate credit risk an as such may posses certain speculative characteristics
Ba	Obligations rated Ba are judged to be speculative and are subject to substantial credit risk
B	Obligations rated B are considered speculative and are subject to high credit risk
Caa	Obligations rated Caa are judged to be speculative of poor standing and are subjective to very high credit risk
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest
C	Obligations rated C are the lowest rated and are typically in default, with little prospect for recovery of principal or interest

8.2 Sample of companies

TABLE 20- FINAL SAMPLE

The selection of firms included in the study with the corresponding type of rating used in the analysis. Firms are listed alphabetically, sorted by country, with issue year and the year the respective rating was withdrawn[11]*. Source: Moody's (2012)*

Panel A - Final sample companies from Norway

Company	Issued	Withdrawn	Type of rating
Norsk Hydro ASA	2007	No	LT Issuer Rating
Norges Statsbaner AS	1999	No	LT Issuer Rating
Norske Skogindustrier ASA	2006	No	LT Corporate Family Ratings
Petroleum Geo-Services ASA	2007	No	LT Corporate Family Ratings
Songa Offshore SE	2010	No	LT Corporate Family Ratings
Statkraft SF	2003	2004	LT Issuer Rating
Telenor ASA	1996	No	Senior Unsecured
Yara International ASA	2004	No	LT Issuer Rating

Panel B - Final sample companies from Sweden

Company	Issued	Withdrawn	Type of rating
AB Volvo	2005	No	LT Issuer Rating
Alfa Laval Holding AB	2004	2005	LT Issuer Rating
Atlas Copco AB	1998	No	Senior Unsecured
Electrolux AB	1989	1992	Senior Unsecured
Nobina AB	2000	No	LT Corporate Family Ratings
Preem Holdings AB	2001	2005	LT Corporate Family Ratings
Saab AB	1989	1992	Senior Unsecured
SAS AB	2004	No	LT Corporate Family Ratings
Securitas AB	2000	2008	Senior Unsecured
SKF AB	1992	No	Senior Unsecured
Song Networks	1999	2003	LT Corporate Family Ratings
Stena AB	1999	No	LT Corporate Family Ratings
Svenska Cellulosa Akt. SCA	1994	No	Senior Unsecured
Swedish Match AB	1999	No	Senior Unsecured
TeliaSonera AB	1999	No	Senior Unsecured
Vattenfall AB	1995	No	LT Issuer Rating

[11] LT = Long-term

Panel C - Final sample companies from Denmark

Company	Issued	Withdrawn	Type of rating
Carlsberg Breweries A/S	2006	No	LT Issuer Rating
DONG Energy A/S	2004	No	LT Issuer Rating
ISS A/S	2006	No	LT Corporate Family Ratings
Novo Nordisk A/S	2004	No	LT Issuer Rating
TDC A/S	2011	No	LT Issuer Rating

Panel D - Final sample companies from Iceland

Company	Issued	Withdrawn	Type of rating
Landsvirkjun	1998	No	BACKED Senior Unsecured
Reykjavik Energy	2007	No	LT Issuer Rating

Panel E - Final sample companies from Finland

Company	Issued	Withdrawn	Type of rating
Elisa Corporation	2000	No	LT Issuer Rating
Fingrid Oyj	1999	No	Senior Unsecured
Fortum Oyj	2002	No	LT Issuer Rating
Metsa Board Corporation	2003	No	LT Corporate Family Ratings
Nokia Oyj	2009	No	Senior Unsecured
Stora Enso Oyj	2008	No	LT Corporate Family Ratings
UPM-Kymmene	2009	No	LT Corporate Family Ratings

TABLE 21- COMPANIES EXCLUDED FROM THE FINAL SAMPLE

The selection of firms omitted from the study with the corresponding reason for excluding them is presented. The companies are listed alphabetically, sorted by country.

Panel A - Excluded companies from Norway

Company	Type of rating	Reason for omission
Aker Kvaerner AS	BACKED Senior Unsecured	No available annual reports
Aker Kvaerner O&G Group AS	LT Issuer Rating	No available annual reports
Det Norske Oljeselskap AS	Senior Unsecured	Not sufficient information
Enitel ASA	LT Issuer Rating	No available annual reports
Findexa II AS	LT Corporate Family Ratings	Not sufficient information
Frontier Drilling ASA	LT Corporate Family Ratings	Not sufficient information
Northern Offshore ASA	LT Corporate Family Ratings	Not sufficient information
Ocean Rig Norway AS	LT Corporate Family Ratings	Not sufficient information
Saga Petroleum ASA	Senior Unsecured	Not sufficient information
Schlumberger Norge AS	BACKED Senior Unsecured	Not sufficient information
Statholding AS	BACKED Senior Unsecured MTN	Subsidiary with insufficient information
Statoil ASA	Senior Unsecured	Not sufficient information
Trico Shipping AS	LT Corporate Family Ratings	No available annual reports

Panel B - Excluded companies from Sweden

Company	Type of rating	Reason for omission
Asea Capital Corp BV	BACKED Senior Unsecured	No available annual reports
AssiDoman AB	Senior Unsecured	Not sufficient information
Corral Investment AB	LT Corporate Family Ratings	Not sufficient information
Corral Petroleum Holdings AB	Senior Unsecured	Not sufficient information
Dometic Group AB	Senior Unsecured	Not sufficient information
Dometic Koncern AB	LT Corporate Family Ratings	Not sufficient information
Esselte Group Holdings AB	LT Issuer Rating	Subsidiary with insufficient information
Fortum Power and Heat AB	Senior Unsecured MTN	Subsidiary of Fortum Oyj
Mo och Domsjo AB	Senior Unsecured	Not sufficient information
Norcell Sweden Holding 2 AB (publ)	LT Corporate Family Ratings	Subsidiary with insufficient information
Octapharma Nordic AB	LT Corporate Family Ratings	No issues in SDC Platinum
Orlen Capital AB	BACKED Senior Unsecured	Not sufficient information
Telefonaktiebolaget LM Ericsson	Senior Unsecured	Not sufficient information

Panel C - Excluded companies from Denmark

Company	Type of rating	Reason for omission
Angel Lux Common S.A.	LT Corporate Family Ratings	Not sufficient information
CP Kelco Aps	LT Issuer Rating	Not sufficient information
Elsam I/S	Senior Unsecured	Not sufficient information
Energi E2 A/S	Senior Unsecured	Not sufficient information
Naturgas Midt/Nord I/S	Senior Unsecured MTN	Not sufficient information
Nycomed A/S	LT Corporate Family Ratings	Not sufficient information
SK Power Company	Senior Unsecured	Not sufficient information

Panel D - Excluded companies from Finland

Company	Type of rating	Reason for omission
Dynea International Oy	LT Issuer Rating	No issues in SDC Platinum
Kemira Oyj	Senior Unsecured	Not sufficient information
Teollisuuden Voima Oy	Senior Unsecured	Not sufficient information

8.3 NACE-classification

TABLE 22- NACE-CLASSIFICATION OF SAMPLE COMPANIES

The table presents the sample companies and their corresponding NACE-classification. The companies are listed alphabetically, sorted by country.
Source: NACE (2012)

Panel A - NACE-classification, Norway

Company	NACE-classification	
Norsk Hydro ASA	C	Manufacturing
Norges Statsbaner AS	H	Transporting and storage
Norske Skogindustrier ASA	C	Manufacturing
Petroleum Geo-Services ASA	B	Mining and quarrying
Songa Offshore SE	B	Mining and quarrying
Statkraft SF	D	Electricity, gas, steam and air conditioning supply
Telenor ASA	J	Information and communication
Yara International ASA	C	Manufacturing

Panel B - NACE-classification, Sweden

Company	NACE-classification	
AB Volvo	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
Alfa Laval Holding AB	C	Manufacturing
Atlas Copco AB	C	Manufacturing
Electrolux AB	C	Manufacturing
Nobina AB	H	Transporting and storage
Preem Holdings AB	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
Saab AB	C	Manufacturing
SAS AB	H	Transporting and storage
Securitas AB	N	Administrative and support service activities
SKF AB	C	Manufacturing
Song Networks	J	Information and communication
Stena AB	-	Unclassified
Svenska Cellulosa Akt. SCA	C	Manufacturing
Swedish Match AB	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
TeliaSonera AB	J	Information and communication
Vattenfall AB	D	Electricity, gas, steam and air conditioning supply

Panel C - NACE-classification, Denmark

Company	NACE-classification	
Carlsberg Breweries A/S	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
DONG Energy A/S	D	Electricity, gas, steam and air conditioning supply
ISS A/S	N	Administrative and support service activities
Novo Nordisk A/S	C	Manufacturing
TDC A/S	J	Information and communication

Panel D - NACE-classification, Iceland

Company	NACE-classification	
Landsvirkjun	D	Electricity, gas, steam and air conditioning supply
Reykjavik Energy	D	Electricity, gas, steam and air conditioning supply

Panel E - NACE-classification, Finland

Company	NACE-classification	
Elisa Corporation	J	Information and communication
Fingrid Oyj	D	Electricity, gas, steam and air conditioning supply
Fortum Oyj	D	Electricity, gas, steam and air conditioning supply
Metsa Board Corporation	C	Manufacturing
Nokia Oyj	-	Unclassified
Stora Enso Oyj	C	Manufacturing
UPM-Kymmene	C	Manufacturing

8.4 Regression model with year effects

TABLE 23- YEAR EFFECTS ON DEBT STRUCTURE

Panel A comprises of the coefficients describing the year effects on different debt instruments Panel B presents the coefficients describing the relationship between year effects and different debt seniority and public/private. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations*

Panel A - Year effect on debt utilization

Instruments	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bank	-0.078	-0.150	-0.082	-0.063	-0.048	0.035	0.030	-0.008	0.011	0.015
Bonds	0.006	0.013	0.044	-0.007	0.003	-0.067	-0.082	-0.064	-0.077	-0.059
Program	-0.057	0.036	-0.016	-0.012	-0.021	-0.012	-0.023	0.002	-0.003	0.003
Mortgage	0.043	0.037	0.039	0.043	0.043	0.034	0.018	0.024	0.020	0.021
Convertible	0.017	0.004	0.000	-0.009	-0.004	0.002	0.013	0.017	0.007	0.000
Mezzanine	0.002	0.000	0.000	0.016	0.007	0.009	0.008	0.006	0.004	0.004***
Other	0.023	0.032	-0.007	-0.002	-0.006	-0.024	0.008	-0.007	0.008	-0.010

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel B - Year effect on debt seniority and public/private

Instruments	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Secured	0.074	0.045	0.060	0.090	0.099	0.098	0.064	0.065	0.090	0.095
Sen.Unsec	-0.160	-0.093	-0.069	-0.141*	-0.141*	-0.147	-0.142	-0.140	-0.168	-0.145
Subordin.	-0.009	-0.003	0.000	0.018	0.007	0.017	0.012	0.010	0.007	0.013
Public	-0.071	-0.007	-0.030	-0.052	-0.045	-0.099	-0.148	-0.089	-0.111	-0.118
Private	0.038	-0.014	0.013	0.028	0.028	0.083	0.130	0.067	0.090	0.101

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

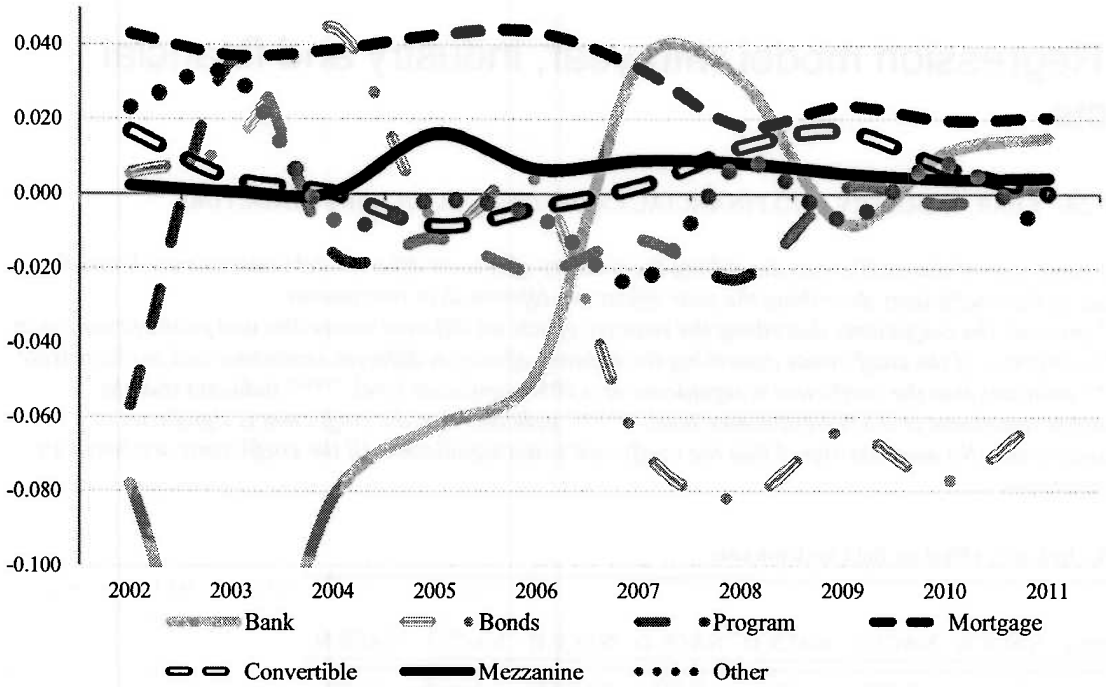

FIGURE 4 – DEVELOPMENT OF YEAR EFFECTS

Figure 4 presents changes in the year effects on different debt instruments

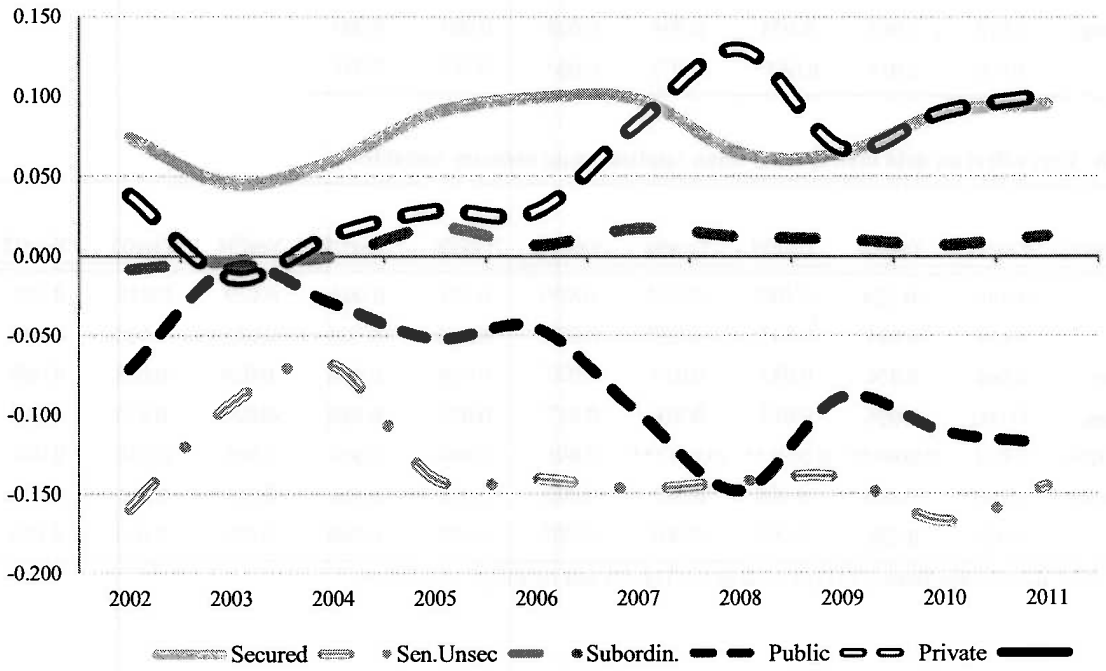

FIGURE 5 – DEVELOPMENT OF YEAR EFFECTS

Figure 5 presents changes in the year effects on different seniorities and public/private debt

8.5 Regression model with year, industry and financial effects

TABLE 24- YEAR, INDUSTRY AND FINANCIAL CRISIS EFFECTS ON DEBT STRUCTURE

Panel A comprises of the coefficients describing the industry effects on different debt instruments. Panel B comprises of the coefficients describing the year effects on different debt instruments
Panel C presents the coefficients describing the industry effects on different seniorities and public/private debt. Panel D comprises of the coefficients describing the industry effects on different seniorities and public/private debt. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations*

Panel A - Industry effect on debt instruments

Instruments	NACE B	NACE C	NACE D	NACE G	NACE H	NACE J	NACE N
Bank	0.101	-0.105	-0.122*	-0.066	-0.266***	-0.168**	-0.140*
Bonds	-0.008	0.257***	0.027	0.104*	0.011	0.001	-0.013
Program	0.125	0.061	0.346	0.230***	0.423***	0.454***	0.258***
Mortgage	-0.245***	-0.231***	-0.295***	-0.223***	-0.242***	-0.250***	-0.217***
Convertible	0.069***	-0.007	-0.017	0.001	0.000	0.012	0.061
Mezzanine	0.014	0.005	0.028	0.005	0.005	0.004	0.003
Other	-0.026	0.013	0.065*	-0.075	0.064	-0.062	0.031

Panel B -Year effect on debt instruments when implimenting industry variables

Instrumetns	Year11	Year10	Year09	Year08	Year07	Year06	Year05	Year04	Year03	Year02
Bank	-0.065	-0.154	-0.089	-0.072	-0.060	0.021	0.067	0.029	0.045	0.000
Bonds	0.008	0.024	0.043	-0.007	0.007	-0.062	-0.003	0.012	-0.004	-0.063
Program	0.001	0.074	0.035	0.039	0.027	0.039	-0.056	-0.029	-0.028	0.060
Mortgage	-0.002	0.006	0.013	0.016	0.017	0.007	-0.028	-0.022	-0.026	-0.005
Convertible	0.024	0.009***	0.007***	-0.001***	0.001	0.006	0.060	0.065	0.054	0.004
Mezzanine	-0.001	-0.003	-0.004	0.012	0.002	0.004	0.016	0.013	0.012	0.000
Other	0.025	0.036	-0.009	-0.004	-0.005	-0.022	-0.060	-0.076	-0.058	-0.006

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel C - Industry effect on seniority

Instruments	NACE B	NACE C	NACE D	NACE G	NACE H	NACE J	NACE N
Secured	0.481***	-0.183***	-0.245***	-0.044	-0.162***	-0.165***	-0.237***
Sen.Unsec	-0.495***	0.144	0.108	-0.041	-0.013	0.143	0.135
Subordin.	0.212***	0.045**	0.131***	0.085***	0.080***	0.027**	0.053
Public	0.367***	0.493***	0.376***	0.485***	0.601***	0.801***	0.130
Private	-0.348***	-0.503***	-0.351***	-0.513***	-0.614***	-0.819***	-0.142

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

Panel D - Year effect on seniority and public/private debt when implimenting industry variables

Instruments	Year11	Year10	Year09	Year08	Year07	Year06	Year05	Year04	Year03	Year02
Secured	0.058	0.010	0.032	0.057	0.051	0.045	0.039	0.040	0.056	0.038
Sen.Unsec	-0.098	-0.031	-0.012	-0.081	-0.079	-0.069	-0.084	-0.083	-0.104	-0.068
Subordin.	0.006	0.002	0.001	0.024	0.007	0.014	-0.001	-0.005	-0.010	0.010
Public	0.023	0.025	0.080	0.052	0.096	0.060	-0.008	0.040	0.035	0.022
Private	-0.031	-0.035	-0.085	-0.055	-0.101	-0.065	-0.001	-0.058	-0.044	-0.031

***,** and * denotes significance of the t-tests at the 1%, 5% and 10% level, respectively

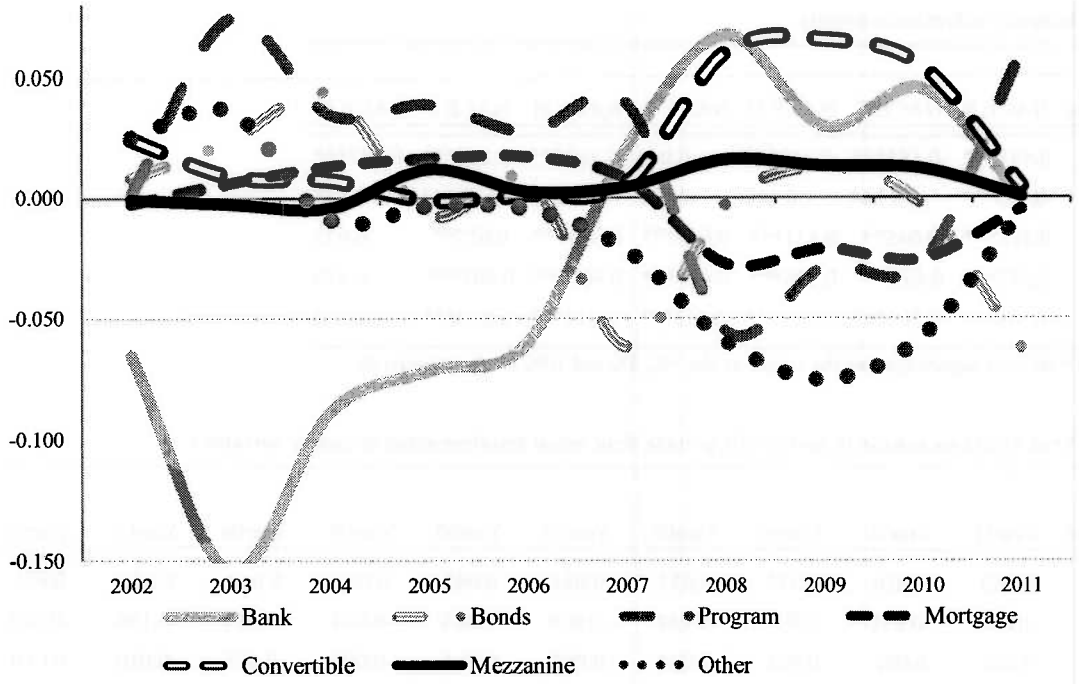

FIGURE 6 – DEVELOPMENT OF YEAR EFFECT ON DEBT

Figure 6 presents changes in the year effects on different debt instruments when industry and financial crisis are implemented as dummy variables in the regression equation

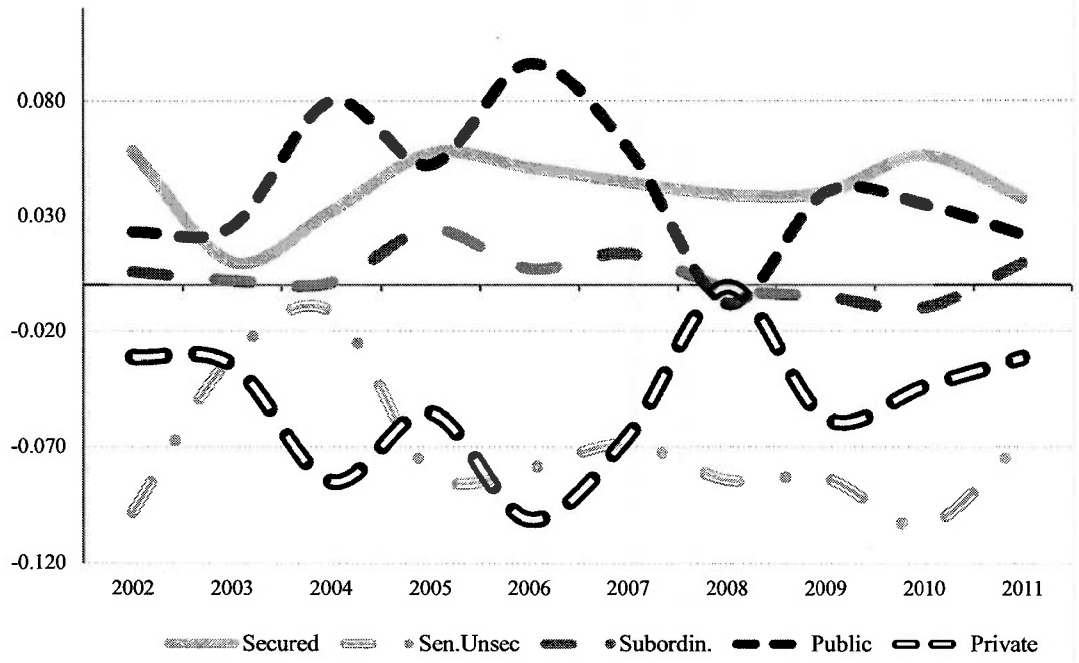

FIGURE 7 – DEVELOPMENT OF YEAR EFFECT ON DEBT

Figure 6 presents changes in the year effects on different seniorities and public/private debt when industry and financial crisis are implemented as dummy variables in the regression equation

TABLE 25- YEAR, INDUSTRY, FINANCIAL CRISIS AND COUNTRY EFFECTS ON DEBT STRUCTURE

Panel A comprises of the coefficients describing the industry effects on different debt categories. Panel B comprises of the coefficients describing the country effects on different debt categories. Panel C presents the coefficients describing the year effects on different debt categories. "" indicates that the coefficient is significant at a 10% significant level. "**" indicates that the coefficient is significant at a 5% significance level. "***" indicates that the coefficient is significant at a 1% significance level. No asterisks signal that the coefficient is not significant. All the coefficients are based on 370 observations*

Panel A - Industry effects on debt structure when including country variables

	NACE1	NACE2	NACE3	NACE4	NACE5	NACE6	NACE7
Bank	0.188	1.123*	-0.244***	-0.078	-0.233***	-0.182**	1.123**
Bonds	-0.136	0.266***	0.098*	0.154***	0.002	-0.001	0.028
Program	0.166	0.082	0.382***	0.263***	0.426***	0.487***	0.337***
Mortgage	-0.293***	-0.265***	-0.296***	-0.288***	-0.285***	-0.283***	-0.287***
Convertible	0.088***	-0.002	-0.009	0.000	0.004	0.020	0.067
Mezzanine	0.004	-0.001	0.029	-0.008	-0.001	-0.003	-0.015
Other	0.018	0.022	0.054	-0.067*	0.077*	-0.051	0.044
Secured	0.414**	-0.214***	-0.224***	-0.096***	-0.213**	-0.193***	-0.279***
Sen.Unsec	-0.513***	0.165**	0.107	0.034	0.002	0.161**	0.222***
Subordin.	0.235***	0.052***	0.147***	0.078***	0.089***	0.035*	0.048**
Public	-0.070	0.240***	0.307***	0.407***	0.345***	0.527***	0.332***
Private	0.101	-0.247***	-0.292***	-0.425***	-0.350***	-0.535***	-0.347***

Panel B - Country effects on debt structure

	Sweden	Denmark	Iceland	Finland
Bank	0.002	0.258***	0.333	0.050
Bonds	-0.156	-0.220***	-0.306	-0.017
Program	0.030	-0.231***	0.038	-0.026
Mortgage	0.052	0.148***	-0.075	-0.045
Convertible	0.030	0.000	0.008	0.009
Mezzanine	0.011	0.049***	-0.027	0.000
Other	0.027	-0.003	0.084	0.016
Secured	0.033	0.036	-0.121	-0.071**
Sen.Unsec	-0.141***	-0.285***	0.043	-0.028
Subordin.	0.050***	0.046***	-0.025	0.029**
Public	-0.242***	-0.422***	-0.183***	-0.275***
Private	0.238***	0.423***	0.228***	0.265***

Panel C - Year effects on debt structure when including country variables

	Year11	Year10	Year09	Year08	Year07	Year06	Year05	Year04	Year03	Year02
Bank	0.020	0.082	0.071	0.107	0.039	-0.039	-0.040	-0.060	-0.131	-0.043
Bonds	-0.067	-0.027	-0.017	-0.029	-0.067	-0.001	-0.026	0.029	0.017	0.000
Program	0.050	-0.019	-0.020	-0.046	0.032	0.020	0.027	0.022	0.066	-0.007
Mortgage	-0.010	-0.050**	-0.046	-0.054**	0.001	0.011	0.014	0.010	0.001	-0.007
Convertible	0.003	0.055	0.067***	1.123***	0.005***	0.001	-0.001	0.006	0.007	0.023
Mezzanine	0.000	0.006	0.007	0.009	0.004	0.002	0.012	-0.004	-0.003	-0.001
Other	-0.005	-0.046	-0.063	-0.047	-0.020	-0.002	0.001	-0.006	0.038	0.027
Secured	0.027	0.027	0.010	0.008	0.033	0.040	0.047	0.022	0.001	0.049
Sen.Unsec	-0.067	-0.085	-0.066	-0.065	-0.068	-0.079	-0.087	-0.017	-0.027	-0.095
Subordin.	0.009	-0.012	-0.007	-0.004	0.014	0.007	0.024	0.002	-0.001	0.004
Public	-0.057	-0.111	-0.093	-0.151*	-0.057	-0.008	-0.020	0.003	0.035	-0.019
Private	0.051	0.112	0.093	0.155	0.054	0.004	0.010	-0.005	-0.038	0.015

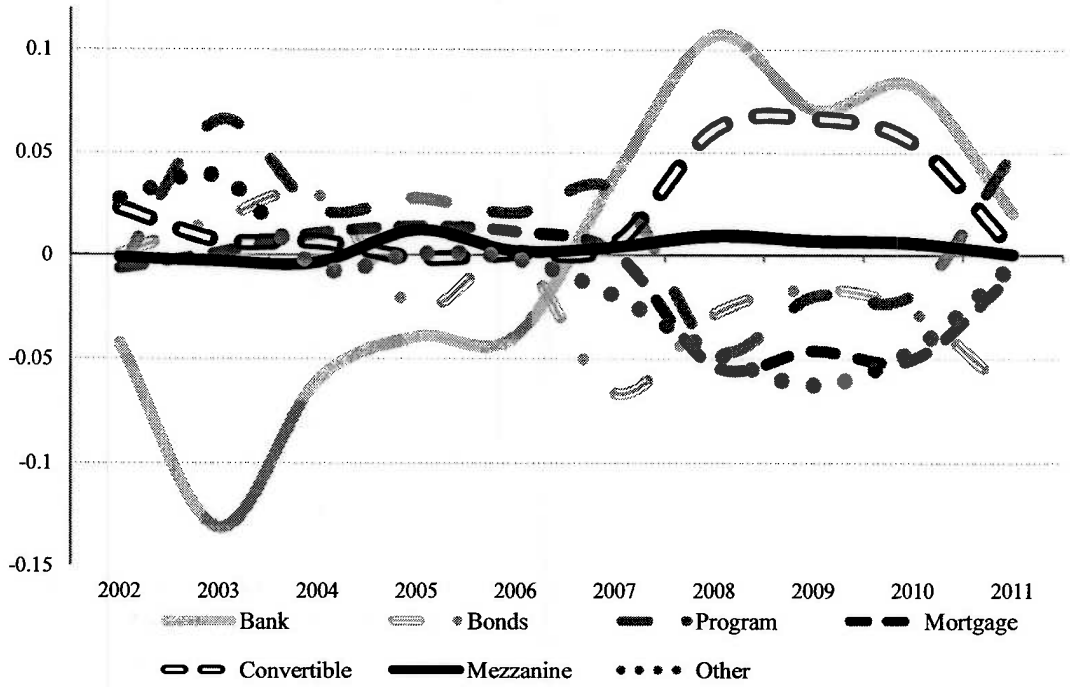

FIGURE 8 – DEVELOPMENT OF YEAR EFFECTS ON DEBT STRUCTURE

Figure 8 presents changes in the year effects on different debt instruments when industry, financial crisis and country are implemented as dummy variables in the regression equation

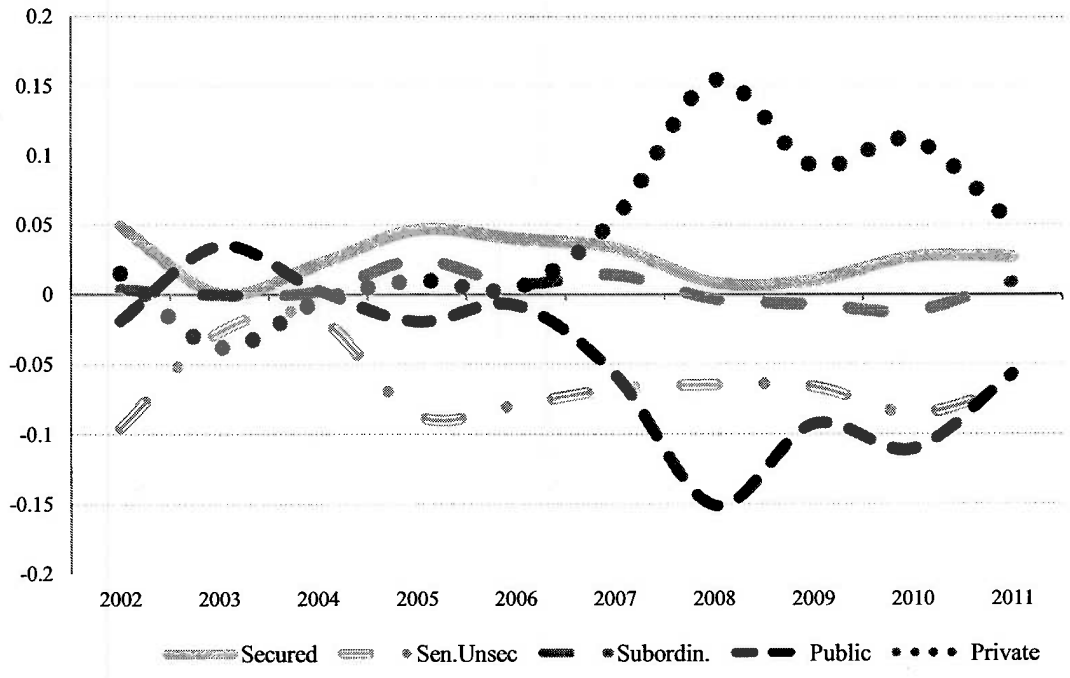

FIGURE 9 – DEVELOPMENT OF YEAR EFFECTS ON DEBT STRUCTURE

Figure 9 presents changes in the year effects on different debt seniority and public/private debt when industry, financial crisis and country are implemented as dummy variables in the regression equation