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Debt Specialization In The Nordic

Master Thesis

by
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MSc in Finance and MSc in Business with Major Finance

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ABSTRACT

This paper presents a comprehensive comparative analysis of the Nordic public debt market and the U.S. public debt market. By examining key firm characteristics that help explain trends in debt specialization, we provide insights into the similarities and differences between these debt markets. Through a quantitative analysis of historical data we discover these contrasts and disclose possible economic reasons for them. In turn, this paper shows that research on debt specialization in the U.S. is not universally correct outside the U.S. Hence, this paper further delve into country and industry specific sections to uncover how debt specialization appears in the Nordic. We conclude that the debt specialization within the Nordic at all levels shows preference to term loans opposed to the American preference for Bonds & Notes, possibly explained by market structure and size differences.

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Acronyms

AER Arts, Entertainment, and Recreation. 14, 36–40, 44, 45, 47–50

AFFH Agriculture, Forestry, Fishing and Hunting. 36–39, 44, 45, 47–50

AFS Accommodation and Food Services. 36–39, 44, 45, 47–50

ASWS Administrative and Support and Waste Services. 36–38, 40, 44, 45, 47–50

BN Bonds & Notes. 2, 14, 17, 20, 21, 29, 30, 36, 37, 45, 46, 50–52

CL Capital Leases. 12, 14, 17, 20, 21, 29–31, 36, 37, 45–52

CON Construction. 36, 37, 44, 45, 47–50

CP Commercial Paper. 12, 14, 17, 20, 21, 29–31, 36, 37, 45–52

DS90 Debt Specialization over 90%. 6, 7, 14, 15, 23, 25, 26, 45, 46

ES Educational Services. 14, 36, 45

HCSA Health Care and Social Assistance. 36–39, 44, 45, 47–50

HHI Herfindahl-Hirschman Index. 6, 7, 14, 15, 17, 23, 24, 26, 29, 32, 36, 44–46

INF Information. 14, 36–39, 44, 45, 47–50

MAN Manufacturing. 14, 36–38, 44, 45, 47–50

MCE Management of Companies and Enterprises. 14, 36, 45

MIN Mining. 14, 36–39, 44, 45, 47–50

OB Other Borrowings. 12, 14, 17, 20, 21, 29, 30, 36, 37, 45–52

OS Other Services. 14, 36, 45

PSTS Professional, Scientific, and Technical Services. 14, 36–40, 44, 45, 47–50

RC Revolving Credit. 12, 14, 17, 20, 21, 29, 30, 36, 37, 45–52

RT Retail Trade. 36–38, 40, 44, 45, 47–50

TL Term Loans. 2, 14, 17, 20, 21, 29, 30, 36, 37, 45–52

TW Transportation and Warehousing. 14, 36, 37, 39, 44, 45, 47–50

WT Wholesale Trade. 36, 38, 44, 45, 47–50

1 Introduction

Extensive research has been conducted on capital structure, ranging from Modigliani & Miller's propositions to the trade-off theory and the pecking order theory. In recent years, there has been a transition in research towards debt structure. It is apparent that the research has come a long way, however, one commonality to the major contributors of debt structure theory is that the research is conducted or derived from the U.S. which is traditionally characterised by bond-based lending. To broaden our understanding, there is a clear need for further research conducted outside the U.S., particularly in bank-based markets.

Bank-based financing has historically played a prominent role in the Nordic countries' financial systems, with banks serving as the primary source of financing for businesses and households (Berglund & Mäkinen, 2019). The Nordic banks, comprising Sweden, Norway, Denmark, and Finland, have a tradition for relationship banking, where they establish long-term partnerships with clients and provide customized financing solutions (Laeven & Valencia, 2012). This approach allows banks to have a deep understanding of borrowers' needs and tailor their lending practices accordingly. Banks assess the creditworthiness of borrowers through comprehensive analyses of financial statements, collateral, industry prospects, and risk assessment (Anginer et al., 2017). Nordic banks are also active participants in syndicated loans and project financing, collaborating with international counterparts to provide funding for large-scale projects. This allows them to diversify risks and participate in financing arrangements that go beyond their individual capacity. While bank-based financing remains prominent in the Nordic countries, alternative financing sources and capital markets have gained increased significance in recent years (Bats & Houben, 2020). This includes the growth of bond markets, private equity, venture capital, and crowdfunding, providing additional financing options for businesses (Hildebrand et al., 2017).

Bank-based financing plays a significant role in the American financial system, but the United States has a more diversified financing landscape compared to the Nordic countries. While banks are important providers of financing, the American public market, consisting of capital markets and securities exchanges, plays a crucial role in facilitating corporate financing and capital formation (Levine, 1999).

The American Bond market is the most liquid bond market in the world. Bonds & Notes (BN) are thus not surprisingly, the most utilized debt for American public companies with Term Loans (TL) second (Colla et al., 2013).

Recent studies by Rauh and Sufi (2010) and Colla et al. (2013) confirms this, and also shows that the research focus has shifted towards investigating debt determinants and more specialized subjects like debt heterogeneity and debt specialization. To expand on Colla et al. (2013) we want to see how debt specialization in a bank-based market relate to their findings, thus we decided to research the Nordic public debt market. Our thesis will therefore analyze the determinants that affect Nordic debt structure. Furthermore, existing research provides limited insights into industry-specific debt specialization. Consequently, we are intrigued to explore this aspect as part of our study. By examining industry-specific debt dynamics, we aim to contribute to the current literature and gain insights into the distinct patterns and determinants of debt specialization within different sectors in the Nordic region. Therefore, this paper seeks to answer the following research problem:

How is debt specialization and debt structure in the Nordic public market compared to the U.S. public market?

After comparing debt specialization and debt structure in the Nordic public market with that of the U.S. public market, it becomes possible to delve deeper into country-specific and industry-specific levels of analysis. While the initial comparison provides a broad understanding of the overall differences and similarities between the two regions, narrowing the focus to specific countries within the Nordic region and multiple industries enables a more comprehensive examination of the factors influencing debt specialization and debt structure in the Nordic. By conducting such analysis, a clearer picture can be formed regarding the unique firm characteristics, regulatory frameworks, economic conditions, and industry dynamics that shape the debt profiles of companies operating within these distinct contexts. We thus, aim to answer the following secondary questions:

How do the Nordic countries compare to each other on debt specialization and debt structure?

How do the industries in the Nordic compare to each other on debt specialization and debt structure?

2 Literature review

The subject of debt structurization of a firm derives from capital structure. Modigliani and Miller (1963) and Modigliani and Miller (1958) introduced the capital structure irrelevance proposition, which laid the foundation for the modern theories by establishing that firm earnings depend on the firm risk, rather than the capital proportion of debt and equity. Further, many researchers have attributed, for instance Jensen (1986), which examines and lays out how capital structure choices depend on agency costs, related to free cash flows. Gordon and Halpern (1974) introduced the concept of target capital structure based on firms' investment policy. Similarly, Ferber (1967) delves into the relationship between cost of capital and firm's investment opportunities, dividend policy, and capital structure choices. The costs related to capital has been investigated for many decades now with some of the most influential contributions being Fama and French (2002), which presented a comprehensive analysis of the cost of capital and its relationship to corporate finance decisions and investment theory. They discuss the trade-off between the benefits and costs of debt and equity financing, and the impact of these financing choices on the firm's cost of capital. They also examine the implications of the cost of capital for investment decisions, highlighting the importance of considering the systematic risk of investments.

Research in the field of finance up to this point formed particularly two theories that stand out as essential. Together, these theories have provided valuable insights into the complex dynamics of corporate financing decisions and guiding firms in their capital structure choices.

2.1 Trade-Off Theory

The first one, trade-off theory, is a financial concept that highlights the trade-offs a company faces when making financial decisions, aiming to achieve an optimal capital structure by balancing the benefits and costs of different financing sources. Companies can choose between debt and equity financing, each with its own advantages and disadvantages (Kraus & Litzenberger, 1973).

On one hand, debt financing offers the advantage of tax deductibility on interest payments and allows the company to leverage its operations by using borrowed

funds. However, it also brings financial risk as the company becomes obligated to make regular interest and principal payments, which can strain its cash flow. Additionally, taking on excessive debt can increase the company's financial risk and make it more vulnerable to economic downturns (Myers, 1984).

On the other hand, equity financing provides funds without the obligation of regular interest or principal payments. It allows the company to share its risks and rewards with investors, along with the downside that issuing equity dilutes ownership and control (Kraus & Litzenberger, 1973).

2.2 Pecking Order Theory

The second one, Pecking Order Theory, is a financial theory that explains how companies prioritize the sources of financing they use to fund their operations and investments initially proposed by Myers (1984). The theory states that firms have a preferred order in which they seek to finance their operations and investments, starting with the least expensive source and moving to more expensive sources as needed. The pecking order theory argues that firms first turn to internal financing sources, such as retained earnings, before seeking external financing. Internal financing is generally less expensive and less risky than external financing because it does not require the firm to pay interest, face potential dilution of ownership, or issue new securities (Myers, 1984). In short, internal financing helps the firm maintain control over its operations and investment decisions.

External financing, on the other hand, is more expensive and riskier. According to the pecking order theory, only when debt becomes too expensive or unavailable will firms resort to issuing equity to finance their operations and investments. Hence, equity is considered the last resort of financing by firms and is referred to as the "bottom of the pecking order" (Myers & Majluf, 1984).

Empirical studies have shown that the pecking order theory provides a good description of how firms actually behave in their financing decisions. For instance, a study by Rajan and Zingales (1995) found evidence that firms prioritize internal financing over external financing and prefer debt over equity when seeking external financing. Other studies have also found that firms exhibit a clear preference for debt over equity, as well as a clear preference for long-term debt over short-term debt (Myers & Majluf, 1984).

2.3 Debt Heterogeneity

Debt heterogeneity refers to the diversity or variations in the characteristics and terms of debt instruments issued by companies. It recognizes that different firms have different financial needs, risk profiles, and borrowing capacities, resulting in a range of debt options available in the market. The heterogeneity should thus explain each unique firm's tailored debt profile, either specialized in one debt type or a diversification of multiple.

The tight connection between capital structure and debt structure entails that one field influences the other, thus, it's natural that researchers have been probed into both fields coherently. Debt structure theory has had major contributors including research on the choice of debt maturity. Barclay and Smith (1995) investigated the determinants of debt maturity and found that firms with higher growth opportunities and more tangible assets tend to issue longer-term debt. They further add insight into capital structure determinants with their paper "The Capital Structure Puzzle: Another Look at the Evidence," where they append to their previous finding that factors such as firm size, profitability, and industry characteristics can influence capital structure decisions (Barclay & Smith, 1999).

Furthermore, the groundbreaking paper "Capital Structure and Debt Structure" by Rauh and Sufi (2010) analyze how various factors, such as firm size, profitability, growth opportunities, and industry characteristics, influence the choice of debt type and debt maturity of publicly traded U.S. firms. This paper delved into the subject of debt heterogeneity, which in turn Colla et al. (2013) further examined on a larger scale sample size, uncovering that only low risk, large firms with high profitability, low growth opportunities, and high leverage borrow through multiple debt types in conformity with findings from Bolton and Scharfstein (1996). A more recent study "Debt specialization and performance of European firms" by Giannetti (2019) finds that firms with higher debt specialization tend to have better operating performance, higher profitability, and lower bankruptcy risk. Furthermore, the research suggests that this positive relationship is particularly significant for firms that rely on relationship-based lending and have a high level of information asymmetry.

3 Methodology

The research will be conducted with a quantitative approach. The objective of our research is to conduct an explanatory study that explores the relationship between various forms of debt and firm characteristics by utilizing secondary data. We employ statistical techniques to investigate these relationships, which will be further elucidated in the subsequent sections. The statistical analyses are conducted using the Python programming language. By utilizing secondary data, we gain the advantage of accessing longer time horizons, enabling us to examine the data over an extended period.

3.1 Econometric Model

$$\begin{aligned} Y_i = \beta_0 + \beta_1 X_{it} + \gamma_2 D2_i + \ldots + \gamma_n Dn_i + C_2 D2_i + \ldots + C_n Dn_i \\ + l_2 D2_i + \ldots + l_n Dn_i + u_i \end{aligned} \tag{1}$$

$$\begin{aligned} HHI = \beta_0 + \beta_1\ Size + \beta_2\ Prof + \beta_3\ M/B + \beta_4\ Tan + \beta_5\ CF \\ + \beta_6\ BL + \beta_7\ Adv + \gamma_n + C_n + l_n + u_i \end{aligned} \tag{2}$$

$$\begin{aligned} DS90 = \beta_0 + \beta_1\ Size + \beta_2\ Prof + \beta_3\ M/B + \beta_4\ Tan + \beta_5\ CF \\ + \beta_6\ BL + \beta_7\ Adv + \gamma_n + C_n + l_n + u_i \end{aligned} \tag{3}$$

Where:

γ_n = Year Fixed Effects

C_n = Country Fixed Effects

l_n = Industry Fixed Effects

Equation (1) is the multivariate regression model we use in our analysis which includes all the independent variables X_i for $_t$ firms and the respective dummies represented by the different fixed effects. Equation (2) is for the dependent debt specialization variable HHI explained in 3.2.1. It includes the independent variables and dummy variables outlined in section 3.3. Equation (3) for Debt Specialization over 90% (DS90) explained in 3.2.2, is the regression model for concentrated debt specialization outlined by the same independent variables.

3.2 Dependent Variables

3.2.1 Herfindahl-Hirschman Index

The Herfindahl-Hirschman Index (HHI) is typically used to compute market specialization, but as in Colla et al. (2013), we use it to compute the specialization of debt used by each company. The calculation of the index starts with the calculation of the equation:

$$SS_{i,t} = \sum_{n}^{i=1} \left(\frac{Debt\ Type_{i,t}}{Total\ Capital_{i,t}} \right)^2 \tag{4}$$

$$HHI_{i,t} = \frac{SS_{i,t} - 1/n}{1 - 1/n} \tag{5}$$

Equation (4) is the squared sum of each debt type divided by the total capital of the firm for each period. Equation (5) concludes the calculation of the HHI measure by utilizing $SS_(i,t)$ and the quantity of debts, n. If the firm uses only one type of debt, the HHI index will be equal to one. If, however, the firm uses all types of debt in equal proportion, the index would be zero. The HHI then becomes a measure to check whether the company specializes in its debt or whether it diversifies its external sources of financing.

3.2.2 DS90

As an alternative measure of debt specialization to HHI, we define debt DS90, which indicates firms with more than 90 percent of a singular debt type to total debt ratio. $DS90$ is a dummy variable defined as:

$$\begin{aligned} &DS90 = 1 \quad \text{if a firm obtains at least 90\% of its debt from one debt type} \\ &DS90 = 0 \quad \text{otherwise} \end{aligned} \tag{6}$$

3.3 Independent Variables

To investigate the relationship between firm-specific measures and debt structure we have used several proxy variables. We have included the variables that we

believe have a significant impact on the choice of debt structure, based on our preliminary analyses and findings from previous research. In this section, the following variables are described.

3.3.1 Size

Size can be evaluated using two metrics: assets or sales (Li et al., 2014). Titman and Wessels (1988) contend that the choice of metric does not impact the parameter estimate of their structural model. However, in the case of the regression model employed in this study, the natural logarithm of total assets (Leary, 2009) is adopted as a measure of size. This decision is based on the consideration that while the volume of sales may experience rapid fluctuations, the value of assets tends to remain relatively stable over time.

3.3.2 Profitability

Profitability is commonly defined as the ratio of operating profit to total assets, representing the company's ability to generate profits from its assets. One advantage of using operating profit as a measure is that it is not influenced by the choice of financing. In the research conducted by Colla et al. (2013) and Rajan and Zingales (1994), operating profit before depreciation is utilized, while Rauh and Sufi (2010) use operating profit after depreciation. In this study, we have opted to employ operating profit before depreciation to minimize reliance on specific accounting standards.

3.3.3 Market to Book

Market-to-Book (M/B) ratio is determined by dividing the market value of equity by the book value of equity and is frequently employed as an indicator of a company's growth opportunities. It is worth noting that using the M/B ratio as a proxy for growth opportunities has faced criticism, as firms with appreciating asset values may exhibit a high M/B ratio without necessarily indicating significant growth prospects (Harris & Raviv, 1991). However, Adam and Goyal (2008) argue that the M/B ratio remains the most effective measure for capturing future growth opportunities, which is why we choose M/B as our proxy for future growth opportunities.

3.3.4 Tangibility

Tangibility refers to the ratio of total Property, Plant, and Equipment (PPE) to total assets, providing an indication of the tangible nature of a firm's assets. This measure holds significance as it determines the collateral a firm can offer when seeking loans. According to Frank and Goyal (2009), greater tangibility simplifies asset valuation, thereby reducing expected bankruptcy costs.

3.3.5 Cash Flow Volatility

Cash flow volatility refers to the variability or fluctuations in a firm's cash flows over a given period. We define CF Volatility as the standard deviation of the past 4 periods of the operating profit before non-recurring income/expense divided by total assets. This measure is important as it reflects the uncertainty and instability in the company's cash inflows and outflows. Minton and Schrand (1999) find that higher cash flow volatility is linked to reduced investment in capital expenditures, R&D, and advertising. This implies that firms may permanently forgo investment rather than relying on external capital markets to cover cash flow shortfalls. Moreover, cash flow volatility is associated with higher costs of accessing external capital, amplifying the sensitivity of investment to cash flow fluctuations. Consequently, cash flow volatility not only raises the likelihood of firms needing to access capital markets but also increases the associated costs.

3.3.6 Book Leverage

Book leverage is defined as the ratio of a company's total debt to its total assets, serving as a measure of the extent to which a company is financed by debt. This metric carries importance as it reflects the level of financial leverage employed by the firm and the proportion of its assets that are funded through debt. According to research by Lemmon et al. (2008), higher book leverage can have implications such as increased financial risk and potential difficulties in debt repayment. A low Book Leverage thus serves as a proxy for conservative firms with stable outlooks and a higher book leverage could imply that the firm is leveraging its resources to maximize growth opportunities or expand its operations, potentially signaling a positive economic outlook.

3.3.7 Dividend Payer

Dividend payer is a binary variable that takes a value of 1 if the company distributes dividends and 0 if it does not. According to Frank and Goyal (2009), dividend-paying firms tend to have lower leverage ratios compared to non-dividend-paying firms, which aligns with the pecking order theory suggesting that dividends can indicate excess free cash flow available for internal financing. Additionally, Drobetz et al. (2012) highlight that dividend payments can mitigate information asymmetry, thereby contributing to the negative correlation observed between dividends and leverage. These dividend payments signal higher quality and subsequently reduce the cost of equity issuance relative to debt issuance (Gropp & Heider, 2009).

3.3.8 Advertising

Advertising plays a crucial role in promoting a company's products or services to its target market, aiming to increase brand awareness, customer reach, and market share. The level of investment in advertising is measured by the ratio of advertising expenses to total assets. Research conducted by Singh et al. (2005) highlights a relationship between a firm's advertising expenditure and the market-imposed weighted average cost of capital. Higher advertising expenditure is associated with a lower cost of equity, increased debt utilization, and a reduced weighted average cost of capital. Furthermore, firms that allocate more resources to advertising tend to experience higher market value added, indicating the potential for improved performance.

3.4 Null and Alternative Hypothesis

The null hypothesis states that there are no significant predictors for the independent variables to explain debt specialization. The alternative hypothesis states that if one or more predictors are non-equal to zero, the null hypothesis must be rejected. This is valid if the results are significant at the 90%, 95% or 99% level, indicated by *, ** and *** respectively.

$$\begin{aligned} H_0 &: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0 \\ H_A &: \text{At least one } \beta \text{ is nonzero} \end{aligned} \tag{7}$$

3.5 Multicollinearity

To minimize the issue of multicollinearity we analyzed the correlation matrix to ensure no pair-vise variables exceeded the correlation limit of becoming highly collinear. We define highly collinear as being 70% or more correlated in accordance with Brooks (2019).

3.6 Autocorrelation

Time series is present in the data, therefore, a Breusch Godfrey test will be conducted to determine whether the model's idiosyncratic error term exhibits significant serial correlation. Equation (8) shows the null and alternative hypothesis for the Breusch Godfrey test, where ρ is correlation. and $_i$ is firms. To further circumvent potential autocorrelation, we lag the dependent variables in our regressions.

$$\begin{aligned} H_o &: \rho_i = 0 \text{ for all } i \\ H_A &: \rho_i \neq 0 \text{ for all } i \end{aligned} \tag{8}$$

3.7 Homoscedasticity

To ensure the unbiased and efficient error terms we use White's test to check for heteroscedasticity. Given proof of heteroscedasticity robust standard errors will be deployed. Equation (9) shows the null and alternative hypothesis for the White's test, where σ_i^2 is the variance of the error terms, and $_i$ is firms.

$$\begin{aligned} H_0 &: \sigma_i^2 = \sigma^2 \text{ for all } i \\ H_A &: \sigma_i^2 \neq \sigma^2 \text{ for all } i \end{aligned} \tag{9}$$

4 Data

In this section, the data sample and the data-gathering process used in the study is described. The data collection for this study has been a two-step process. First, public companies in Norway, Sweden, Denmark, and Finland were identified. Second, we compiled identifying data, firm characteristics, and debt data for these companies from Capital IQ, Compustat, and Refinitiv.

4.1 Sample Collection

From Compustat, 2,693 unique ISIN, and GVKEYS for the Nordic companies in the period 2001-2021 were identified. Using these codes, relevant identifying and firm characteristics data were extracted from the Refinitiv database on a fiscal-year basis, totaling 22,835 firm-year observations. From the Capital IQ database, detailed debt information distributed on term loans, bonds & notes, Revolving Credit (RC), Capital Leases (CL), Commercial Paper (CP), Other Borrowings (OB), and trust preferred were extracted on a quarterly basis with 243,278 firm-year observations.

4.2 Data Cleaning

Several filters were applied to refine and create a suitable framework for the study. It was essential to ensure the comparability of the datasets in terms of reported data. Therefore, each dataset was filtered individually, assuring consistency before merging them. The initial filter entailed exclusively utilizing Capital IQ data for the fourth quarter, followed by the removal of the non-most recent financial instance reports to avoid duplicates. The trust-preferred debt type only contained two observations in the dataset, therefore we concluded to merge this debt into other borrowings. The resulting dataset from Capital IQ exhibited 94,077 firm-year observations.

Next, we excluded utilities (NAICS code 22), financials & insurance (NAICS code 52), and real estate & leasing (NAICS code 53) from the Refinitiv dataset due to abnormal reporting incentives. As a result, the Refinitiv dataset was reduced to a total of 18,746 firm-year observations. Furthermore, dual listing duplicates were filtered away by removing the foreign observation of their current exchange,

leaving the Refinitiv dataset with 18,481 firm-year observations.

Finally, The Capital IQ and Refinitiv datasets were merged based on GVKEY and year, excluding all non-present observations in both datasets. This resulted in a final dataset containing 11,636 firm-year observations. This combined dataset became the foundation for all conducted analyses throughout the thesis.

In certain analysis,' we conducted further data cleaning to facilitate regressions. This involved restricting the presence of extreme value disparities between factors to ensure that significant factors were not mistakenly considered insignificant. Thus, for the multivariate analysis and the country-specific analysis, we winsorize the firm characteristics M/B, profitability, tangibility, CF volatility, book leverage, and advertising at the 1st and 99th percentile. However, for size, we instead apply natural logarithm.

4.3 Summary Statistics

This panel provides summary statistics for the Nordic combined. The index variables are the firm characteristics examined in this paper. Included for each firm characteristic are the mean, median, standard deviation, 5%-quantile, 95%-quantile, minimum, and max values. Before resulting in this table, winsorization and natural logarithm was applied as explained in 4.2.

Table 1: Summary Statistics
This table shows the summary statistics for the independent variables explained in section 3.3. The respective mean, median, standard deviation, 25%-quantile, 75%-quantile, minimum, and max values for each variable are reported.

	Mean	Median	SE	25% Lowest	75% Highest	Min	Max
ln Size	18.9565	18.8941	2.3071	17.3363	20.6048	10.0567	25.7145
ln Sales	18.3452	18.7887	3.6164	17.0312	20.4838	0.0000	25.5146
M/B	1.5112	0.8557	2.0135	0.4595	1.6457	0.0567	12.8299
Profitability	-0.0061	0.0489	0.2250	-0.0240	0.0986	-1.1291	0.3957
Dividend Payer	0.4770	0.0000	0.4995	0.0000	1.0000	0.0000	1.0000
CF Volatility	0.0864	0.0342	0.1758	0.0156	0.0766	0.0000	1.3207
Tangibility	0.2184	0.1307	0.2347	0.0357	0.3262	-0.0050	0.9453
Book Leverage	0.2356	0.2087	0.1831	0.0886	0.3420	0.0000	0.8764
Market Leverage	0.4166	0.2742	0.3786	0.0854	0.8387	0.0000	1.0000
Advertising	0.3329	0.2375	0.3246	0.1234	0.4238	0.0000	1.7906

Notably, the M/B and tangibility variables exhibit considerable disparities, with their high maximum values relative to their respective means and medians. The sizable standard errors suggest the presence of substantial cross-sectional variations which we uncover further.

Based on the country statistic in table 15 in the Appendix, it is evident that Sweden has the highest number of observations, while Denmark has the lowest representation. From the t-test comparing the countries in Table 16 in the Appendix, we find significant differences in 2/3 of the results and non-significance for the remaining 1/3. Examining the industry statistics in table 17 in Appendix, we observe that the Manufacturing (MAN) industry exhibits the highest number of observations, followed by Professional, Scientific, and Technical Services (PSTS) and Information (INF). Conversely, industries Other Services (OS), Educational Services (ES), and Management of Companies and Enterprises (MCE) display the fewest observations. Additionally, the statistics reveal the distribution of sectors among the four countries in Table 18 in the appendix. Unsurprisingly, Sweden generally holds a high percentage overall. We notice that Norway has a high percentage in sectors Mining (MIN), Transportation and Warehousing (TW), and Arts, Entertainment, and Recreation (AER). In contrast, Denmark and Finland do not dominate any sector with a significantly high number of observations.

4.4 Time-Varying Debt Specialization

To reveal potential differences in annual debt specialization, we have created a table that shows the percentage development of each debt type, HHI, and DS90 for our sample period.

Table 2: Annual Debt Specialization
This table shows the yearly average of each debt type to total debt, the HHI and DS90.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
TL	0.65	0.62	0.62	0.59	0.60	0.58	0.57	0.58	0.57	0.56	0.55	0.54	0.53	0.52	0.54	0.53	0.52	0.51	0.42	0.40	0.35
BN	0.09	0.10	0.11	0.11	0.11	0.11	0.12	0.10	0.10	0.10	0.10	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.09	0.09	0.09
RC	0.10	0.11	0.10	0.11	0.11	0.13	0.14	0.19	0.21	0.22	0.23	0.23	0.23	0.24	0.23	0.24	0.24	0.24	0.16	0.17	0.20
OB	0.12	0.13	0.12	0.11	0.08	0.07	0.06	0.05	0.04	0.05	0.04	0.03	0.03	0.04	0.04	0.03	0.04	0.04	0.03	0.03	0.04
CL	0.04	0.04	0.04	0.08	0.08	0.08	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.29	0.29	0.28
CP	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04
HHI	0.76	0.77	0.78	0.73	0.72	0.72	0.71	0.71	0.70	0.69	0.70	0.70	0.69	0.70	0.71	0.71	0.71	0.70	0.63	0.63	0.55
DS90	0.55	0.56	0.60	0.52	0.49	0.47	0.48	0.46	0.48	0.46	0.45	0.44	0.44	0.46	0.48	0.49	0.48	0.47	0.37	0.36	0.25

Table 2 reveals fluctuations in debt types and debt specialization measures over the 21-year period in the data set. Notably, there is a decline in HHI and DS90

after 2018, followed by another decline in 2021. Term loans have exhibited a gradual decline each year, with a steeper decrease observed from 2018 onwards. Bonds & Notes, on the other hand, have experienced a slight decline since 2014. Revolving credit has shown an overall increase over the time period, although there was a decline in 2018. capital lease, in contrast, have seen a sharp increase starting from 2019.

To investigate if this trend is consistent across countries, a country-specific analysis was conducted. The results from table 19, 20, 21 and 22 in Appendix demonstrate that all countries experienced a decline in HHI and DS90 from 2018, while only Norway and Sweden showed a decline from 2021 onwards.

4.5 Correlation

Table 3: Correlation
The table presents the correlation between all variables. Definitions of the variables can be found in section 3.3

	ln Size	ln Sales	M/B	Profitability	Dividend Payer	Tangibility	CF Volatility	Book Leverage	Market Leverage	Advertising	HHI	DS90
ln Size	1.0000	0.7476	-0.0606	0.3154	0.5918	0.2701	-0.0874	-0.0240	-0.1499	-0.3051	-0.3652	-0.3026
ln Sales	0.7476	1.0000	-0.0668	0.3507	0.5230	0.1675	-0.0638	-0.0519	-0.2248	-0.0888	-0.3495	-0.3042
M/B	-0.0606	-0.0668	1.0000	-0.0464	-0.0348	-0.0230	0.0094	0.0791	-0.0223	0.0302	0.0254	0.0284
Profitability	0.3154	0.3507	-0.0464	1.0000	0.2438	0.0633	-0.0140	-0.5404	-0.1107	-0.3712	-0.0977	-0.0908
Dividend Payer	0.5918	0.5230	-0.0348	0.2438	1.0000	0.0622	-0.0362	-0.0253	-0.1825	-0.0733	-0.1991	-0.1517
Tangibility	0.2701	0.1675	-0.0230	0.0633	0.0622	1.0000	-0.0194	0.0636	0.0024	-0.1791	-0.0851	-0.0763
CF Volatility	-0.0874	-0.0638	0.0094	-0.0140	-0.0362	-0.0194	1.0000	0.0608	0.0058	0.0144	0.0343	0.0336
Book Leverage	-0.0240	-0.0519	0.0791	-0.5404	-0.0253	0.0636	0.0608	1.0000	0.0396	0.3194	-0.0264	-0.0299
Market Leverage	-0.1499	-0.2248	-0.0223	-0.1107	-0.1825	0.0024	0.0058	0.0396	1.0000	-0.0965	0.0116	-0.0090
Advertising	-0.3051	-0.0888	0.0302	-0.3712	-0.0733	-0.1791	0.0144	0.3194	-0.0965	1.0000	0.0849	0.0693
HHI	-0.3652	-0.3495	0.0254	-0.0977	-0.1991	-0.0851	0.0343	-0.0264	0.0116	0.0849	1.0000	0.8890
DS90	-0.3026	-0.3042	0.0284	-0.0908	-0.1517	-0.0763	0.0336	-0.0299	-0.0090	0.0693	0.8890	1.0000

As seen in table 3, M/B, profitability, cash flow volatility, and advertising expenses, are positively correlated with the debt specialization measures HHI and DS90. Moreover, firm size, sales, dividend payer, tangibility, and book leverage are negatively correlated with HHI and DS90. Consistent with expectations, a highly positive correlation is observed between HHI and DS90. However, since both are dependent variables employed in separate regression models, this correlation does not pose a concern. Additionally, the variables ln size and ln sales display a high degree of correlation. For future analysis, only one of these independent variables will be included in the regression model. This approach will mitigate the issue of multicollinearity, enhance the interpretability of the results,

and enable a more precise examination of the individual impact of the selected parameter on the dependent variable.

5 Results and analysis

This section is structured into three parts. First, an analysis of the Nordic region, comparing our findings with those of Colla et al. (2013). The second part consist of country-level analysis, comparing the Nordic countries in relation to each other. The final part entails an industry-level analysis.

5.1 Nordic Market

In the first section, our focus is on assessing the level of debt specialization in the Nordic region and examining the debt distribution patterns. By examining the summary statistics in table 1 and comparing it to the summary statistic provided by Colla et al. (2013) we find some differences in the values. Our objective is to explore a potential relationships between the firm characteristic and their preferences for specific debt structures in the Nordic region and compare them to the findings in Colla et al. (2013).

5.1.1 Cluster Analysis

Our first piece of evidence on debt specialization comes from cluster analysis. This technique, commonly used to discover unknown structures in data, relies on the minimization of the variance within clusters (in terms of the Euclidian distance of a firm-year observation from the center of its own cluster) and the maximization of the variance between clusters (in terms of the Euclidian distance of a firm-year observation from the center of other clusters). The sample ended up with six clusters for our sample firms. Figure 1 presents the distribution of different debt types within each cluster using mean ratios.

Figure 1: Distribution of Debt Types Within Clusters
This figure plots firm-year observations clustered according to their use of each debt type. For each cluster, the figure shows each debt type normalized by total debt. Definitions of the variables are provided in section 3.3

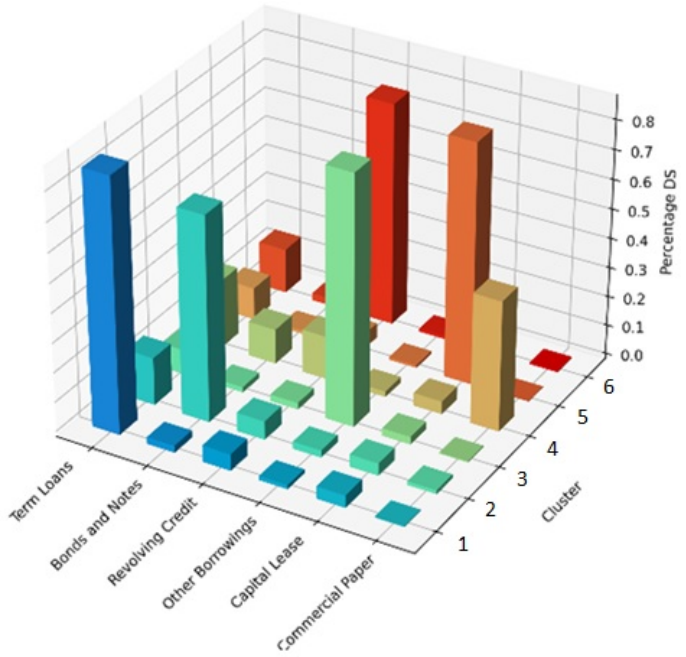

Table 4: Cluster Analysis
The cluster analysis started with an optimal cluster model, K-means, that utilizes machine learning to detect the appropriate amount of clusters based on our dataset, which totalled six clusters. We then employed six clusters in the next step to uncover the aggregated means of the debt types and firm characteristics below. Definitions of the firm characteristics can be found in section 3.3. Size is reported in millions.

	Debt types						Firm Characteristics						
Cluster	TL/TD	BN/TD	RC/TD	OB/TD	CL/TD	CP/TD	Size	M/B	Prof	ML	CF vol	HHI	Obs
1	0.8619	0.0238	0.0561	0.0138	0.0416	0.0028	888	4.6670	-0.0311	0.5201	0.2668	0.7627	9260
2	0.1612	0.6966	0.0629	0.0244	0.0420	0.0128	6662	1.8407	-0.0042	0.3882	0.1580	0.5384	2983
3	0.0834	0.0181	0.0222	0.8469	0.0259	0.0035	1313	2.0893	-0.0456	0.4357	0.3328	0.7572	5344
4	0.2312	0.1180	0.1471	0.0187	0.0436	0.4414	3226	1.3993	0.0812	0.3134	0.1666	0.2786	2557
5	0.1099	0.0110	0.0500	0.0088	0.8194	0.0010	790	4.2506	-0.0496	0.4637	0.2479	0.7295	5767
6	0.1526	0.0241	0.7595	0.0101	0.0499	0.0039	855	3.8903	0.0115	0.4257	0.2342	0.6307	940

Our analysis reveals that there are five clusters of firms that exhibit a high degree of specialization in a particular type of debt, while only one cluster displays a more diversified approach to debt utilization. Table 4 provides the average values

for various debt types and key firm characteristics within these identified clusters.

Cluster 1 contains the third smallest-sized firms. With relatively low profitability, the highest market leverage, high CF volatility and the highest M/B. These firms primarily rely on term loans for financing, with an average term loan to total debt ratio of 0.86.

Cluster 2 exhibit the largest firms with an average profitability, relatively low market leverage, lowest CF volatility, and low M/B. Cluster 2 predominantly relies on bonds & notes, with a cluster mean bonds & notes to total debt ratio of 0.70, and a portion of term loans with a cluster mean term loans to total debt ratio of 0.16.

Firms in Cluster 3 have the third largest firm size, low profitability, average market leverage, the highest CF volatility, and medium M/B. Cluster 3 primarily depends on other borrowings, with an average other borrowings to total debt ratio of 0.86.

Cluster 4 employs a combination of commercial papers, term loans, revolving credit, and bonds & notes. The respective mean ratios for these debt types within the cluster are 0.44, 0.23, 0.15, and 0.12. Notably, this cluster consists of firms with the second largest size, lowest market leverage, low CF volatility, lowest M/B, and the highest profitability.

Cluster 5 comprises the smallest companies in the sample, exhibiting the lowest profitability, higher market leverage, high M/B, and the average CF volatility. These firms predominantly rely on capital leases for financing, with an average capital lease to total debt ratio of 0.82.

Cluster 6 consists of firms with a smaller size and the second highest profitability. They possess average market leverage, average CF volatility, and relatively high M/B. Firms in Cluster 6 primarily utilize revolving credit, with an average revolving credit to total debt ratio of 0.76.

To summarize, the results of the cluster analysis suggest that 80% of the Nordic companies predominantly borrow from a sole source of financing, which confirms the findings of Colla et al. (2013) which reported that 80% of United States companies also rely on a single type of debt. This evidence further supports the notion that debt specialization is a widespread phenomenon among listed Nordic companies. While Colla et al. (2013) found that the largest companies in the

U.S. are diversified, we find that the largest companies in the Nordic specialize in bonds & notes. For the Nordic we find that companies with relatively large size, low market leverage, low CF volatility, lowest M/B, and the highest profitability are the most diversified. Colla et al. (2013) who found that the most diversified companies have the lowest M/B ratio, highest profitability, and highest market leverage. M/B ratio and profitability seem to be consistent between the markets while market leverage differs.

The American market has a larger and more liquid bond market, allowing companies to access diverse funding sources and potentially have higher market leverage. In contrast, the Nordic region's bank-centric system and stricter lending criteria may result in lower market leverage for companies with less debt specialization.

5.1.2 Reliance on One Debt Type

To examine debt specialization, an alternative approach is to calculate the proportion of firm-year observations in the data set that rely significantly on a particular type of debt. Various thresholds, ranging from 10% to 99%, are employed to identify significant usage levels. For each debt type and threshold, the percentage of firms using that debt type at or above the specific threshold is computed. The maximum value for each debt type is 1. The "Total" row represents the sum of significant users across all debt types. If a firm allocates at least 10% of its debt to each debt type, the total value for the 10% threshold would be six. Conversely, if a firm concentrates its debt on a single debt type, the corresponding debt type value would be 1, while all other debt type values would be 0 across all thresholds.

Table 5: Threshold Analysis
This table displays the percentage of firm-year observations that utilize a specific debt type above a certain threshold. Each column represents a different threshold, indicating the percentage of observations that utilize more than that threshold percentage of debt from a single debt type. The "Total" column represents the cumulative percentage across all thresholds, indicating the share of firm-year observations that employ more than the specified threshold level of debt from at least one debt type.

	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	99%
TL/TD	72.9509	67.7647	62.4237	57.5041	52.5587	47.3983	41.8079	36.0540	29.2853	25.3376	20.6846
BN/TD	20.7964	17.2529	14.0621	11.5765	9.4951	7.4826	5.8915	4.3949	2.8898	2.1502	1.6341
RC/TD	35.5724	29.1563	24.1335	20.0052	16.4101	13.6407	11.1465	8.7899	6.5365	5.3926	4.3777
CL/TD	21.9833	14.4663	11.0433	8.8415	7.4052	6.2871	5.4184	4.7906	4.4121	4.2057	4.0853
CP/TD	4.7992	3.0876	2.2878	1.4707	0.8601	0.5332	0.1978	0.0602	0.0516	0.0172	0.0000
OB/TD	8.9619	6.6053	5.2636	4.4551	3.9821	3.5435	3.3199	2.8812	2.4426	2.2620	2.0728
Total	1.6502	1.3803	1.1919	1.0384	0.9072	0.7889	0.6780	0.5630	0.4565	0.3941	0.3284

Table 5 reveals that approximately one-third of the firm-year observations in the entire dataset exclusively rely on a single debt type. Furthermore, 46% of the observations acquire over 90% of their debt from a single debt type, while 79% obtain more than 60% of their debt from a single debt type. In comparison, the findings of Colla et al. (2013) in the American market differ from those in the Nordic market. Their study indicates a 17% debt specialization for rated companies and a 36% debt specialization for unrated companies. This suggests that the Nordic market exhibit a debt specialization pattern that more closely resembles that of the American unrated firms. Moreover, Table 5 demonstrates that term loans are the most prevalent debt type in the Nordic market, significantly differing from the American market, which displays a greater emphasis on specialization in bonds & notes.

5.1.3 Conditional Debt Structure

In this section, we conduct a conditional debt structure analysis. We impose the condition of 30% and 50% conditional debt, following Colla et al. (2013). We then compare the resulting mean values to examine which other debt types are the most utilized conditionally.

Table 6: Conditional Debt Structure
This table presents findings on the conditional debt structure. To analyze this, we set a condition that the utilization of a specific debt type must exceed 30% of total debt, and then 50% of total debt. We calculate the average ratios of each debt type to total debt for the subset of observations that meet this condition. Definitions of the variables can be found in section 3.3.

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD
TL >30%	0.7905	0.0439	0.0880	0.0506	0.0098	0.0172
BN >30%	0.1880	0.6515	0.0738	0.0423	0.0200	0.0244
RC >30%	0.2059	0.0390	0.6747	0.0574	0.0112	0.0117
CL >30%	0.1727	0.0246	0.0831	0.7031	0.0033	0.0131
CP >30%	0.2130	0.1013	0.1348	0.0419	0.4869	0.0221
OB >30%	0.1384	0.0286	0.0369	0.0307	0.0053	0.7600

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD
TL >50%	0.8636	0.0250	0.0578	0.0378	0.0037	0.0121
BN >50%	0.1146	0.7752	0.0438	0.0359	0.0109	0.0195
RC >50%	0.1179	0.0214	0.8065	0.0428	0.0028	0.0085
CL >50%	0.0839	0.0084	0.0408	0.8588	0.0011	0.0071
CP >50%	0.1695	0.0459	0.0804	0.0375	0.6468	0.0199
OB >50%	0.0663	0.0122	0.0167	0.0201	0.0036	0.8811

In Table 6, we execute the condition that the usage of a specific type of debt must be greater than 30% and 50%. For 30% the main diagonal indicates that conditional mean usage for a specific type of loan upon which we impose the condition is between 49% and 79%. For the 50% condition, the usage is between 65% and 88%. The borrowers for all the other debt categories include usage of term loans in their debt structure in a range of 13.72% to 21.30% given the 30% condition and 6% to 17% for the 50% condition. The users of commercial paper also utilize 10.13% bonds & notes and 13.48% revolving credit for the 30% condition. Evidently, term loans, and bonds & notes usage are the two most common conditioned debt types.

As a comparison, we look at the results Colla et al. (2013) got from the U.S.

Their results differ from the results for the Nordic market. For both rated and unrated American firms, senior bonds & notes are the most frequently used debt type, and companies that mainly borrow in the other debt types also have a significant number of senior bonds & notes. This pattern is kindred to that of the Nordic term loan.

5.1.4 Nordic Bank and American Bonds Financing

Several factors contribute to the prevalence of bonds & notes usage in the U.S. compared to the dominant bank-based term loans financing in the Nordic countries. We outline two possible explanations for this contrast.

The first explanation revolves the market structure. The United States has a larger and more developed bond market, providing a broader investor base and greater liquidity. This makes bonds and notes a viable financing option for companies. In contrast, the Nordic credit market is much smaller, leading to less common issuance of bonds and notes. This may be due to limited investor demand, higher transaction costs, or regulatory considerations that contributes to this dynamic, asserting the basis for a high-yield bond market in the Nordic. Such instances make ground for term loans to be a more efficient debt instrument for companies, combined with the fact that the Nordic countries have strong and stable banking systems, which we believe in turn lead to a preference for term loans in the Nordic region. The second explanation is size and demand, as the need for bonds and notes as a debt finance alternative is usually for large loans greater than the bank can issue, which naturally is related to the size of a company, as a larger firm requires larger amounts of money for investing or other purposes. Our dataset showed that only a small portion of the public companies in the Nordic had credit ratings, which Hale and Santos (2009) claims is unlikely for firms to pay for, unrelated to bond issuance. Based on the size comparison for our Nordic firms and the American firms in Colla et al. (2013), the size differential indicates a larger need for bonds & notes in the U.S. Denis and Mihov (2003) said that smaller firms on average, are more risky than larger firms, therefore a larger firm could get better coupon rates than a smaller one. Consequently, the low percentage of Nordic firms with a credit rating might enhance the explanation of size as the most important factor for the favoured debt choice between BN and TL.

5.1.5 T-test & Wilcoxon test

Table 7: T-test and Wilcoxon test
To determine if our firm characteristics are significantly different between the least and most debt specialized firms, one-way sorting by HHI is carried out year by year and then aggregated across years. Columns (1)–(4) present the mean and median values of firm characteristics in the first and third tertiles of HHI. The last two columns present test statistics and significance level for the t-test and Wilcoxon test of the differences in debt specialization between the first and third tertile. Definitions of the variables are provided in section 3.3. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	1^{st}Tertile		3^{rd}Tertile		Tests of differences	
	Mean	Median	Mean	Median	t-test	Wilcoxon test
	(1)	(2)	(3)	(4)		
ln Size	19.8527	19.8973	17.7839	17.7887	38.27***	-32.98***
ln Sales	19.6687	19.8433	16.4754	17.4634	35.29***	-34.94***
M/B	1.7758	0.7273	3.8382	1.2453	-2.51***	-22.47***
Profitability	0.0235	0.0537	-0.0825	0.0254	10.30***	-14.61***
Dividend Payer	0.5861	1.0000	0.3378	0.0000	20.77***	-42.33***
Tangibility	0.2477	0.1803	0.1821	0.0665	10.05***	-15.73***
CF Volatility	0.0855	0.0264	0.3905	0.0499	-3.16***	-18.14***
Book Leverage	0.2732	0.2405	0.2056	0.1069	2.63***	-20.44***
Advertising	0.3031	0.2143	0.3973	0.2804	-9.86***	-10.42***

For the most specialized firms (3rd tertile), we observe a lower value in size, sales, dividend payer, tangibility and book leverage. At the same time the most specialized firms have a higher M/B, cash flow volatility and advertising. These variables are all significantly different, indicating that these firm characteristics can bring forth a better understanding of debt specialization.

5.1.6 Multivariate Evidence on Debt Specialization

Table 8 and table 9 presents the results of the multivariate regression for the dependent variables HHI and DS90. The firm-specific variables are employed as independent variables. Although our selection of variables differs slightly to Colla et al. (2013), it allows for a comparison to their research conducted in the United States.

We conduct four separate regressions for debt specialization, incorporating time-fixed effects and industry-fixed effects. Subsequently, we introduce country-fixed effects and perform an additional four separate regressions. The initial column includes standard firm-specific characteristics commonly employed in debt research, namely size, profitability, M/B, dividend payer and tangibility. In the subsequent three columns, we individually introduce cash flow volatility, advertising, and book leverage to examine their impact on debt specialization.

Table 8: Multivariate Analysis HHI

This table presents regression results to examine the relation between firm characteristics and debt specialization. The dependent variables is HHI, which measures debt specialization as explained in section 3.2. In columns (1) we include common determinants of capital structure choices. In column (2) we add cash flow volatility. In column (3) we add advertising. In column (4) we further add book leverage. Definitions of the variables are provided in section 3.3. Serial correlation and heteroscedasticity are present. All right-hand side variables are lagged. All regression outputs include industry fixed effects and year fixed effects. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	HHI 1	HHI 2	HHI 3	HHI 4	HHI 5	HHI 6	HHI 7	HHI 8
Ln Size	-0.0407 ***	-0.0409 ***	-0.0424 ***	-0.0413 ***	-0.0405 ***	-0.0453 ***	-0.0472 ***	-0.0463 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
M/B	0.0240 ***	0.0241 ***	0.0244 ***	0.0224 ***	0.0213 ***	0.0215 ***	0.0217 ***	0.0199 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Profitability	0.0212	0.0184	0.0173	0.0051	0.0273 **	0.0239 *	0.0223	0.0101
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Dividend Payer	-0.0035	-0.0033	-0.0002	-0.0023	0.155 **	0.0157 **	0.0194 ***	0.0173 **
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.072)	(0.007)
Tangibility	-0.0184	-0.0033	-0.0214	0.0017	-0.0385 ***	-0.0386 ***	-0.0428 ***	-0.0213
	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)
CF Volatility		-0.0667	-0.0130	-0.0146		-0.0169	-0.0160	-0.0175
		(0.017)	(0.015)	(0.015)		(0.016)	(0.016)	(0.016)
Advertising			-0.0333 ***	-0.0388 ***			-0.0395 ***	-0.0452 ***
			(0.010)	(0.010)			(0.010)	(0.010)
Book Leverage				-0.1214 ***				-0.1161 ***
				(0.017)				(0.017)
Fixed Effects Year & Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects Country	No	No	No	No	Yes	Yes	Yes	Yes
Observations	8801	8801	8801	8801	8801	8801	8801	8801
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Adj R2	0.201	0.201	0.202	0.206	0.223	0.223	0.225	0.229

Table 9: Multivariate Analysis DS90

This table presents regression results to examine the relation between firm characteristics and debt specialization. The dependent variables is DS90, which measures debt specialization as explained in section 3.2. In columns (1) we include common determinants of capital structure choices. In column (2) we add cash flow volatility. In column (3) we add advertising. In column (4) we further add book leverage. Definitions of the variables are provided in section 3.3. Serial correlation and heteroscedasticity are present. All right-hand side variables are lagged. All regression outputs include industry fixed effects and year fixed effects. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	DS90 1	DS90 2	DS90 3	DS90 4	DS90 5	DS90 6	DS90 7	DS90 8
Ln Size	-0.0564 ***	-0.0569 ***	-0.0593 ***	-0.0569 ***	-0.0612 ***	-0.0613 ***	-0.0649 ***	-0.0629 ***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
M/B	0.0403 ***	0.0403 ***	0.0408 ***	0.0365 ***	0.0371 ***	0.0372 ***	0.0377 ***	0.0336 ***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Profitability	-0.0262	-0.0260	-0.0281	-0.0550 **	-0.0227	-0.0239	-0.0269	-0.0544 **
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Dividend Payer	0.0161	0.0161	0.0221 *	0.0175	0.329 **	0.0330 **	0.401 ***	0.0354 ***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Tangibility	-0.0309	-0.0309	-0.0367	0.0139	-0.0636 **	-0.0636 **	-0.0717 ***	-0.0231
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
CF Volatility		0.0011	0.0028	-0.0007		-0.0057	-0.0039	-0.0073
		(0.032)	(0.032)	(0.032)		(0.030)	(0.029)	(0.029)
Advertising			-0.0652 ***	-0.0772 ***			-0.0756 ***	-0.0887 ***
			(0.019)	(0.019)			(0.019)	(0.019)
Book Leverage				-0.661 ***				-0.2623 ***
				(0.032)				(0.032)
Fixed Effects Year & Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects Country	No	No	No	No	Yes	Yes	Yes	Yes
Observations	8801	8801	8801	8801	8801	8801	8801	8801
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Adj R2	0.145	0.145	0.146	0.153	0.174	0.176	0.158	0.169

Our findings indicate a negative yet highly significant relationship between firm size and debt specialization. This outcome aligns with the conclusions of Giannetti (2019), who argue that there is a negative relationship between firm size and debt concentration. Even though their results were not significant for all regressions, Colla et al. (2013) argue that the cost of monitoring should result in less transparent firms specializing in their debt structure. Larger firms, subject to more comprehensive monitoring, incur lower information costs and are thus able to obtain a more diversified debt structure.

The tangibility variable is significant and negative when country fixed effects are included and book leverage is not included. These findings suggest that the relationship between tangibility and debt specialization is context-dependent and influenced by other factors, such as financial leverage. A reason could be that firms with tangible assets have lower expected bankruptcy costs and thereby are able to diversify their debt portfolio.

Additionally, we identify a significant and positive correlation between M/B and debt specialization. This result suggests that firms with higher M/B tend to adopt more concentrated debt structures. This finding is in line with the conclusions drawn by Rauh and Sufi (2010) and Colla et al. (2013).

Furthermore, we observe that book leverage has a significant negative impact on debt specialization which aligns with the results from Colla et al. (2013). Advertising has a significant negative correlation with debt specialization.

Furthermore, we observe a modestly significant and positive correlation between profitability and HHI on a 5% and 10% level when country fixed effects are included, but no significant correlation between DS90 and profitability. This finding deviates from the outcomes of Colla et al. (2013), who initially discover a significant negative relationship but subsequently find no significance upon introducing additional regression variables. The positive relationship between profitability and specialization may be attributed to the fact that highly profitable firms possess greater flexibility in selecting their optimal debt structure, allowing them to concentrate on preferred sources.

5.1.7 Economic Analysis

The regression results for the U.S. and Nordic regions, focusing on the relationship between debt specialization measured by DS90 and HHI and the independent variables show some inconsistencies in the significance for size, cash flow volatility and tangibility. These variables might provide insights into the differences between bond-based financing in the U.S. and bank-based financing in the Nordic countries.

Economic Interpretation of Size

The market structure in the American market is characterized by a larger and more liquid bond market as mentioned in section 5.1.4, where a wide range of investors participate. In this context, bondholders may have less concern about company size since they can easily diversify their holdings across various issuers. On the other hand, the Nordic market, with its bank-centric system, may have a smaller pool of lenders, making the size of companies more relevant in determining the creditor composition. Another factor might be that bondholders in the U.S. market typically have well-defined rights and legal protections through bond indentures and regulatory frameworks. As a result, they may focus more on factors such as credit ratings and bond-specific features rather than company size when assessing investment opportunities. In the Nordic bank-based financing system, where lending relationships play a prominent role, creditors may be more concerned about the size of companies as it can influence the extent of their exposure and bargaining power in debt negotiations. Lastly, information asymmetry can be a factor. Bondholders in the U.S. market often rely on publicly available information and financial disclosures to make investment decisions. Size may be less relevant in this context, as investors have access to comprehensive financial data and credit risk assessments. In the Nordic bank-based system, where lending relationships are more intimate, creditors may have a deeper understanding of companies' operations and may consider size as a proxy for stability and ability to service debt.

Economic Interpretation of Cash Flow Volatility

In the bond-based financing system in the U.S., bondholders are typically more dispersed and have limited direct control over company operations. Therefore, they may be more concerned about the stability and predictability of a company's cash flow to ensure timely debt repayments. On the other hand, bank lenders in the Nordic countries often maintain closer relationships with borrowers, enabling them to have more comprehensive information about the financial health and future prospects of companies. This allows them to evaluate creditworthiness beyond the short-term volatility of cash flows. An other factor might be that bond financing in the American market often involves publicly traded bonds with

standardized terms and legal protections. Bondholders may rely on quantitative measures such as cash flow volatility as an additional risk assessment tool, given the limited control they have over company operations. In the Nordic bank-based financing system, loan structures and collateralization practices may be more flexible and take into account a broader range of factors beyond short-term cash flow fluctuations. Thirdly, bank-based financing in the Nordic countries is characterized by long-standing relationships between lenders and borrowers. Banks have the advantage of detailed knowledge about the financial performance and stability of companies over time. Therefore, they may place less emphasis on short-term cash flow volatility when assessing creditworthiness, instead considering the overall financial strength and long-term prospects of the borrower.

Economic Interpretation of Tangibility

In the American bond market, where bondholders are typically diverse and have limited direct control over company operations, the focus on tangibility may stem from a desire to have collateralized assets in the event of default. Tangible assets, such as property, plant, and equipment, provide a form of security to bondholders. On the other hand, bank lenders in the Nordic countries may have a more comprehensive understanding of borrower risk profiles, including qualitative factors, and may rely on a broader set of criteria beyond tangibility. Another factor might be that bank-based financing systems in the Nordic countries often emphasize long-standing relationships between lenders and borrowers. In such systems, banks have more direct knowledge about the financial health, operations, and future prospects of companies. This closer relationship may reduce the reliance on collateral-based measures like tangibility and instead focus on a holistic assessment of a company's creditworthiness. Lastly, bond financing in the U.S. market typically involves publicly traded bonds with standardized terms and legal protections. As a result, bondholders may prioritize tangible assets as collateral to secure their investment. In the Nordic bank-based system, loan structures and collateralization practices may vary more widely, allowing for more flexible arrangements that consider other forms of security beyond tangible assets.

5.2 Country Specific Analysis

In this section, our focus is on assessing the level of debt specialization among the Nordic countries and examining their debt distribution patterns. By examining the summary statistics and t-test presented in appendix table 15 and 16, we observe that different countries possess some distinct firm characteristics. Our objective is to explore potential relationships between the countries, firm characteristics, and their preferences for specific debt structures.

Table 10: Country Statistics
This table reports the share of each debt type in percentage that each country utilizes. The column HHI shows the debt specialization measured by HHI for each country.

	RC/TD	TL/TD	BN/TD	CP/TD	CL/TD	OB/TD	HHI
Sweden	25.7182	48.9902	8.8299	1.0548	10.3410	5.0660	70.7726
Finland	9.5909	60.6903	9.5898	6.1738	9.7381	4.2171	62.9805
Denmark	11.6530	60.0608	11.7259	0.0043	11.3166	5.2393	75.4554
Norway	16.1582	49.3861	16.5008	0.1423	12.0290	5.7837	68.2668

Based on the data presented in Table 10, there is a notable range of debt specialization observed through HHI. Denmark is the most specialized, followed by Sweden, Norway and Finland respectively. Examining the distribution of different debt types, Sweden stands out with the 26% of its debt allocated to revolving credit. When it comes to term loans, both Denmark and Finland have approximately 60-61% of their debt in this category. Norway demonstrates the highest concentration in bonds & notes, with this instrument accounting for 17% of its total debt. Finland, on the other hand, allocates 6% of its debt to commercial paper. Although the disparities between nations are not substantial, it is notable that Norway exhibits the highest proportion of capital leases and other borrowings among the Nordic countries.

5.2.1 Threshold Analysis for Countries

To conduct a more comprehensive analysis of the dataset a threshold analysis for the countries was performed. The analyses were done on the threshold levels 30%, 60%, 90%, and 99% to find similarities and differences in debt specialization among the countries.

Table 11: Threshold Analysis for Countries
This table reports the share of firm-year observations that use one debt type above 30%, 60%, 90%, and 99% threshold for each country. "Total" is the sum of all share values for each country and represents the share of firm-year observations that employ more than the respective threshold of debt from one debt type.

30%	TL	BN	RC	CL	CP	OB	Total
Norway	59.41	20.40	20.70	11.96	0.04	5.87	118.39
Sweden	57.94	11.33	32.32	10.84	1.18	5.27	118.89
Denmark	69.66	14.82	14.47	11.59	0.00	5.97	116.51
Finland	73.27	13.91	11.78	9.98	9.27	4.45	122.66

60%	TL	BN	RC	CL	CP	OB	Total
Norway	45.09	12.56	10.42	7.12	0.00	4.63	79.81
Sweden	43.31	6.29	19.80	6.58	0.12	3.71	79.80
Denmark	57.65	8.57	8.43	6.88	0.00	3.51	85.04
Finland	54.35	4.30	3.64	4.02	2.60	2.27	71.19

90%	TL	BN	RC	CL	CP	OB	Total
Norway	24.39	4.89	4.67	4.93	0.00	2.91	41.79
Sweden	27.48	2.64	9.67	4.69	0.00	2.85	47.33
Denmark	37.64	4.14	4.63	5.13	0.00	2.46	54.00
Finland	34.39	0.43	1.14	2.51	0.28	0.95	39.69

99%	TL	BN	RC	CL	CP	OB	Total
Norway	16.20	2.53	3.21	4.63	0.00	2.31	28.89
Sweden	20.69	1.55	6.42	4.33	0.00	2.52	35.51
Denmark	27.46	2.67	3.58	4.63	0.00	2.11	40.45
Finland	21.38	0.14	0.47	2.37	0.00	0.66	25.02

When examining table 11, Norway, Sweden, and Denmark display a relatively similar pattern for the 30% and 60% thresholds. For approximately 81% of cases, the debt of these three countries comprises over 60% of a single debt type. Finland has a slightly lower percentage on the same threshold, at 71%. However, we observe significant variations between the countries for the 90% and 99% thresholds. Specifically, Denmark exhibits the highest level of specialization independent of category with a rate of 41%, followed by Sweden with 37%, Norway with 30%, and Finland with the lowest level of specialization with a rate of 26%.

Our analysis again shows that term loans are the most specialized debt category across all Nordic countries. At the 30% and 60% thresholds, Finland exhibits the highest level of specialization in term loans. However, as thresholds increase, Denmark gradually becomes the most specialized while Norway gradually becomes the least. Evidently, Norway shows the highest degree of specialization for the bonds & notes category for all the thresholds. Sweden specializes the most in revolving credit, commercial paper is most specialized in Finland and capital lease is generally low, but most specialized in Norway and Denmark. The

other borrowings category is evenly most specialized across Norway, Denmark, and Sweden.

5.2.2 Country-Specific Conditional Debt Structure

A distinct pattern can be observed amongst the countries in terms of their debt specialization, which is further supported by the results of the country specific conditional table 27, 28, 29, and 30 in the appendix. Specifically, Norway, Sweden, and Denmark exhibit comparable degrees of specialization across various debt types. On the other hand, Finland displays significantly lower levels of specialization across all debt types exempt for term loans and commercial paper.

These findings provide further validation of the significant utilization of term loans in all Nordic countries. Additionally, borrowers across all other debt categories also employ a substantial amount of term loans in their debt portfolio. Notably, borrowers in Denmark and Finland tend to employ a higher proportion of term loans alongside bonds & notes compared to Sweden and Norway. Finland uses the highest amount of term loans in combination with revolving credit. Furthermore, Finland exhibits a considerably higher level of term loans than the other countries when combined with capital leases. In terms of commercial paper observations, only Finland and Sweden have more than one observation, and of the two, Finland has a greater reliance on commercial paper. Lastly, when combined with other borrowings, Finland utilizes the largest amount of term loans in combination with other borrowings. The borrowers of bonds & notes, and commercial paper in Finland also use 9.25% and 13.17% revolving credit, respectively. Similarly, in Sweden, 10.16% use revolving credit given $CL > 30\%$. Moreover, we observe usage of 18.57% bonds & notes, and 14.54% revolving credit for $CP > 30\%$.

5.2.3 Multivariate Country-Specific Analysis

Table 12: Country Specific Multivariate Analysis
This table presents regression results to examine the relation between firm characteristics and debt specialization for each country individually. The dependent variable is HHI, which measures debt specialization. In the columns, we include common determinants of capital structure choices. Definitions of the variables are provided in section 3.3. Serial correlation and heteroscedasticity are present. All right-hand side variables are lagged. All regression outputs include industry fixed effects and year fixed effects. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

HHI	Norway	Sweden	Denmark	Finland
Ln Size	-0.0432***	-0.0403***	-0.0318***	-0.0796***
	(0.004)	(0.003)	(0.005)	(0.004)
M/B	0.0199***	0.0165***	0.0207***	0.0376***
	(0.005)	(0.002)	(0.004)	(0.007)
Profitability	0.0757***	-0.0522***	-0.0275	-0.0289
	(0.029)	(0.018)	(0.029)	(0.034)
CF Volatility	0.0170	-0.0062	-0.0890	-0.0308***
	(0.043)	(0.012)	(0.056)	(0.016)
Tangibility	0.0524**	-0.0700***	0.0276	-0.0308
	(0.026)	(0.021)	(0.020)	(0.027)
Book leverage	0.0092	-0.1563***	-0.1112***	-0.1643***
	(0.006)	(0.027)	(0.038)	(0.036)
Dividend Payer	-0.0754***	0.0510***	0.0478**	-0.0308*
	(0.014)	(0.012)	(0.109)	(0.016)
Advertising	-0.0307	-0.0510***	0.0043	-0.0630***
	(0.020)	(0.014)	(0.031)	(0.024)
No obs	1658	4198	1172	1775
Adj R2	0.251	0.189	0.191	0.362
Year and Industry fixed effects	YES	YES	YES	YES

The country-specific multivariate analysis examines the effects and significance of various firm characteristics on debt specialization. Notably, the variables tangibility, profitability, and advertising show varying levels of significance across the countries. Tangibility and profitability are highly significant in Norway and Sweden but lack significance in Denmark and Finland. Specifically, tangibility has a positive impact on debt specialization in Norway and a negative impact in Sweden. Advertising also demonstrates varying degrees of significance, being significant in Sweden and Finland but not in Norway and Denmark.

Cash flow volatility is particularly noteworthy, as it is highly negative and significant in Finland but not in the other countries. On the other hand, book leverage is significant for all countries except Norway.

The variable dividend payer is significant for all countries but at different levels. It has a negative significance for Norway at a 1% level, for Finland at a 10% level, and a positive significance for Sweden at a 1% level, and for Denmark at a 5% level. The variables ln size and M/B exhibit the same level of significance across the countries.

These findings highlight the varying significance and directionality of the variables in relation to debt specialization. They indicate that these variables contribute differently to the level of debt specialization in each country, suggesting the presence of distinct country-specific factors at play.

5.2.4 Country Findings

From the analysis, we find that Denmark is the most debt-specialized country, while Finland is the least. Among the countries, Norway exhibits the highest specialization in bonds and notes. When examining firm characteristics in table 15 in the appendix, we observe that companies in Norway possess certain attributes that may contribute to this higher utilization. Specifically, Norwegian companies tend to have larger sizes, lower cash flow volatility and advertising expenses, and higher levels of tangibility and book leverage. The larger size of Norwegian firms suggests that they have a greater capacity to access the capital markets for debt issuance. With their robust presence and financial stability, these companies are well-positioned to raise funds through the issuance of bonds and notes. This allows them to tap into the debt market and secure substantial financing to

support their operations and expansion initiatives. Furthermore, the higher level of tangibility observed in Norwegian companies indicates a greater need for significant assets and investments. Bonds and notes can serve as effective means of acquiring the necessary capital for these tangible assets, which may include infrastructure, equipment, or other long-term investments. By issuing bonds and notes, these firms can leverage their tangible assets to secure the required funding. Additionally, the higher book leverage exhibited by Norwegian companies suggests a greater reliance on debt financing in their capital structure. This reliance on debt makes bonds and notes an attractive option for meeting their funding requirements. The availability of bonds and notes allows these firms to optimize their capital structure by incorporating debt instruments that align with their financial goals and obligations. Norway has a significant presence in capital-intensive industries such as oil and gas, shipping, and renewable energy. These sectors often require substantial long-term investments in infrastructure, equipment, and exploration activities.

Since Norway is the most specialized within bonds & notes we want to look at the firm characteristics in comparison to the American firm characterises, since the United States is bonds & notes dominated. From the multivariate analysis done by Colla et al. (2013), the significant variables were positive M/B, negative tangibility, negative dividend payer in a 10% level, positive CF vol, negative book leverage. From our multivariate analysis for Norway we find that the significant variables are negative size, positive M/B, positive profitability, positive tangibility, negative dividend payer.

Comparing the significant variables between the two markets, some similarities and most differences emerge. Both markets show a positive relationship between debt specialization and the market-to-book ratio (M/B), indicating that firms with higher valuation multiples are more likely to have specialized debt in bonds and notes. However, all the other significant factors differs between the two countries indicating that we cannot conclude distinct firm characteristics that are present in these two markets and not in the other Nordic countries.

Despite Norway having the highest specialization in bond & notes, it is worth noting that it still exhibits significant specialization in other debt types as well. This indicates that while bond & notes specialization is present, term loans might

play a predominant role in the country's financial landscape.

When looking into the different debt types we find that revolving credit is most specialized in Sweden. From firm characteristics in table 15 in the appendix, we find that Sweden has a smaller firm size, low profitability, dividend payer, tangibility, and book leverage. At the same time high M/B and advertising. Companies with these firm characteristics may have limited access to capital markets. Revolving credit offers flexibility and short-term funding for companies with limited financial resources and lower profitability. Additionally, the lower tangibility of assets and book leverage make it less attractive for companies to for instance issue bonds and notes or engage in capital leases.

For term loans, we find that Denmark and Finland are the most specialized. From firm characteristics, we find that Denmark has a bigger size, lower M/B, medium dividend payer, higher cash flow volatility, high tangibility, and relatively low book leverage and advertising.

For commercial paper, we find that only Finland specializes. From firm characteristics, we find that Finland has a bigger size, high M/B, high dividend payer, relatively high book leverage.

5.3 Industry-Specific Analysis

In this section, our focus is on assessing the level of debt specialization among various industries and examining their debt distribution patterns. By examining the summary statistics presented in appendix table 17, we observe that different sectors possess distinct firm characteristics. Our objective is to explore potential relationships between the industry, firm characteristics, and their preferences for specific debt structures.

Table 13: Debt Distribution and Specialization
This table reports the average share of debt types used for each industry. The column HHI reports the percentage of debt specialization. Industries MCE, ES, and OS are not included due to few unique observations.

	RC/TD	TL/TD	BN/TD	CP/TD	CL/TD	OB/TD	HHI
HCSA	26.4485	49.6185	1.7917	1.0407	16.3386	4.7619	61.3946
MAN	19.8920	54.3968	10.5664	2.2308	7.9427	4.9714	68.5744
INF	17.4484	50.1799	13.2833	1.9921	12.1537	4.9427	74.5732
PSTS	21.5134	46.8277	6.3602	0.9081	19.5490	4.8415	76.5139
RT	26.8605	41.1329	7.1685	1.7603	15.2423	7.8355	62.4753
ASWS	32.1841	37.7276	13.9898	1.9136	6.6065	7.5785	66.6658
WT	16.5555	63.7701	2.4575	0.3948	9.8046	7.0174	67.0646
AFFH	20.5501	62.8576	6.4072	0.0000	9.1826	1.0025	59.1108
MIN	12.9856	53.6090	22.3266	0.1431	6.7709	4.1648	73.3626
AFS	18.7518	64.8794	4.6775	0.3811	9.2359	2.0744	77.1801
TW	7.3060	57.8549	16.8391	0.2198	14.4081	3.3722	65.8639
CON	14.9487	55.5461	10.2564	2.4500	10.0326	6.7663	59.7772
AER	10.6162	52.2874	13.8057	0.0000	17.7215	5.5691	73.8480

Based on the data presented in Table 13, there is a notable range of debt specialization observed, ranging from 59% to 77%. Sectors Accommodation and Food Services (AFS), PSTS, INF, MIN, and AER stand out with an HHI level above 70%, indicating a high concentration of debt type within these sectors. Conversely, sectors Construction (CON), AFFH, Health Care and Social Assistance (HCSA), and Retail Trade (RT) exhibit an HHI below 65%, suggesting a lower concentration of debt.

Examining the distribution of different debt types, sector Administrative and Support and Waste Services (ASWS) stands out with the 32% of its debt allocated to revolving credit. When it comes to term loans, sectors AFS, Wholesale Trade (WT), and AFFH allocate over 60% of their debt to this category. MIN demonstrates the highest concentration in bonds and notes, accounting for 22% of its total debt. In terms of capital lease, sector PSTS allocates 20% of its debt to this category.

5.3.1 Threshold Analysis for Industry

Table 14: Threshold Analysis for Industries
This table reports the share of firm-year observations that use one debt type above 99% threshold for each industry. "Total" is the sum of all share values for each industry and represents the share of firm-year observations that employ more than 99% of debt from one debt type.

	TL/TD	BN/TD	RC/TD	CP/TD	CL/TD	OB/TD	Total
HCSA	6.56	0.82	0.82	0.00	0.82	1.64	10.66
MAN	21.10	1.31	4.40	0.00	2.81	2.19	42.81
INF	26.50	1.54	5.32	0.00	7.38	2.32	37.06
PSTS	23.82	2.72	5.74	0.00	11.76	2.65	46.74
RT	9.11	1.69	8.05	0.00	2.12	2.97	23.95
ASWS	12.50	0.54	12.23	0.00	2.72	2.45	30.44
AFFH	24.22	0.00	0.62	0.00	0.62	0.00	25.46
MIN	25.25	5.15	2.66	0.00	1.66	1.83	37.08
AFS	30.88	2.21	0.74	0.00	0.00	0.00	33.83
TW	19.31	1.08	2.89	0.00	2.53	1.08	26.89
CON	17.80	0.20	1.00	0.00	1.80	1.00	21.72
AER	18.83	6.49	0.65	0.00	9.74	0.65	36.26

Our threshold analysis on the sectors discovered that sector AER exhibited the highest degree of specialization on the 60% and 90% thresholds. However, its level of specialization became average at the 99% threshold. Conversely, sectors PSTS and MAN demonstrated a high degree of specialization at the 60% and 90% thresholds but emerged as the most specialized at the 99% threshold. In terms of the least specialized sectors, sector AFFH was found to be the least specialized at the 60% threshold, while both sectors AFFH and HCSA were identified as the least specialized at the 90% threshold. At the 99% threshold, sector HCSA displayed a further decline in specialization, being the least specialized. Our threshold sector analysis for various debt categories showed that all sectors have the highest proportion of their debt in term loans for all thresholds, consistent

with the result for countries in 5.2.1. Sector AFS exhibits the highest volume of term loans across all thresholds, except for the 30% threshold where sector AFFH takes precedence. When looking at the most specialized sectors within bonds & notes we find that on both a 90% and a 99% level sector AER is the most specialized closely followed by MIN. On a 60% threshold, we find that AER is the most specialized, but sectors MIN, ASWS, and INF have relatively elevated levels of specialization. When looking at the most specialized sectors within revolving credit we find that Sector ASWS is the most specialized followed by RT on a 99% level. For the 90% and 60% level sectors PSTS and HCSA also have high values. For capital leases we find that sectors PSTS and AER have the highest values across all thresholds. The sectors generally have a low degree of specialization in other borrowings. Commercial paper is not particularly used by any of the sectors.

5.3.2 Industry-Specific Conditional Debt Structure

For the Nordic as a whole, we imposed the same condition as outlined in 5.3.0 for each sector, the results can be found on the appendix table 23, 24, 25 and 26. Our research shows that term loans to total debt contain the most observations for all sectors, whilst bonds & notes to total debt and revolving credit to total debt mostly lie between the second most and third most. The least used debt type is commercial paper for all sectors, with capital leases and other borrowings alternating thereafter. We find that commercial paper to total debt is only employed by and utilized according to the condition for seven sectors and contributes the least of the debts overall, ranging between 47%-51% of those sector firms' debt. The most prevalent debt types utilized in combination with commercial paper are term loans and revolving credit with no specific sector standing out. Term loans to total debt are concentrated between 71%-87%, and the highest conditional utilization in sector AFS in combination with revolving credit. Bonds & notes to total debt range between 51%-80% and are evident in all sectors, although, in sectors WT, HCSA and AFS it occurs rarely. Sector AER contains the highest conditional concentration of bonds & notes, with term loans and capital lease as the secondary debt types. Revolving credit to total debt range between 54%-77% and is employed by all sectors, but most present in MAN and PSTS. Highest con-

ditional concentration is within sector TW with bonds & notes, and capital lease as secondaries. Capital lease ranges between 48%-82% of sector debt, with sector AER having the highest conditional concentration with revolving credit as the main secondary debt type. Other borrowings range between 34%-86% for different sectors, with sector INF having the highest conditional concentration combined with term loans as the main secondary debt type.

5.3.3 Industry Findings

Through the industry analysis, we find that the sectors AFS and PSTS have the highest specialization among the industries. The least specialized industries are Agriculture, Forestry, Fishing and Hunting (AFFH) and HCSA. To see if we find any distinct differences in their firm characteristics we compare the summary statistics. The only consistency we could find at this point is that AFS and PSTS have relatively high profitability while AFFH and HCSA have relatively low profitability. Neither the most nor the least specialized sectors have a big firm size.

AFS might exhibit high debt specialization due to the significant upfront investments required for infrastructure, equipment, and facilities, coupled with thin profit margins that make equity financing less viable.

AFFH might have low debt specialization due to the prevalence of self-financing, government subsidies, and alternative forms of financing such as agricultural programs. HCSA, often rely on government funding, donations, and grants, resulting in lower levels of debt specialization as compared to sectors heavily dependent on commercial debt financing.

Looking at term loans, we find that sectors AFS and AFFH have the highest percentage and specialization. They both have lower size, M/B, and dividend payer, and a higher tangibility, cash flow volatility, and book leverage. These sectors might require substantial upfront investments in infrastructure, equipment, and facilities, which are better suited for longer-term financing.

When looking at sectors with the highest concentration of bonds and notes/total debt, Arts, Entertainment & Recreation and MIN stand out. We find a more consistent pattern in the firm characteristics for these sectors. They both have low M/B, profitability, and dividend payer. And high tangibility. The economic rea-

son for having a high concentration of bonds and notes can be due to the substantial capital-intensive nature of these industries. The need for long-term financing and large-scale investments in infrastructure, equipment, and exploration activities makes bonds and notes an attractive option for securing funds and managing the financial requirements of these sectors.

Sectors AER and PSTS emerge as notable industries with a significant concentration of capital leases. Upon analyzing the firm characteristics, we observe that both sectors demonstrate traits such as small size, low M/B, dividend payment, and book leverage. Additionally, these sectors allocate substantial resources toward advertising activities. These sectors may rely on capital leases as a strategic financing option to acquire specialized equipment, technology, or infrastructure while maintaining operational flexibility.

Looking for the most concentrated sectors within revolving credit we find sectors ASWS, RT, and PSTS. The industries do not have similar firm characteristics, the common factors are low tangibility, and book leverage. These industries does not seem to experience substantial fluctuations in cash flows or seasonal demand variations. Nevertheless, they still benefit from revolving credit due to its flexibility in meeting short-term working capital needs. By leveraging this form of financing, businesses in these sectors can effectively manage their variable funding requirements and maintain operational agility.

6 Conclusion

This thesis provides new insight into the debt structure of public Nordic firms with a large sample of firm-year data. The data utilized in this thesis allowed us to differentiate debt into seven different types, procuring the perhaps most nuanced debt data available to date. We first present patterns showing signs of debt specialization. Then we identify how reliant the Nordic is on a singular debt type. Further, we exhibit the concentration levels of debt types and secondary debts. Subsequently, we provide test statistics for variables that can provide explanatory power to our findings before performing multivariate regressions with those variables. We compare our results with previous findings in the U.S. by Colla et al. (2013) where we uncover similarities and dissimilarities between the U.S. and the Nordic which we provide possible explanations for. We further distinguish our research from previous papers by delving into country-specific and sector-specific debt structure and specialization, which is conducted through similar procedures.

We conclude that there are significant disparities between the public American firms and the public Nordic firms in terms of debt types they favor, whereas the American market favors bonds & notes, the Nordic market favor term loans. We outline two potential explanations for this finding, firstly market structure differences and secondly size variations of included firms. However, both markets show the same pattern toward debt specialization, evidently, averaging 80% for both markets. Within the Nordic we discovered disparate proof of firm characteristics importance toward debt specialization, specifically, we found Ln Size, M/B, and Dividend Payer to be significant for all countries, whilst the remaining characteristics varied. Enclosed in the industry-specific research we recognized the same pattern as for the Nordic combined, and the country-specific research, that term loans in fact are the main source of debt for all sectors. However, we noticed big variations amongst secondary choice of debt, mainly that revolving credit and bonds & notes complimented the most frequently after term loans.

6.1 Limitations & Further Research

Throughout our thesis we found many variables with similarities and differences between countries and sectors, without being able to confirm the effects these had upon each other. For future research we suggest using our thesis as a basis to further perform multivariate regressions on country-divided sector characteristics to determine these effects, and include multiple variables besides ours, for instance a dummy for sector-leading firms and firm age. Another impediment to our analysis was our timeline confinement. Our data spanned from 2001 to 2021, thus, we prompted a lengthy Nordic dataset comparison with Colla et al. (2013)'s stringent timeline (2002-2009). Consequently, their results and ours sheds light on different periods. Although some years were common, there may be factors unaccounted for in the extra timeperiod, which have altered the results from what they should have been in a similar time-confinement. Therefore, we suggest to conduct supplementary research on the American debt specialization for more recent years, hence, more accurately comparing the markets and additionally be able to analyze how debt specialization and debt structure has evolved over time.

7 Appendix

Table 15: Country Statistics
The table shows number of observations in each country and the mean (median) values of each firm characteristic for the respective country. Definition of the variables can be found in section 3.3.

	Norway	Sweden	Denmark	Finland
Observations	2298	5804	1422	2112
ln Size	19.6126	18.2734	19.5616	19.4236
	(19.6124)	(18.1104)	(19.5034)	(19.2014)
ln Sales	18.6896	17.4684	19.1295	19.3420
	(19.1718)	(18.1091)	(19.4946)	(19.2095)
M/B	1.1531	1.8368	1.5795	1.1449
	(0.6554)	(1.0091)	(0.7592)	(0.8022)
Profitability	0.0109	-0.0488	0.0107	0.0606
	(0.0447)	(0.0423)	(0.0531)	(0.0626)
Dividend Payer	0.4063	0.4010	0.4713	0.7144
	(0.0000)	(0.0000)	(0.0000)	(1.0000)
CF Volatility	0.0672	0.1194	0.0841	0.0710
	(0.0299)	(0.0383)	(0.0316)	(0.0327)
Tangibility	0.3090	0.1515	0.3258	0.2252
	(0.2021)	(0.0741)	(0.2549)	(0.1709)
Book Leverage	0.3013	0.1953	0.2500	0.2461
	(0.2673)	(0.1665)	(0.2145)	(0.2342)
Advertising	0.2664	0.3617	0.3100	0.3506
	(0.1781)	(0.2431)	(0.2294)	(0.2840)

Table 16: T-Test of Differences Between Country Pairs
The table shows the results from a t-test between the firm characteristics for country pairs. Definition of the variables can be found in section 3.3. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively

	Norway — Sweden	Norway — Finland	Norway — Denmark	Sweden —Finland	Sweden — Denmark	Finland — Denmark	Obs
Ln(Size)	23.08***	2.90***	0.67	-20.02***	-18.60***	-1.83*	1548
Ln(Sales)	12.63***	-6.58***	-3.72***	-22.03***	-15.59***	1.95**	294
M/B	-3.31***	-1.53	-1.11	-0.72	3.14***	1.36	249
Profitability	1.18	-0.89	-1.01	-3.39***	-1.10	-0.95	211
Dividend payer	0.41	-20.11***	-3.62***	-25.12***	-4.52***	14.05***	196
Cash holdings	1.73*	4.44***	3.85***	3.61***	2.99***	0.52	93
Tangibility	20.18***	9.13***	-1.37	-11.76***	-16.26***	-8.52***	
Book leverage	4.11***	1.30	2.74***	-2.81***	-7.52***	1.23	
Capex	0.52	0.54	4.94***	0.07	0.57	0.40	
Advertising	-4.99***	-4.14***	-1.61	1.19	5.32***	3.82***	

Table 17: Industry statistics
The table reports the mean values of each firm characteristic for the respective industry. Definition of the variables can be found in section 3.3. The column HHI shows the debt specialization measured by HHI for each industry.

	HCSA	MAN	INF	PSTS	RT	ASWS	WT	AFFH	MIN	AFS	TW	CON	AER
ln Size	18.9913	18.2974	18.4763	20.3868	19.9572	18.7689	19.8588	17.8189	17.9279	18.8492	18.7221	19.3553	18.6038
ln Sales	18.4788	17.6945	18.6811	19.5930	19.4972	19.1184	20.1810	17.2650	16.7737	17.8755	18.0219	16.8103	18.6491
M/B	1.8994	2.0778	7.9402	0.5743	0.7651	0.8181	1.1079	1.4093	1.8838	1.0482	0.9465	1.7121	45.2354
Profitability	-0.0160	-0.0682	0.0164	0.0403	0.0349	0.0701	0.0791	-0.0213	-0.0401	-0.0187	-0.0480	-0.0579	0.0022
Dividend Payer	0.5106	0.4207	0.4491	0.4345	0.6077	0.4806	0.6569	0.1955	0.4098	0.4016	0.3465	0.2442	0.4731
CF Volatility	0.2516	0.1470	0.1165	0.0554	0.0726	0.0561	0.0691	0.2422	0.1795	0.0863	0.0486	0.2660	0.0635
Tangibility	0.2087	0.1161	0.0652	0.6003	0.1718	0.2193	0.1970	0.4161	0.0927	0.4120	0.3748	0.5200	0.1692
Book Leverage	0.2197	0.2423	0.2155	0.4141	0.2200	0.2470	0.2192	0.2957	0.1432	0.3222	0.5140	0.7509	0.2842
Advertising	0.2703	0.4184	0.8091	0.1883	0.1799	0.2728	0.2826	0.3833	0.6424	0.1743	0.4172	0.1748	0.8255
HHI	0.6736	0.7240	0.6658	0.6464	0.5692	0.6710	0.5970	0.7348	0.7516	0.5727	0.7633	0.7370	0.5625

Table 18: Presence of Industries in Countries
Thw table shows number of observations in each industry, and the distribution of the industry within each country

	Total observations	% Norway	% Sweden	% Denmark	% Finland
HCSA	5547	13,74%	53,56%	12,69%	20,01%
MAN	1402	16,04%	57,38%	9,12%	17,46%
INF	1201	18,32%	47,63%	9,08%	24,98%
PSTS	613	67,37%	24,07%	2,59%	5,98%
RT	556	45,86%	16,55%	25,36%	12,23%
ASWS	503	25,15%	47,13%	13,86%	13,86%
WT	480	15,63%	58,75%	5,42%	20,21%
AFFH	370	2,97%	77,30%	11,62%	8,11%
MIN	299	22,07%	29,43%	23,08%	25,42%
AFS	163	71,78%	15,95%	12,27%	0,00%
TW	159	13,84%	36,48%	49,06%	0,63%
CON	138	0,73%	74,64%	12,32%	12,32%
AER	122	0,00%	72,13%	0,00%	27,87%
OS	38	0,00%	94,74%	0,00%	5,26%
ES	25	0,00%	40,00%	0,00%	60,00%
MCE	11	0,00%	0,00%	9,09%	90,91%

Table 19: Annual Debt Specialization for Norway
This table shows the yearly average of each debt type to total debt, the HHI and DS90 for Norway

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
RC/TD	0.11	0.16	0.12	0.10	0.09	0.11	0.09	0.14	0.17	0.18	0.19	0.21	0.17	0.20	0.17	0.18	0.22	0.21	0.13	0.14	0.25
TL/TD	0.54	0.50	0.55	0.57	0.58	0.54	0.52	0.54	0.56	0.58	0.53	0.48	0.48	0.47	0.54	0.52	0.47	0.49	0.41	0.38	0.27
BN/TD	0.11	0.11	0.14	0.13	0.15	0.18	0.21	0.17	0.17	0.15	0.17	0.19	0.22	0.20	0.17	0.17	0.20	0.16	0.12	0.15	0.14
CP/TD	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CL/TD	0.05	0.03	0.03	0.08	0.07	0.09	0.12	0.08	0.06	0.05	0.06	0.06	0.08	0.08	0.08	0.09	0.08	0.10	0.33	0.32	0.33
OB/TD	0.19	0.19	0.16	0.13	0.11	0.09	0.06	0.06	0.04	0.04	0.05	0.06	0.04	0.04	0.03	0.04	0.04	0.03	0.01	0.01	0.01
HHI	0.77	0.78	0.80	0.76	0.76	0.72	0.71	0.69	0.67	0.68	0.67	0.67	0.66	0.68	0.69	0.68	0.67	0.68	0.64	0.61	0.50
DS90	0.54	0.57	0.60	0.55	0.52	0.46	0.46	0.41	0.40	0.45	0.41	0.35	0.36	0.40	0.39	0.41	0.42	0.41	0.37	0.35	0.17

Table 20: Annual Debt Specialization for Sweden
This table shows the yearly average of each debt type to total debt, the HHI and DS90 for Sweden

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
RC/TD	0.19	0.19	0.16	0.18	0.20	0.23	0.24	0.29	0.31	0.31	0.32	0.32	0.30	0.30	0.29	0.29	0.28	0.27	0.19	0.20	0.21
TL/TD	0.56	0.52	0.54	0.52	0.54	0.53	0.54	0.53	0.51	0.51	0.52	0.50	0.50	0.50	0.51	0.51	0.52	0.51	0.40	0.38	0.31
BN/TD	0.11	0.10	0.12	0.10	0.09	0.08	0.08	0.07	0.07	0.08	0.07	0.09	0.10	0.10	0.09	0.09	0.09	0.11	0.08	0.08	0.10
CP/TD	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04
CL/TD	0.05	0.06	0.05	0.08	0.07	0.08	0.07	0.05	0.06	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.05	0.07	0.28	0.29	0.28
OB/TD	0.08	0.13	0.13	0.11	0.09	0.08	0.07	0.06	0.04	0.05	0.03	0.03	0.04	0.04	0.05	0.03	0.04	0.04	0.04	0.04	0.06
HHI	0.71	0.73	0.75	0.73	0.72	0.72	0.73	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.73	0.74	0.73	0.73	0.66	0.67	0.57
DS90	0.46	0.48	0.55	0.51	0.48	0.46	0.50	0.47	0.47	0.47	0.47	0.47	0.46	0.48	0.52	0.55	0.52	0.52	0.41	0.40	0.27

Table 21: Annual Debt Specialization for Denmark
This table shows the yearly average of each debt type to total debt, the HHI and DS90 for Denmark

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
RC/TD	0.00	0.01	0.02	0.03	0.02	0.01	0.04	0.06	0.10	0.14	0.13	0.13	0.16	0.16	0.16	0.20	0.21	0.24	0.12	0.14	0.15
TL/TD	0.71	0.67	0.66	0.66	0.72	0.76	0.71	0.72	0.69	0.65	0.63	0.59	0.56	0.56	0.57	0.56	0.55	0.56	0.47	0.43	0.39
BN/TD	0.08	0.09	0.10	0.13	0.12	0.11	0.11	0.08	0.10	0.11	0.11	0.15	0.15	0.17	0.18	0.17	0.14	0.10	0.07	0.09	0.09
CP/TD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CL/TD	0.04	0.04	0.04	0.08	0.07	0.08	0.10	0.10	0.09	0.06	0.10	0.12	0.10	0.07	0.06	0.03	0.03	0.05	0.30	0.33	0.33
OB/TD	0.16	0.19	0.17	0.11	0.06	0.04	0.04	0.04	0.01	0.04	0.02	0.01	0.02	0.03	0.03	0.03	0.06	0.05	0.04	0.01	0.04
HHI	0.77	0.78	0.79	0.77	0.81	0.79	0.79	0.80	0.79	0.76	0.77	0.77	0.76	0.79	0.79	0.79	0.79	0.75	0.63	0.62	0.63
DS90	0.56	0.56	0.58	0.61	0.65	0.63	0.60	0.59	0.64	0.55	0.55	0.56	0.54	0.59	0.54	0.63	0.63	0.56	0.33	0.32	0.30

Table 22: Annual Debt Specialization for Finland
This table shows the yearly average of each debt type to total debt, the HHI and DS90 for Finland.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
RC/TD	0.00	0.00	0.01	0.03	0.03	0.05	0.06	0.09	0.11	0.10	0.10	0.10	0.12	0.13	0.13	0.15	0.15	0.16	0.11	0.12	0.16
TL/TD	0.82	0.84	0.81	0.68	0.66	0.62	0.59	0.64	0.60	0.60	0.60	0.63	0.62	0.60	0.60	0.58	0.53	0.51	0.46	0.49	0.46
BN/TD	0.06	0.08	0.09	0.08	0.11	0.11	0.11	0.09	0.09	0.09	0.10	0.11	0.11	0.11	0.13	0.11	0.10	0.09	0.08	0.07	0.06
CP/TD	0.01	0.02	0.03	0.03	0.06	0.06	0.08	0.05	0.05	0.07	0.06	0.07	0.08	0.07	0.05	0.08	0.10	0.09	0.05	0.05	0.09
CL/TD	0.02	0.02	0.01	0.09	0.10	0.10	0.09	0.08	0.09	0.09	0.08	0.05	0.04	0.05	0.05	0.05	0.09	0.11	0.28	0.24	0.21
OB/TD	0.08	0.05	0.05	0.08	0.04	0.05	0.06	0.04	0.05	0.06	0.07	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.01
HHI	0.83	0.83	0.83	0.68	0.65	0.67	0.62	0.66	0.65	0.61	0.63	0.64	0.61	0.60	0.61	0.59	0.58	0.58	0.51	0.54	0.51
DS90	0.69	0.69	0.72	0.45	0.38	0.43	0.39	0.43	0.45	0.39	0.38	0.40	0.38	0.36	0.38	0.32	0.33	0.32	0.21	0.29	0.25

Table 23: Threshold industry 30%
This table reports the share of firm-year observations that use one debt type above 30% threshold for each industry. "Total" is the sum of all share values for each industry and represents the share of firm-year observations that employ more than the respective threshold of debt from one debt type

	RC/TD	TL/TD	R&N/TD	CP/TD	CL/TD	OB/TD
HCSA	31.9672	63.9344	1.6393	0.0000	22.9508	4.0984
MAN	25.6799	65.9062	14.6377	3.2123	7.9212	5.1287
INF	21.0120	57.6329	17.4957	2.7444	12.2642	4.7170
PSTS	27.2059	54.7059	7.6471	1.7647	21.3971	5.2941
RT	36.2288	53.1780	8.4746	2.1186	19.7034	8.4746
ASWS	39.1304	47.0109	18.4783	1.3587	5.7065	8.9674
WT	23.6486	79.0541	3.0405	0.0000	9.4595	9.1216
AFFH	29.8137	81.3665	9.9379	0.0000	4.9689	0.6211
MIN	16.9435	62.9568	25.4153	0.1661	6.8106	4.3189
AFS	22.0588	73.5294	5.8824	0.0000	11.7647	2.9412
TW	7.5812	71.2996	22.3827	0.0000	15.7040	3.0686
CON	20.2000	69.2000	14.0000	3.0000	11.0000	7.6000
AER	13.6364	61.6883	16.8831	0.0000	18.8312	7.1429

Table 24: Threshold industry 60%
This table reports the share of firm-year observations that use one debt type above 60% threshold for each industry. "Total" is the sum of all share values for each industry and represents the share of firm-year observations that employ more than the respective threshold of debt from one debt type

	RC/TD	TL/TD	R&N/TD	CP/TD	CL/TD	OB/TD
HCSA	22.950820	41.803279	0.819672	0.000000	6.557377	2.459016
MAN	13.743384	49.516335	7.118087	0.803066	4.051834	3.741559
INF	13.293310	46.397942	11.749571	0.686106	9.090909	4.030875
PSTS	18.014706	42.647059	5.000000	0.073529	14.558824	3.750000
RT	19.067797	35.381356	3.601695	0.423729	10.169492	5.084746
ASWS	28.804348	31.521739	10.597826	0.000000	3.804348	5.434783
WT	8.783784	62.162162	1.351351	0.000000	5.067568	4.729730
AFFH	9.937888	53.416149	2.484472	0.000000	0.621118	0.000000
MIN	9.634551	51.495017	17.774086	0.000000	4.318937	2.823920
AFS	16.176471	65.441176	3.676471	0.000000	5.882353	0.000000
TW	5.415162	55.054152	9.927798	0.000000	5.776173	1.805054
CON	9.200000	49.600000	4.200000	1.000000	4.200000	3.400000
AER	3.246753	51.948052	11.688312	0.000000	16.233766	1.948052

Table 25: Threshold industry 90%
This table reports the share of firm-year observations that use one debt type above 90% threshold for each industry. "Total" is the sum of all share values for each industry and represents the share of firm-year observations that employ more than the respective threshold of debt from one debt type

	RC/TD	TL/TD	R&N/TD	CP/TD	CL/TD	OB/TD
HCSA	9.016393	18.852459	0.819672	0.000000	0.819672	2.459016
MAN	6.570542	30.297500	2.536959	0.073006	2.920241	2.518708
INF	7.375643	33.276158	3.259005	0.171527	7.461407	2.830189
PSTS	9.264706	30.661765	3.382353	0.000000	12.794118	3.014706
RT	9.957627	18.008475	1.906780	0.000000	2.966102	3.601695
ASWS	14.945652	20.380435	2.445652	0.000000	2.717391	2.717391
WT	2.027027	30.743243	0.675676	0.000000	1.013514	3.040541
AFFH	0.621118	31.677019	0.000000	0.000000	0.621118	0.000000
MIN	4.152824	32.225914	8.970100	0.000000	2.159468	2.325581
AFS	8.088235	45.588235	2.205882	0.000000	1.470588	0.000000
TW	3.068592	30.144404	2.888087	0.000000	3.249097	1.083032
CON	2.400000	26.800000	1.000000	0.000000	2.400000	1.800000
AER	1.298701	28.571429	9.090909	0.000000	9.740260	1.948052

Table 26: Threshold industry 99%
This table reports the share of firm-year observations that use one debt type above 99% threshold for each industry. "Total" is the sum of all share values for each industry and represents the share of firm-year observations that employ more than the respective threshold of debt from one debt type

	RC/TD	TL/TD	R&N/TD	CP/TD	CL/TD	OB/TD
HCSA	0.819672	6.557377	0.819672	0.0	0.819672	1.639344
MAN	4.398613	21.098741	1.314108	0.0	2.810732	2.190181
INF	5.317324	26.500858	1.543739	0.0	7.375643	2.315609
PSTS	5.735294	23.823529	2.720588	0.0	11.764706	2.647059
RT	8.050847	9.110169	1.694915	0.0	2.118644	2.966102
ASWS	12.228261	12.500000	0.543478	0.0	2.717391	2.445652
WT	1.013514	18.918919	0.337838	0.0	1.013514	3.040541
AFFH	0.621118	24.223602	0.000000	0.0	0.621118	0.000000
MIN	2.657807	25.249169	5.149502	0.0	1.661130	1.827243
AFS	0.735294	30.882353	2.205882	0.0	0.000000	0.000000
TW	2.888087	19.314079	1.083032	0.0	2.527076	1.083032
CON	1.000000	17.800000	0.200000	0.0	1.800000	1.000000
AER	0.649351	18.831169	6.493506	0.0	9.740260	0.649351

Table 27: Conditional Debt Structure Denmark
This table presents findings on the conditional debt structure for Denmark. To analyze this, we set a condition that the utilization of a specific debt type must exceed 30% of total debt. We calculate the average ratios of each debt type to total debt for the subset of observations that meet this condition. Definitions of the variables can be found in section 3.3.

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD	Obs
TL>30%	0.832054	0.047337	0.042065	0.055781	0.000000	0.022762	991
BN>30%	0.206090	0.681518	0.062881	0.036939	0.000288	0.012284	211
RC>30%	0.184132	0.050255	0.692760	0.062051	0.000000	0.010801	206
CL>30%	0.179772	0.020481	0.070432	0.715227	0.000000	0.014087	165
CP>30%	NaN	NaN	NaN	NaN	NaN	NaN	0
OB>30%	0.197170	0.016948	0.027617	0.030981	0.000000	0.727284	84

Table 28: Conditional Debt Structure Sweden
This table presents findings on the conditional debt structure for Sweden. To analyze this, we set a condition that the utilization of a specific debt type must exceed 30% of total debt. We calculate the average ratios of each debt type to total debt for the subset of observations that meet this condition. Definitions of the variables can be found in section 3.3.

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD	Obs
TL>30%	0.788214	0.032346	0.119864	0.040903	0.004708	0.013965	3355
BN>30%	0.164996	0.668340	0.074769	0.038145	0.028041	0.025708	657
RC>30%	0.204364	0.026414	0.697570	0.051619	0.008367	0.011666	1877
CL>30%	0.141683	0.020029	0.101595	0.721593	0.001461	0.013638	630
CP>30%	0.141907	0.185649	0.145390	0.040369	0.442105	0.044580	69
OB>30%	0.101949	0.026468	0.047901	0.034012	0.005788	0.783882	305

Table 29: Conditional Debt Structure Finland
This table presents findings on the conditional debt structure for Finland. To analyze this, we set a condition that the utilization of a specific debt type must exceed 30% of total debt. We calculate the average ratios of each debt type to total debt for the subset of observations that meet this condition. Definitions of the variables can be found in section 3.3.

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD	Obs
TL>30%	0.7812	0.0461	0.0535	0.0639	0.0344	0.0209	1548
BN>30%	0.2486	0.5386	0.0924	0.0396	0.0434	0.0372	294
RC>30%	0.2322	0.0851	0.5422	0.0636	0.0624	0.0146	249
CL>30%	0.2938	0.0176	0.0375	0.6187	0.0160	0.0164	211
CP>30%	0.2366	0.0722	0.1317	0.0427	0.5026	0.0143	196
OB>30%	0.2454	0.0381	0.0252	0.0432	0.0121	0.6360	93

Table 30: Conditional Debt Structure Norway
This table presents findings on the conditional debt structure for Norway. To analyze this, we set a condition that the utilization of a specific debt type must exceed 30% of total debt. We calculate the average ratios of each debt type to total debt for the subset of observations that meet this condition. Definitions of the variables can be found in section 3.3.

	TL/TD	BN/TD	RC/TD	CL/TD	CP/TD	OB/TD	Obs
TL>30	0.7764	0.0676	0.0822	0.0554	0.0013	0.0170	1364
BN>30	0.1743	0.6848	0.0656	0.0523	0.0030	0.0200	473
RC>30	0.2077	0.0597	0.6459	0.0753	0.0005	0.0109	474
CL>30	0.1468	0.0429	0.0832	0.7182	0.0000	0.0089	278
CP>30	0.5002	0.0000	0.0000	0.0000	0.4998	0.0000	1
OB>30	0.1095	0.0346	0.0256	0.0140	0.0026	0.8137	130

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