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The Influence of ESG Ratings on Corporate Debt Costs and Debt Ratios

Evidence from Nordic markets

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ABSTRACT :
The purpose of the thesis is to study how the ESG rating and its individual pillars (Environmental, Social, Governance) affect corporate debt costs in the Nordic countries between 2017 and 2023. The theoretical framework of the study is based on stakeholder theory, which emphasizes the responsibilities of companies towards their stakeholders and the impact of these responsibilities on the company's operations and financial performance. The thesis also examines the development of corporate social responsibility (CSR) and the role of ESG in today's financial markets.

The literature review focuses on previous studies that have examined the connection between ESG and the cost of debt. These studies have generally found that higher ESG scores can lead to lower debt costs by reducing the risk faced by companies and improving their reputation in the eyes of investors and lenders. The paper also aims to highlight the impact of ESG on the debt ratio of companies, i.e., the proportion of a company's financing that is debt-financed relative to equity.

The empirical analysis is based on a panel data set of 2009 Nordic companies and the paper used the Standard Error Pooled Regression method. The results show that ESG rating has no significant effect on the cost of debt of a firm in the Nordic countries in this dataset. However, the results suggest that companies with a higher social rating can obtain cheaper debt financing. The study also found that ESG can affect a firm's debt ratio, but that this effect also varies significantly across firms. The results of the study highlight the need for further research to examine the impact of ESG, particularly in the Nordic countries, where companies generally have high standards of corporate responsibility.

KEYWORDS: Banking, Cost of Debt, CSR, ESG, Environmental, Social, Governance, Financing, Capital markets, Nordics, Stakeholder theory

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Tiivistelmä :
Tutkielman tarkoituksena on tutkia, miten ESG-luokitus ja sen yksittäiset pilarit (Environmental, Social, Governance) vaikuttavat yritysten velkakustannuksiin Pohjoismaissa vuosina 2017–2023. Tutkimuksen teoreettinen viitekehys perustuu sidosryhmäteoriaan, joka korostaa yritysten vastuuta sidosryhmiään kohtaan ja näiden vastuiden vaikutusta yrityksen toimintaan ja taloudelliseen suorituskykyyn. Tutkielmassa tarkastellaan myös yritysten yhteiskuntavastuun (CSR) kehitystä ja ESG:n roolia nykypäivän rahoitusmarkkinoilla.

Kirjallisuuskatsauksessa keskitytään aiempiin tutkimuksiin, jotka ovat tarkastelleet ESG ja velkakustannusten välistä yhteyttä. Aiemmat tutkimukset ovat yleisesti osoittaneet, että korkeammat ESG-pisteet voivat johtaa alhaisempiin velkakustannuksiin, koska ne vähentävät yritysten kohtaamaa riskiä ja parantavat niiden mainetta sijoittajien ja lainanantajien silmissä. Tämä tutkielma pyrkii myös selvittämään, miten ESG vaikuttaa yritysten velkasuhteeseen eli siihen, kuinka suuri osuus yrityksen rahoituksesta on velkarahoitusta suhteessa omaan pääomaan.

Empiirinen analyysi perustuu paneeliaineistoon, joka koostuu 2009 pohjoismaisesta yrityksestä, ja tutkimuksessa käytettiin Standard Error Pooled Regression -menetelmää. Tulokset osoittavat, että ESG-luokituksella ei ole merkittävää vaikutusta yrityksen velkakustannuksiin Pohjoismaissa tässä aineistossa. Tulokset viittaavat siihen, että yritykset, joilla on korkeampi sosiaalinen luokitus voivat saada edullisempaa velkarahoitusta. Tutkimuksessa havaittiin myös, että ESG voi vaikuttaa yrityksen velkasuhteeseen, mutta tämä vaikutus vaihtelee merkittävästi eri yritysten välillä. Tutkimuksen tulokset korostavat tarvetta jatkotutkimukselle, joka keskittyy ESG:n vaikutusten tarkempaan tarkasteluun, erityisesti Pohjoismaissa, joissa yrityksillä on yleensä korkeat yhteiskuntavastuustandardit.

KEYWORDS: Banking, Cost of Debt, CSR, ESG, Environmental, Social, Governance, Financing, Capital markets, Nordics, Stakeholder theory

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Abbreviations

CoD	Cost of Debt
CRA	Credit Rating Agency
CSR	Corporate Social Responsibility
ESG	Environmental, Social, Governance
EU	European Union
KLD	Kinder, Lydenberg and Domini Research & Analytics, Inc
LEV	Leverage
PRI	Principles of Responsible Investing
ROA	Return on Assets
SDG	Sustainable Development Goals
SRI	Socially Responsible Investing
UN	United Nations
US	United States

1 Introduction

In recent decades, environmental, social and governance considerations have become key pillars of corporate strategy and risk management. Initially inspired by the social responsibility movement and environmental awareness, ESG has now become a crucial factor in how companies operate and how stakeholders engage with them. This development reflects a wider shift in financial markets, where sustainable practices are increasingly seen as essential for long-term profitability and risk reduction. At the same time, the role of banks as financiers has increased, as they now play a key role in assessing the projects of the companies they finance and thus contribute to the environmental performance of the various projects. With increasing pressure on financial institutions to incorporate ESG criteria into their lending practices, the interface between ESG and banking has become a critical focus area in the pursuit of sustainable development.

Over the past decades, both the United Nations and the European Union have adopted a wide range of regulations and directives related to environmental friendliness in order to achieve more sustainable development. In 1997, the Kyoto Protocol was signed with the aim of reducing greenhouse gas emissions. The countries that ratified the Protocol committed themselves to reducing greenhouse emissions to a certain level between 2008 and 2012 (United Nations, 1997). The European Union was among the ratifying countries, and to this end the EU launched the European Climate Change Programme (ECCP) to meet the commitments agreed in the Kyoto Protocol. The aim of the programme was to enable all stakeholders to contribute to reducing greenhouse gas emissions and to make the EU's climate action more effective. (European Commission, 2008).

In the 2010s, the EU created several directives to improve the environmental performance of its member countries. In 2014, the Non-Financial Reporting Directive (NFRD) came into force, requiring listed companies to report non-financial information such as environmental and social issues alongside financial information. Subsequently, to enhance the NFRD, the EU Taxonomy Regulation was created in 2019, which created a

framework for classifying environmentally sustainable financial activities (European Commission, 2019).

Although various laws and goals have obliged companies to take environmental issues into account and integrate them into their business, many companies still face many challenges. Besides business, academic research has also started to take an interest in ESG and sustainability issues and this is reflected in the increasing number of studies around the topic. Several studies have attempted to investigate the relationship between ESG factors and a firm's cost of capital (Eliwa, Aboud & Saleh, 2019; Goss & Roberts, 2011; Nandy & Lodh, 2012; Chava, 2014), but the results have not always been similar.

When companies apply for external financing, the role of banks in taking ESG issues into account becomes even more important. Under the EU's Sustainable Finance Disclosure (SFDR) Directive (European Union 2018), banks are now required to integrate ESG considerations into their decision-making. SFDR requires banks to consider and report on ESG risks. This creates a strong motivation for companies to improve their own ESG profile, since a good ESG performance can lead to more favorable loan terms. For this reason, this thesis will focus specifically on the company's interest-bearing liabilities.

1.1 Purpose of this study

The primary objective of this research is to discover out whether the Nordic companies cost of debt is affected by ESG performance. The Nordic countries have been chosen as the target area for this study for two reasons. First, there is no previous research in the existing literature on the relationship between ESG and the cost of debt in the Nordic countries. Previous studies have generally been conducted either at global or EU level, so there is no clear evidence for the Nordic countries (Eliwa et. al., 2019; Nandy & Lodh, 2012; Crifo, Diaye & Oueghlissi, 2017). However, the Nordic countries are an important economic region at EU level, so it is relevant to study the Nordic countries separately. This is a gap in the literature that this thesis aims to address. Second, the Nordic

countries generally have high ESG standards and the ESG ratings of Nordic companies are quite high on a global level. This provides an interesting opportunity to examine the impact of ESG on the cost of debt.

Secondly, the aim is to investigate whether the ESG rating of a company affects its debt-to-capital ratio, i.e. whether a higher ESG score can lead to a lower debt-to-capital ratio. This research question represents a significant research gap, according to the best available information the topic has not been extensively studied before, especially in the Nordic context. This study therefore provides a new perspective and valuable information that can serve as a basis for future research and contribute to the understanding of the impact of ESG factors on the financial structure of firms.

1.2 Research questions and hypotheses.

The primary research questions of the thesis are based on previous literature, in particular the study by Eliwa et al., (2019), which examined the impact of ESG on the cost of corporate debt at the EU level. In their study, they found evidence that higher ESG ratings can lead to lower debt costs. Previous studies have not always found evidence that a higher ESG rating lowers the cost of debt. Menz (2010) rejected the hypothesis that a higher CSR would lower interest costs. Erragragui (2018) found in his study that better environmental performance does not necessarily lower debt costs, but environmental concerns do increase debt costs.

The aim of this thesis is to draw on previous literature and research methods in a study of Nordic companies. The Nordic countries are known for their high ESG standards and are all ranked in the top ten of global sustainability rankings (Sustainable Development Report, 2024). For this reason, the Nordic countries offer a particularly interesting opportunity to explore this topic using up-to-date data.

Following the previous academic literature and the main purpose of this thesis, the first hypothesis is the following:
H1: The high ESG performance score will reduce the cost of debt in the Nordic Markets.

Since the purpose is to examine in more detail the impact of the individual pillars of ESG on the cost of debt, the following hypotheses are generated:

H2a: The high Environmental performance score will reduce the cost of debt in the Nordic markets.

H2b: The high Social performance score will reduce the cost of debt in the Nordic markets.

H2c: The high Governance performance score will reduce the cost of debt in the Nordic markets.

Alongside the cost of debt, the thesis aims to provide preliminary evidence on whether ESG affects the debt ratio of a company and thus to identify potential new research ideas on the relationship between corporate financing solutions and ESG. Evidence from previous literature suggests that higher ESG ratings have led to lower debt ratios for companies (Asimakopoulos, et. al., 2023) For this purpose, an additional hypothesis will be formulated in the thesis which is the following :

H3: A high ESG rating of a company is negatively related to its debt ratio, which means that a higher ESG score leads to a lower debt ratio.

1.3 Structure of this study

This chapter presents the structure of the thesis. This thesis has six main chapters, which contain sub-chapters. The first chapter introduces the topic and takes the reader into the

main purpose of this study. The chapter also presents the background of the thesis, the research questions and hypotheses, and the structure of the thesis.

The second chapter discusses the previously mentioned concepts in more detail and provides additional perspectives on the purpose of the thesis and the research questions. The second chapter starts with a discussion of the key literature on CSR, ESG, and responsible investing. The aim is to use the existing literature to examine how ESG has evolved as a concept to its current form. This will be followed by a discussion of the key concepts related to different corporate debt solutions. After second chapter, the third chapter focuses on the previous literature on the impact of ESG on the cost and terms of a debt. The chapter reviews the previous literature on the topic and highlights previous findings related to the research questions.

After the literature review, the thesis describes the data and methodology that will be used in the thesis. In this chapter, descriptive statistics are also presented to illustrate the data. The methodology chapter presents the regressions used in the thesis and the variables of the regressions.

Finally, the last chapter presents the results of the empirical regression analysis and outlines the conclusions. Any limitations of the study are also discussed and suggestions for future research are made.

2 Theoretical framework and definitions

This section presents the main concepts of the thesis and related literature. The main concepts of the thesis are CSR development and history of ESG, and the corporate debt solutions First, the CSR, history of ESG, and the role of ESG in modern finance is presented. This is followed by a discussion of the corporate debt solutions and an introduction to the main debt instruments used by companies.

2.1 Corporate social responsibility development and stakeholder theory

Corporate social responsibility (CSR) and ESG are not new concepts, but over the years their importance in companies' business environment has increased significantly. Corporate social responsibility refers to the way in which a company takes into account various sustainability issues in its operations, its financing or its ownership structure. The debate on corporate social responsibility has been going on for decades and one famous contribution came in 1970 when Milton Friedman wrote in the New York Times Magazine about corporate social responsibility. According to Milton Friedman (1970), the only social responsibility of a corporation is to maximize profits for its shareholders, but this maximization must take place within the framework of law and ethics. Friedman argues that the responsibility for solving social problems lies not with corporations but with governments and individuals. In his view, there is a negative relationship between corporate social responsibility and economic performance, because behind business there is always a businessman pursuing his own interests, and efforts to promote responsibility impose additional costs on business. (Friedman, 1970).

Friedman's arguments generated a debate on corporate social responsibility and were generally accepted. However, the 1980s saw the development of stakeholder theory (Freeman, 1984). The theory emphasizes that companies should consider not only their shareholders but also all the other stakeholders with whom they interact in their decision-making and operating practices. Thus, according to the theory, whereas in the past

a company has only considered shareholders in its decisions, the theory suggests that it should consider employees, customers, suppliers, the community and the environment. The theory was a major factor in the development of CSR thinking, as one of its key theoretical ideas is that companies need to consider a wider range of interests and thus balance the needs and expectations of different stakeholders. Additionally, the theory emphasizes management's role. According to the theory, the company is no longer accountable only for the financial performance to its shareholders, it extends the company's responsibility to the various concerns of its stakeholders, thus increasing the ethical responsibility of management. The third key theoretical perspective is long-term value creation. According to Freeman, addressing the needs of stakeholders can lead to long-term success (Freeman, 1984).

Whereas Freeman's (1984) work can be seen as the foundation of stakeholder theory, Donaldson and Preston (1995) made a key contribution to stakeholder theory with their work. They divided stakeholder theory into three main categories: the descriptive perspective, the instrumental perspective and the normative approach. The descriptive perspective describes how a firm operates and interacts with its stakeholders. According to Donaldson & Preston (1995), describing the firm as a network of stakeholders is a more accurate model than the traditional model where the firm is seen only as a transformer of resources into products and services.

The instrumental perspective refers to the impact of stakeholder engagement on the performance of the company. This perspective is based strongly on Freeman's (1984) idea that taking stakeholders into account can lead to the long-term success of a company. According to Donaldson and Preston (1995), taking stakeholders' needs into account can lead to better financial results and hence, for example, improve a company's profitability or increase its growth. However, it should be noted that there is no comprehensive empirical support for this argument. (Donaldson & Preston, 1995).

The third and final perspective, the normative perspective, refers to the moral and ethical obligations of the company towards its stakeholders. According to Donaldson and Preston, the interests of stakeholders should be considered as independent and valuable, and not just as a tool to promote own interests. This way of thinking emphasizes that a company's decision making should consider the interests of all stakeholders and include morals and ethics in the decision-making process. (Donaldson & Preston, 1995).

The works of Freeman (1984) and Donaldson & Preston (1995) have had significant contributed significantly to the development of CSR and broadened the perspective on the roles and responsibilities of companies. Key aspects of the stakeholder theory have also been reinforced with new perspectives and ways of thinking later on. Elkington (1998) underlines the concept of the triple bottom line, which refers to the importance of balancing economic, environmental and social objectives. This approach strengthens the stakeholder theory developed by Freeman (1984), as both approaches emphasize the importance of taking into account the interests of multiple stakeholders. The triple bottom line has strengthened corporate social responsibility and shaped business strategies towards sustainability and has since become a key concept in the field of corporate responsibility and sustainable business. Like stakeholder theory, it drives companies to consider environmental and social impacts in addition to economic objectives. (Elkington, 1998).

Freeman’s (1984), Donaldson’s & Preston’s (1995), and Elkington's (1998) theories and approaches have set the direction for corporate social responsibility, and during the past decades, corporate business strategies have evolved significantly in the direction of taking social and environmental factors into account. Porter and Kramer (2011) complement the theoretical framework of CSR with their work "Creating Shared Value (CSV)", which emphasizes the ability of companies to create economic value while delivering significant social and environmental benefits. CSV attempts to integrate societal needs into the main activities of companies, thus benefiting both business and society. One of the key ideas behind this concept is the fact that companies can create value for

themselves and for society by developing products and services that meet societal needs. Another key idea behind the concept is to improve the operating environment. According to the CSV, companies should invest in social infrastructure, such as education and training, to improve their competitiveness in the long term. Lastly, the CSV says that companies should focus on partnerships that can achieve socially significant results. These partnerships include the public sector and NGOs. (Porter & Kramer, 2011).

As can be seen, CSR thinking has evolved significantly over the decades. Where Friedman (1970) argued that the only role of a company is to generate profits for its shareholders within the framework of law and ethics, it has been challenged by Freeman's (1984) stakeholder theory. This theory gained wide popularity and was further developed by Donaldson and Preston (1995) when they extended the theory to a descriptive, instrumental and normative perspective by emphasizing the positive effects of stakeholder consideration on economic performance. Elkington's (1998) triple bottom line integrated economic, environmental and social objectives, and Porter and Kramer (2011) deepened CSR thinking with their "Creating Shared Value" (CSV) concept, which integrates social needs into core corporate strategies. These theories have significantly shaped the evolution of CSR, guiding companies to consider a wider range of social and environmental factors in their business strategies and promoting sustainable business.

2.2 ESG

ESG as a term and concept is well accepted in today's financial world and drives many activities of companies and other stakeholders. The history and origin of ESG is strongly linked to the emergence of CSR thinking, as at the same time investors and other stakeholders started to pay attention to the impact of companies on the environment and society, and later also to corporate governance. The term ESG refers to three different individual pillars: environmental, social and governance. The environmental pillar focuses on the environmental impacts of companies, such as the emissions they produce and how they use natural resources. The social pillar, on the other hand, focuses on the

social impacts of the company, such as workers' rights, working conditions and respect for diversity. The governance pillar refers to the company's corporate governance practices, such as management and compensation policies. Today, ESG criteria have a major influence on investment decisions and sources of finance and thus contribute to guiding today's business and economy.

ESG was officially launched in 2004 by the UN in its report "Who Cares Wins" and was supported by the Swiss government (United Nations, 2004). The key message of the report refers to the idea that in a global world, ESG issues are a central part of companies' overall operations and should be given more attention. The report justifies the importance of ESG issues by arguing, for example, that companies that manage ESG issues can increase shareholder value by managing risks more effectively and entering new markets. Moreover, ESG has a significant impact on corporate reputation and branding. In addition to the topics affecting the company's operations, the report makes recommendations to various financial market participants such as analysts, investors, asset managers and regulators, encouraging them to integrate ESG into their own policies and investment processes. (United Nations, 2004).

Two years later, the UN launched in 2006 the Principles for Responsible Investment (PRI) at the New York Stock Exchange. The PRI's mission is to create an efficient and sustainable global financial system that focuses on those entities that act in a long-term, responsible manner and benefit the environment and society. The PRI aims to promote responsible investment and to integrate the previously launched ESG factors more strongly into investment practices and investment decisions. The number of investment institutions signing up to the PRI has grown significantly over the years and today more than 4,000 organizations have signed up to the PRI. Key aspects of the PRI are the integration of ESG into investment analysis and investment decision-making processes, and increased transparency on environmental, social and governance issues. The figure below illustrates how the PRI has evolved over its existence. (United Nations – PRI, 2021).

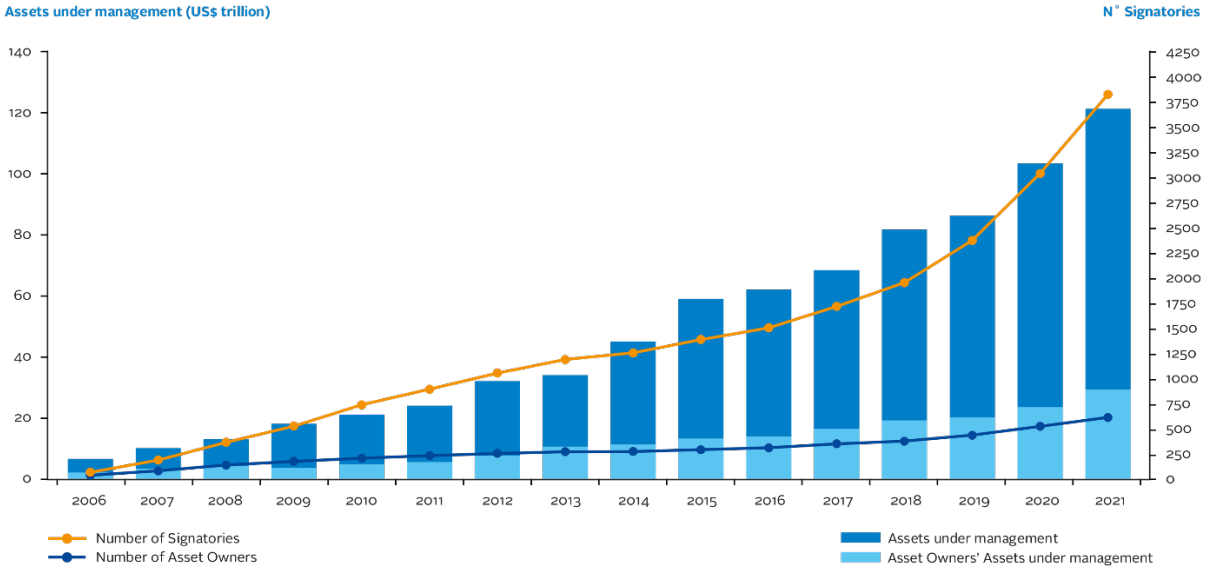

Figure 1. PRI Growth 2006-2021 (UN PRI, 2021).

2.2.1 Sustainable Development Goals (SDG)

In 2015, United Nations presented the "Agenda 2030" and as part of it the Sustainable Development Goals (SDGs) to eliminate poverty, protect the environment and ensure better well-being for everyone globally by 2030. There are a total of 17 different goals, all strongly linked to the different individual pillars of the ESG. The table below shows all 17 SDGs.

Table 1. United Nations Sustainable Development Goals (SDGs). United Nations (2024).

The SDG has a significant impact on the ESG concept as most of the goals are directly linked to one of the pillars. Goals linked to the environmental pillar are climate action (SDG 13), life under water (SDG 14) and life above ground (SDG 15). These are strongly linked to environmental protection and guide companies towards sustainable development. Goals related to the social pillar include the goals of good education (SDG 4), gender equality (SDG 5) and economic growth (SDG 8). These goals aim to improve corporate social responsibility. A complementary goal to the governance pillar is peace, justice and good governance (SDG 16). ESG and SDG are significantly linked, as ESG enables companies to measure and report on their own performance in achieving the SDGs, and in addition, companies which have successfully integrated ESG into their strategy also contribute towards meeting the SDGs and creating positive outcomes for society. (United Nations, 2024).

2.2.2 ESG ratings

Today, more and more companies have an ESG rating from at least one ESG classifier. The number of ESG ratings has increased significantly in the 2010s and ESG ratings are also available from a variety of sources. Although this thesis uses the ESG ratings from the Refinitiv Eikon ASSET4 database, it is still worth looking at the ratings from other operators and possible differences in ESG ratings. This will help to understand the heterogeneity of ESG ratings.

Depending on the service provider used, there are significant differences between ESG ratings. According to Boffo & Patalano (2020), this variation is the result of different assessment frameworks, measurement methods, key indicators, qualitative assessments and weightings. The correlation in ESG ratings between different providers is low, making it challenging for investors to make consistent decisions. Boffo and Patalano (2020) discuss in their paper the main ESG providers including MSCI, Bloomberg, Thomson Reuters, and compared the differences between the different providers. Thomson Reuters assesses companies' ESG performance on a scale of 0-100 on ten different themes, using publicly available data and covering over 15,000 companies. Bloomberg provides ESG

ratings for over 11,800 companies and uses publicly available data to analyze ESG scores on a scale of 0-100. Meanwhile, MSCI uses a seven-point scale between AAA (best) and CCC (worst) and provides ratings on more than 8,500 companies globally. The figure below illustrates the differences in ESG metrics between Thomson Reuters, MSCI and Bloomberg. (Boffo & Patalano, 2020).

Pillar	Thomson Reuters	MSCI	Bloomberg
Environmental	Resource Use	Climate Change	Carbon Emissions
	Emissions	Natural resources	Climate change effects
	Innovation	Pollution & waste	Pollution
		Environmental opportunities	Waste disposal
			Renewable energy
			Resource depletion
Social	Workforce	Human capital	Supply chain
	Human Rights	Product liability	Discrimination
	Community	Stakeholder opposition	Political contributions
	Product Responsibility	Social opportunities	Diversity
			Human rights
			Community relations
Governance	Management	Corporate governance	Cumulative voting
	Shareholders	Corporate behaviour	Executive compensation
	CSR strategy		Shareholders' rights
			Takeover defence
			Staggered boards
			Independent directors
Key metrics and submetrics	186	34	>120

Table 2. ESG criteria differences between major ESG ratings providers (Boffo & Patalano, 2020).

Berg, Kölbel and Rigobon (2022) examined the differences in ESG ratings between six major rating agencies, namely KLD, Sustainalytics, Moody's ESG, S&P Global, Refinitiv and MSCI. According to the study, there is considerable variation in the results of ESG ratings by different rating agencies and the variation is mainly due to three factors: measurement, scope, and weighting. Of these, measurement variance refers to differences in measurement methods between different rating agencies and measurement methods explain 56% of the variance. Scope variance refers to the fact that not all raters include an identical number of ESG attributes in their assessments and this explains 38% of the variance. Weighting variance refers to the importance given to

different ESG attributes and these weighting differences explain 6% of the variance. (Berg et. al., 2022).

Pillal, Islam, Sreejith and Al-Malkawl (2023) studied differences in ESG ratings using Sustainalytics 2022 data on 13 598 companies from around the world using comparability analysis, Kruskal-Wallis test and Mann-Whitney test. The study found that regions such as Asia and the Americas emerged as high ESG risk regions while European companies were lower in ESG risk. There were also differences in ESG riskiness across industries. This study is reportedly the first of its kind and highlights that using only one rating agency for ESG ratings can create a subjective bias. (Pillal et. al., 2023).

2.2.3 The role of ESG in today's finance

The importance of ESG in today's finance is significant and more and more studies are integrating ESG in order to understand the impact of ESG on different financial phenomena. Several studies have tried to find evidence on how ESG or CSR issues affect company performance. In their paper, Lins, Servaes and Tamayo (2017) examined how corporate CSR affected firm performance during the financial crisis and found evidence that higher CSR allowed for better returns on stock, better profitability and growth, and were more trusted by stakeholders. The study shows that investing in CSR activities pays off, especially in times of confidence crises. Similarly, Lee, Cin and Lee (2016) in their paper studied how corporate environmental responsibility affected the financial performance of a firm using return on equity (ROE) and return on assets (ROA) as performance measures. The study found a statistically significant positive relationship between environmental responsibility and ROA and ROE (Lee et. al., 2016).

Besides companies, research has also investigated how ESG issues affect the performance of funds. El Ghoul and Karoui (2022) examined the impact of socially responsible investment on the performance of investment funds. They found evidence in their study that more socially responsible funds outperform, but on the other hand, they also found

mixed evidence depending on the measurement method. However, they found that socially responsible funds have lower risk, thus socially responsible behavior can reduce the risk of the fund. On the other hand, Hartzmark and Sussman (2019) analyzed how ESG affects fund valuation and returns. The study found no evidence that a better ESG rating leads to better returns in all cases. However, ESG does influence investor behavior, but the effect is not unequivocal. This finding underlines the need to improve the consistency and transparency of ESG ratings.

Alongside these topics, the impact of ESG on the financial world has also been widely studied from other perspectives. An important area of research for this thesis is the impact of ESG on the cost of capital, in particularly on debt, and this is discussed in more detail in the literature review (Chapter 3).

2.3 Corporate Debt Solutions

This chapter discusses the most common corporate debt instruments and presents their main features. Debt is almost always a necessary source of finance for companies, as when a company needs to raise finance for its operations, the options are either internal or external financing. There are often situations where internal financing is not available, and companies must rely on external financing, i.e. debt. Companies can raise debt finance either through bonds on the market or by borrowing from banks. Banks play an important role in the granting of debt capital, so the purpose of this section is to look in more detail at bank loans. Furthermore, in order to provide a holistic understanding of the debt capital market, this thesis will also discuss bonds and credit ratings, which have a significant impact on a firm's access to debt capital.

2.3.1 Bank Loans

When a company is raising finance, a bank loan is one of the most popular sources of funding. According to studies conducted by the European Central Bank, bank loans are

an important source of finance for euro area companies, especially SMEs. A survey conducted by the ECB in 2021 found that 31% of large and 23% of medium-sized companies used bank loans as a source of funding. (European Central Bank, 2021). According to statistics from the European Bank Federation (2022) in 2021, the total value of loans held by EU MFIs increased by 13% in 2021 to around €26 trillion, the highest level since 2012.

Many factors influence the amount of bank loans, and the amount of credit banks give out. Companies that seek bank finance do not always get it. This is because banks carefully assess the creditworthiness and solvency of borrowers, and a weak financial situation or high credit risk can lead to a loan application being rejected. Banks' lending standards are shaped by macroeconomic conditions, which can change rapidly during economic crises. The COVID-19 pandemic contributed to the global economic crisis and the European Central Bank reported that the pandemic caused significant tightening of bank lending in 2020. Bank lending policies and risk tolerance were expected to tighten further in the first half of 2021. Tighter lending policies will be reflected in the available bank funding and its price, in other words interest rates. (European Central Bank, 2021b).

Academic literature supports the European Central Bank's statistics on bank lending during the COVID-19 pandemic, as there is evidence from previous literature on the impact of financial crises on bank lending. In their sturdy, Puri, Rocholl and Steffen (2011), examined the impact of the financial crisis through global lending using loan data from German savings banks for the period 2006-2008. The results showed that banks affected by the crisis rejected more loan applications and restricted their lending, especially in small and liquidity-constrained banks. However, bank-depositor ratios helped to mitigate these effects. The results suggested that banks reduced lending to maintain liquidity and protect their financial position. (Puri et. al., 2011).

De Fiore and Uhlig (2011) examined the differences between bank and bond finance in the US and Europe. They find that banks play an important role as a source of finance for companies, especially in the euro area, where bank loans account for a significant

share of corporate debt financing. Companies value banks' flexibility in financing solutions, and companies can obtain loans tailored to their needs. The importance of bank finance is particularly important when public information on the creditworthiness of a firm is limited, as banks are able to obtain detailed information on the firm which reduces asymmetric information. The study therefore recommends that the regulation of financial markets should take into account the role of banks as information intermediaries. (De Fiore & Uhlig, 2011).

There are situations where a bank loan is too big or carries too much risk for one lender and this requires several banks on the lending side. A financial arrangement where several banks participate in making a single large loan to a borrower is called a syndicated loan. The syndicated loan process starts when the borrower pays an arrangement fee to either one or more of the leading banks that arrange the syndication of the loan. The lead banks are responsible for pricing the credit and for marketing it to other banks. The lead banks may also guarantee the part of the credit that could not be sold on to other banks. (Brealey, Myers & Allen, 2020).

2.3.2 Corporate Bonds

When discussing the long-term interest rate market, it typically refers to bonds. A bond represents a significant loan that is divided into multiple smaller loans with identical terms. Bonds can be traded both on stock exchanges and over-the-counter markets. It's important to recognize that bonds are marketable, meaning they can be bought and sold between the issuance and the repayment period (Knüpfer & Puttonen, 2018). Alongside bank loans, bonds serve as a crucial source of external financing, and they are particularly prevalent in the US, where companies often utilize bonds for funding (De Fiore & Uhlig, 2011).

In the euro area, one important reason for the growth in the corporate bond market is the European Central Bank's Corporate Sector Purchase Programme (CSPP), which was launched in 2016. The CSPP is a monetary policy instrument of the European Central

Bank that aims to buy corporate sector bonds to support corporate financing while improving the transmission of monetary policy effects to the real economy. Corporate bonds that are "investment grade" are classified as CSPP-eligible and by the end of 2022 the amount of CSPP-eligible bonds was EUR 1.5 trillion. (European Central Bank, 2023).

The pricing principles for bonds are similar to other securities. In bond pricing, expected cash flows are discounted to the present using a specified discount rate. The price of a corporate bond is influenced by a number of things, such as maturity, general interest rates and the credit rating of the issuer. Since the general risk-free market rate is, for example, a 10-year government bond, a corporate bond carries a higher risk, and therefore usually a higher required return. The formula for pricing a bond is as follows:

$$P_0 = \frac{C}{1+r} + \frac{C}{(1+r)^2} + \cdots \frac{C}{(1+r)^n} + \frac{PV}{(1+r)^n}, \quad (1)$$

The term P_0 refers to the current price of the bond, while *C* indicates the coupon payments, *PV* is the bond's par value, *r* denotes the discount rate, and *n* represents the number of periods. This formula helps to calculate how much investors are prepared to pay the company in exchange for the expected interest payments and the bond's face value at maturity (Knüpfer & Puttonen, 2018).

There are different pricing models for bonds, ranging from fixed-rate bonds to zero-coupon bonds. Fixed-rate bonds are when the issuer pays the investor a regular and fixed total payment throughout the entire lifetime of the loan and the face value of the loan is repaid at maturity. With floating rate bonds, interest payments are linked to an agreed market rate and thus interest payments can change in line with general interest rates. However, floating rate bonds usually have a certain interest margin added to the market rate. There are also bonds where the issuer can repay part of the face value of the bond before maturity, thus reducing the investor's risk. Another relatively rare example is zero-

coupon loans, where no interest payments are made over the life of the loan and the investor receives a profit on the difference between the face value and the market price at maturity. (Knüpfer & Puttonen, 2018).

Corporate bonds differ somewhat from government bonds, although they are very similar instruments in terms of functionality. One significant difference is the spread differences between corporate bonds and government bonds. According to Elton, Gruber, Agrawal and Mann (2001), the differences are due to several factors. In their paper, they investigated the differences in bond spreads and attempted to explain the differences in spreads. In their paper they highlight three main key factors which are the expected credit loss, the tax premium and the risk premium. Expected credit loss refers to the fact that some corporate bonds remain unpaid, and investors demand a higher interest rate as compensation. The tax premium arises because interest income on corporate bonds is subject to state tax, while government bond yields are tax- free. The risk premium refers to the higher risk perceived by investors in corporate bonds. (Elton et. al., 2002).

The research explains in more detail the role of the risk premium and suggests that expected credit losses explain only part of the interest rate premiums on corporate bonds compared to government bonds. According to the study by Elton et. al., (2001), a large part of interest rate differentials is caused by systemic risk, i.e. market risk, which is the same as the risk premium for equities. Therefore, the variation in corporate bond yields is linked to wider market risks for which investors are seeking compensation. (Elton et. al., 2001).

Taxes also have a very important impact on interest rate spreads on corporate bonds, as corporate bonds are taxable, which increases their yield requirement. According to Elton et al., (2001) the combination of taxes and expected credit losses does not completely explain the differences in spreads observed, and hence the importance of the risk premium is emphasized. The study also found that interest rate spreads on corporate bonds vary as expected by credit rating and maturity. (Elton et. al., 2001).

2.3.3 Green Bonds

Alongside conventional bonds, a whole new concept of "green bonds" has emerged. The fundamental idea behind green bonds is to steer funding towards projects that contribute to sustainable development. Hence, green bonds are a way to finance environmentally friendly projects and have grown significantly in popularity in recent years. According to Flammer (2021), Green bonds have become more common, especially in industries where environmental issues are economically significant. There has also been significant growth over the past 10 years with total green bond issuance reaching $5 billion in 2013 and $95.7 billion in 2018. Flammer (2021) has found evidence that the stock market reacts positively to green bond issuance, especially by first-time issuers. Green bond issuance also acts as a way for companies to improve their own environmental performance, and at the same time is able to attract long-term investors better than conventional bond issuers. (Flammer, 2021).

As green bonds have grown in popularity, regulations and standards have also emerged to ensure that funds are allocated to environmentally friendly projects. One of the most widely accepted and used standards is the International Capital Market Association's (ICMA) Green Bond Principles (GBP). The GBP defines four key components for green bonds: purpose, project evaluation and selection, asset management and reporting. These components are designed to ensure that green bond funds are used for clearly defined environmental projects such as renewable energy, energy efficiency or waste management. Bond issuers must also be able to explain and evaluate the projects for which the bonds are issued, and the funds for the bonds must also be segregated or separated from other funds so they can be tracked to ensure that they are used for the right projects. Furthermore, loan issuers should report regularly on the use of funds. (International Capital Market Association, 2022).

The Green Bond Principles define the categories of projects that are eligible for green bond financing. These projects must promote environmental sustainability and allow

green bonds to target funding to projects that support environmental sustainability. Such projects include:

- Renewable energy
- Energy efficiency
- Pollution prevention and control
- Environmentally sustainable management of living natural resources.
- Terrestrial and aquatic biodiversity
- Clean transportation
- Sustainable water and wastewater management
- Climate change adaptation
- Circular economy adapted products, production technologies and processes.
- Green buildings

(International Capital Market Association, 2022).

2.3.4 Credit Ratings

Credit rating agencies (CRAs) play an important role in the global financial system by evaluating the creditworthiness for debt securities issuers. There are many credit rating agencies globally, but when it comes to the largest and most important agencies, they are Fitch, Moody's, and Standard &Poor's. These agencies play critical roles in minimizing information asymmetry between borrowers and lenders by providing important details about credit. This role plays an essential role in helping investors to make informed choices regarding loan and investment possibilities.

Corporate bank loans and bonds always carry a risk and therefore an interest margin is applied to the loan in addition to the market rate. The margin on the loan is determined according to the risk level of the company and can also be called the risk premium. Thus, investors and banks must set a risk premium for the loan that reflects the riskiness of the company. To assess risk, international credit rating agencies are used to compare a company with others, provided the company has a public credit rating. Banks also conduct

their own internal ratings of companies based on their analysis, but these ratings are not publicly disclosed. Additionally, banks are often reluctant to share these internal ratings with competitors. (Knüpfer & Puttonen, 2018).

The table below shows the ratings of the three largest credit rating agencies. The ratings are roughly divided into two parts "Investment Grade" which indicates that the company's credit rating is such that it does not contain high risk. Similarly, "Speculative" grade credit ratings refer to higher-risk companies. Additionally, Standard and Poor's and Fitch have a "Default" category, which includes companies that have filed for bankruptcy, are in insolvency or are otherwise no longer viable to operate.

Credit Rating Agency	**Standard and Poor's**	**Fitch**	**Moody's**
Investment Grade	AAA	AAA	Aaa
	AA	AA	Aa
	A	A	A
	BBB	BBB	Baa
	BBB-		
Speculative	BB+	BB	Ba
	BB	B	B
	B	CCC	Caa
	CCC	CC	Ca
	CC	C	C
Default	C	RD	
	D	D	

Figure 2. Main credit rating agencies and ratings (S&P Global 2022, Fitch 2023 & Moody's 2024).

Credit rating agencies have a history spanning over 100 years, with the first major public credit rating agency established in 1909 by John Moody. This was followed by the establishment of Poor's, Standard Statistics, and Fitch in the subsequent decades. Throughout

the 20th century, the role of credit rating agencies evolved as bank regulators started requiring banks to invest only in safe securities, with the safety of these securities being assessed by the rating agencies. In the 1970s, the role of these agencies was further solidified when the SEC created the 'Nationally Recognized Statistical Rating Organization' (NRSRO) category, which included Moody's, Standard & Poor's, and Fitch. These agencies have since dominated the market, making it challenging for new entrants to establish themselves. This market dominance is further reinforced by practices and regulations set by the SEC and other regulators (White, 2010).

3 Literature review

The literature review focuses on the previous literature on the relationship between ESG and the cost of capital. Although this paper focuses on the relationship between ESG and the cost of debt, it is also useful to discuss the cost of capital at a more general level. A significant number of related studies have been carried out using different methodologies and datasets and the results have varied considerably between studies. This is why the aim is to cover a range of studies from different time periods in order to get as good a picture as possible of the results of previous studies. The table below summarizes the previous studies and their results. The table is followed by a more detailed discussion of the results.

Author(s)	Year	Region	Sample Period	Summary of Findings	CoD / CoE
Eliwa, Aboud & Saled	2021	EU	2005-2016	Stronger ESG score leads to lower cost of debt	CoD
Hoepner, Oikomomou, Scholtens & Schröer	2016	Worldwide	2005-2012	One-unit increase in a country's sustainability score results in an average 64 basis point decrease in the cost of debt.	CoD
Crifo, Diaye & Oueghlissi	2017	Worldwide	2007-2012	High ESG scores leads lower loan costs/bond spreads	CoD / Bond
Goss & Roberts	2011	USA		Firms with social responsibility concerns pay 7-18 basis points more for their loans	CoD
Nandy & Lodh	2012	USA	1991-2006	Companies that are more environmentally friendly receive more favorable loan contracts	CoD
Erragragui	2018	USA	2000-2011	Environmental concerns increase the cost of debt for firms	CoD
Chava	2014	USA	1992-2007	Private lenders take into account the environmental concerns of companies, which in turn leads to the higher cost of debt	CoD
Menz	2010	EU	2006	Rejects the hypothesis that better CSR has a negative effect on credit interest rates	Bond
Hasan, Hoi, Wu & Zhang	2017	USA	1990-2012	Firms headquartered in counties with higher social capital have lower cost of debt	CoD
El Ghoul, Guedhami, Kwok & Mishra	2011	USA	1992-2007	Higher CSR rating leads cheaper equity financing. However, not all CSR activities reduce the cost of equity.	CoE

Table 3. Table of empirical findings from prior literature.

3.1 Findings from previous literature between ESG and the cost of capital

The relationship between the cost of capital and sustainability factors has been studied extensively over the past decades in various studies. The purpose of this section is to discuss previous literature and various research findings on the relationship between the cost of capital and sustainability factors. While the empirical section of the thesis focuses specifically on the relationship between the cost of debt, i.e. bank loans, and sustainability factors, this section also discusses the cost of equity. It is important to understand the factors affecting the cost of capital as comprehensively as possible, as a company's capital is ultimately made up of both debt and equity, and both have costs associated with them.

Several previous studies have found positive effects of ESG on reducing the cost of debt. Eliwa et al. (2019) studied the relationship between the cost of corporate debt in Europe and the ESG performance score and the ESG disclosure score and found that the ESG performance score and the ESG disclosure score have an equal impact on reducing the cost of debt. They also provide evidence that countries with a higher degree of stakeholder orientation have a higher impact of the ESG score on reducing the cost of debt. The research excluded financial companies from the sample and included 14 EU countries and Norway, as Norway has very similar accounting standards to EU countries. Furthermore, in their study they distinguished between ESG disclosure and ESG performance and found that both play an equal role in the cost of debt. They used legitimacy and institutional theories as a framework in their paper to examine regional differences in their results in more detail. (Eliwa et. al. 2019)

In their paper, Crifo, Diaye & Oueghlissi (2017) examine how ESG affects the spread of government bonds. They conducted the study over the period 2007-2012 and the sample of the study included 23 OECD countries. Using a panel regression model, they found that ESG ratings significantly lower government bond spreads. Their results show that high ESG scores lower loan costs. However, in absolute terms, the impact of ESG scores

on government borrowing costs is about three times weaker than the S&P financial ratings on government borrowing costs. (Crifo et. al., 2017).

Goss & Roberts (2011) studied how corporate social responsibility in the US affects the price of bank loans. Using a single equation regression model, they find that firms with social responsibility concerns pay 7-18 basis points more for their loans. They conclude that the results suggest that banks consider companies with lower CSR to be riskier and thus offer worse loan terms, while companies with higher CSR are considered less risky and rewarded with better loan terms. (Goss & Roberts, 2011).

In previous literature, studies examining the relationship between the sustainability profile of US firms and the cost of debt have widely used the Kinder, Lydenberg and Domini Research & Analytics, Inc (KLD) database. Nandy & Lodh (2012) studied how banks consider the environmental awareness of companies in their lending decisions. The study analyzed all US firms included in the KLD Social Performance Database from 1991 to 2006. The results of the study show that companies that are more environmentally friendly receive more favorable loan contracts. They conclude that the study has a significant societal impact, because when companies seek better loan deals through environmentally friendly practices, society as a whole benefits. (Nandy & Lodh, 2012).

Erragragui (2018) used the CSP (Corporate Social Performance) indicator in his study to examine how corporate responsibility affects credit risk and loan costs. Using the KLD social ratings in his research, he examines selected elements of the ratings that have been found to have an operational impact on firms' performance. In his results, he finds that few firm evaluation factors matter for creditors' perception of firm risk. The results also show that environmental concerns increase the cost of debt for firms, while governance concerns do not significantly affect debt costs. Furthermore, the results of Erragragui's study show that environmental and governance concerns also have a downward effect on the cost of debt for a firm. Thus, he concludes that the results point to

"governance paradox" because negative governance issues do not matter as much to creditors as positive ones. (Erragragui, 2018).

Previous literature has also examined the impact of ESG on the cost of capital in terms of equity. El Ghoul, Guedhami, Kwok & Mishra (2011) studied the impact of ESG issues on the cost of capital, more specifically to estimate the upfront cost of equity. In a study of a large sample of US companies, they found that higher CSR ratings lead to cheaper equity financing. They used the KLD Social Performance Index in their study and found that not all six dimensions of the index are associated with a reduction in the cost of capital, however, as corporate social responsibility activities in the areas of community relations, diversity and human rights do not reduce the cost of capital. In addition, they confirm findings related to previous literature (Hong & Kacperczyk, 2009) that participation in the tobacco and nuclear industries increases the cost of capital. (El Ghoul et. al., 2011).

However, there are studies that provide conflicting evidence on the impact of environmental issues on a firm's cost of capital. Chava (2014) examines how the environmental profile of a firm affects its cost of capital, both debt and equity. He also utilized the KLD's company-level environmental profiles to research how equity investors and private lenders take into account a company's environmental profile. He finds that private lenders take into account the environmental concerns of companies, which in turn leads to the higher cost of debt. However, he also shows evidence that a company's strong environmental profile does not lead to significantly lower costs. In contrast, private lenders still provide more favorable loans to companies whose revenues come from products that are environmentally friendly. (Chava, 2014).

Previous research has also shown the opposite results regarding the relationship between CSR and the cost of debt. According to Menz (2010), his study rejects the hypothesis that better CSR has a negative effect on credit interest rates. His paper studied the relationship between the valuation of European corporate bonds and the CSR rating of

European companies, and the results suggest that, despite the assumption, the risk premium of responsible companies was higher than that of non-responsible companies. One conclusion he draws is that debt investors value corporate credit ratings more than corporate CSR ratings. He argues that credit ratings already partly take into account environmental, social and governance issues and therefore a separate CSR rating does not add more value for debt investors. (Menz, 2010).

Hasan, Hoi, Wu & Zhang (2017) in their paper studied how the location of corporate headquarters affects the cost of debt. They looked at US counties and the social capital of the counties and tested whether the social capital of the county has an impact on the cost of debt of the firm. The results of the research found that firms headquartered in counties with higher social capital have lower cost of debt. They confirmed the causality of the results by analyzing firms that have relocated to counties with higher social capital. In addition, the robustness of the results was verified by using organ donation as an alternative measure of social capital and thus the results are independent of tax avoidance or religiosity. Moreover, according to their research, banks not only offer cheaper loans, but also provide better overall loan conditions by requiring less strict collateral. (Hasan et. al., 2017).

Previous literature has similarly examined how country-specific and company-specific CSR factors affect the costs of bank debt. In their paper, Hoepner, Oikonomou, Scholtens & Schröder (2016) internationally studied 470 different loan contracts from 28 different countries between 2005 and 2015 to examine the relationship between corporate and country sustainability on bank loan costs and in their study, they found evidence that country social and environmental factors have a significant statistical impact on the cost of financing. They find that a one-unit increase in a country's sustainability score results in an average 64 basis point decrease in the cost of debt. However, they find no evidence that firm-level sustainability has the same impact on the cost of bank loans as country-level sustainability. (Hoepner et. al., 2016)

Previous findings suggest that sustainability factors can have a significant impact on the cost of debt and equity of a firm. ESG factors can reduce the cost of debt, but the effects vary across studies. Moreover, the impact of sustainability factors on the cost of equity is less clear and the results may depend on the metrics and research methods used. Debt investors seem to value social capital and environmental awareness, which can lead to lower debt costs and better loan terms. On the other hand, some studies have found that credit ratings are more important than CSR ratings for debt investors. In summary, the role of sustainability factors in the cost of capital for companies is complex and varies across contexts and metrics.

4 Data and Methodology

This chapter introduces the data used in the thesis and its characteristics and discusses the methodology of the thesis. Furthermore, the regression models to be used and the variables of the regressions are presented.

4.1 Data

The sample for the study consists of Nordic companies, excluding financial companies, which have an ESG rating available and sufficient financial data for variables from the selected database. The final sample covers the period 2017-2023 and 2009 firm observations to provide more topical insight on the topic. In this thesis, the Nordic market consists of four different stock markets, which are Stockholm, Helsinki, Oslo, and Copenhagen. The data is collected from two different databases which are Refinitiv Eikon Asset4 and Thomson Reuters Worldscope. ESG data is taken from the Refinitiv Eikon Asset4 database and financial data variables are taken from Thomson Reuters Worldscope database.

4.1.1 ESG Ratings

The Refinitiv Eikon Asset4 database is used for the ESG ratings of Nordic companies and the data for the thesis was retrieved in April 2024. The ESG data used in this thesis focuses on the years 2017-2023 to ensure the analysis captures the most recent trends and developments within Nordic companies.

Refinitiv Eikon Asset4 ESG data is collected from a wide range of publicly available sources, including annual reports, company websites, stock exchange releases, NGO websites, CSR reports and news sources. Around 700 content researchers around the world collect and process this data, covering more than 630 ESG metrics. ESG scores are calculated in an objective and transparent way, measuring a company's ESG performance, commitment and efficiency based on 10 main themes, taking into account differences

across industries and company size. Data is continuously updated to reflect companies' reporting schedules and any changes. (Thomson Reuters 2024).

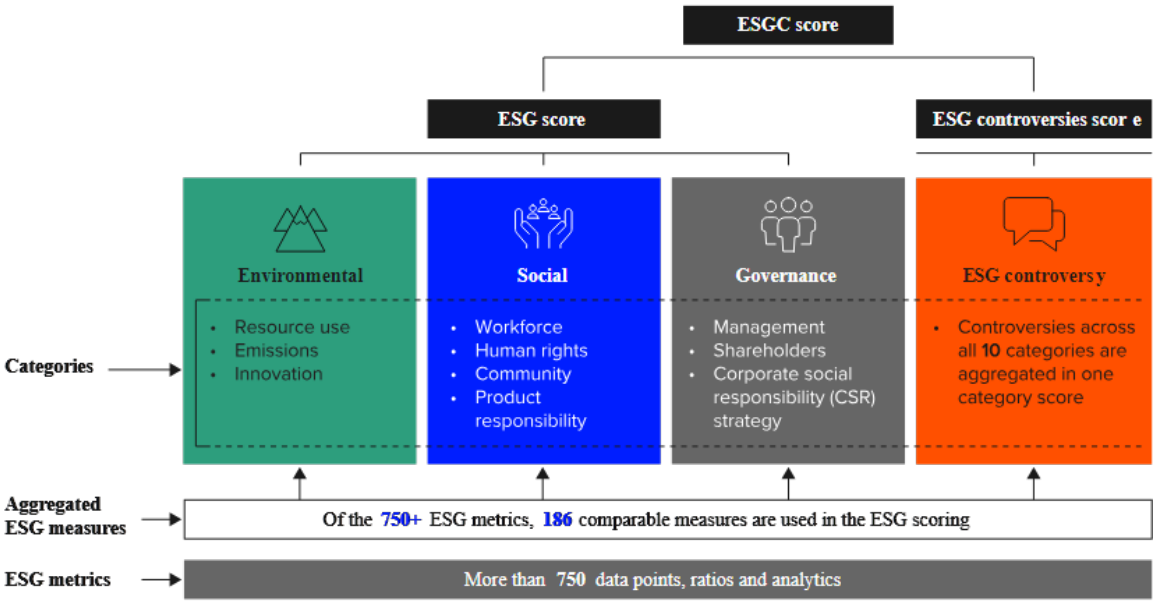

Figure 3.. Thomson Reuters ESG Score framework.

The ESG data collection process is fully transparent and automated. The ESG score is divided into 10 different categories and points are awarded for each category. The categories are divided under the individual pillars of ESG, namely environmental, social and governance. The final score is the sum of the different pillars and categories. The figure below illustrates how the ESG score is structured and which of the 10 different categories are included and how the categories are distributed under the different pillars. (Thomson Reuters, 2024)

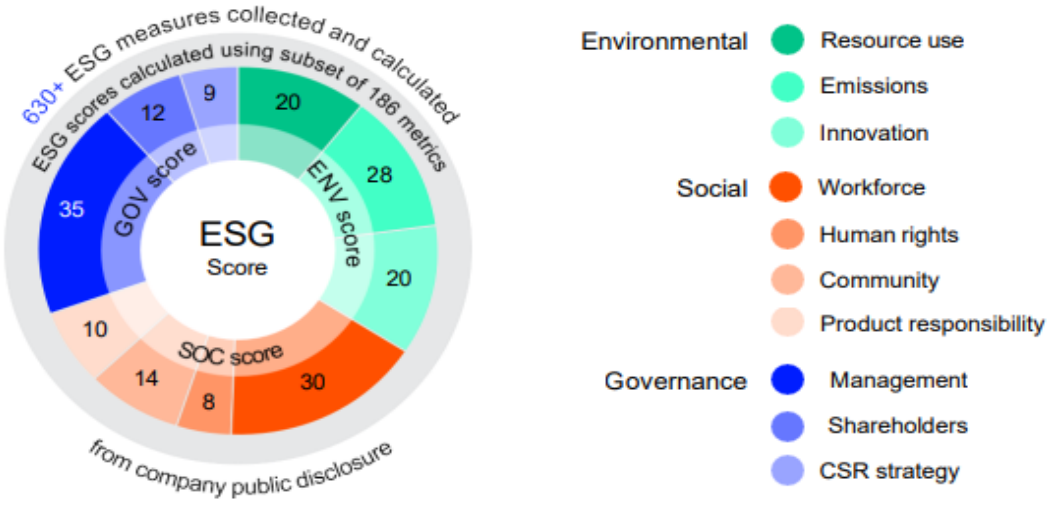

Figure 4.. Structure of ESG scores.

The ESG scores in the Refinitiv Eikon Asset4 database are broken down into four different quartiles. The quartiles are formed with companies in the first quartile (scores 0-25) showing poor ESG performance and insufficient transparency in ESG disclosure. Companies in the second quartile (>25-50 points) show satisfactory ESG performance and moderate transparency in ESG disclosure. Companies in the third quartile (>50-75 points) show good ESG performance and above average transparency in ESG disclosure. Companies in the fourth quartile (>75-100 points) show excellent ESG performance and high transparency in ESG disclosure. (Thomson Reuters, 2024).

4.1.2 Financial Data and control variables

The financial data in this study is taken from the Worldscope database of Refinitiv Eikon. The original raw financial data obtained included financial data for all Nordic (including dead assets) companies for the period 2017-2023. The Worldscope database contains data on company financial statements, ratios and market data and is widely used in academic research. As the Nordic countries have different currencies, the market data in this thesis is presented in euros to make the data comparable.

The control variables in this study are based on previous literature (Eliwa et al., 2019). The years 2017-2023 are used to construct the necessary ratios for the control variables. The control variables used in the regression analyses of the study are as following:

CoD = Ratio of company's interest expense to the average debt
Size = Natural Logarithm of total assets
LEV = Total debt of a firm divided by total assets
ROA = Net income before extraordinary items divided by total assets
Interest Coverage = Total operating income divided by interest expense

These control variables have been found to affect the cost of debt and are therefore included in the regression model of the thesis (Francis et. al, 2005).

4.1.3 Data construction

The original dataset obtained contained the ESG rating and financial data for each Nordic company for the period 2017-2023. For the empirical part of the thesis, this period has been selected as ESG ratings have become significantly more common in recent years. The study also focused on a shorter, more recent period to maintain comparability between the data. Each company for which both an ESG rating and the necessary financial data could be found has been selected for the sample of the empirical part of the thesis. Furthermore, companies from the financial services industry were excluded. The final dataset included 2009 annual business observations. The next section describes in more detail the data used in the thesis and its content.

4.2 Descriptive Statistics

Figure 5 illustrates the average ESG scores for Helsinki, Stockholm, Oslo and Copenhagen showing the evolution of ESG scores between 2017-2023. Helsinki consistently shows

the highest ESG scores among marketplaces, starting at around 70 in 2017 and reaching the highest level in 2023 at value above 70. Stockholm maintains a steady performance, with an ESG score ranging between 50 and 60 throughout the period under review. Oslo shows a gradual increase, starting from around 48 points in 2017 and rising to 55 points in 2023. Copenhagen also shows a steadily rising ESG score, rising from around 55 in 2017 to almost 60 in 2023. The trend shows an overall improvement in ESG scores for all cities, with Helsinki leading and Copenhagen making significant increases over the years.

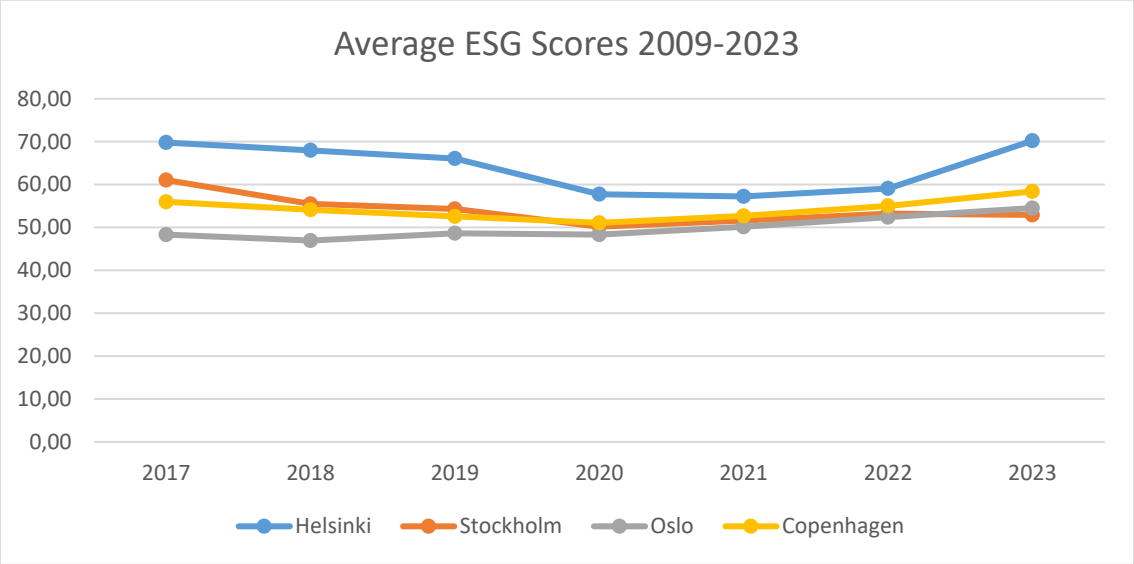

Figure 5. Average ESG ratings between 2017-2023.

Table 2 shows the number of annual ESG ratings in the Nordic market for the period 2017-2023. The data gives indication of the number of ESG ratings per year for each country. The total number of ESG ratings is 5013. The year 2020 recorded the highest number of ratings with 1025 ratings, reflecting an increased focus on ESG issues, possibly due to increased awareness and regulatory pressure. The preliminary number for 2023 is 64 ratings, which may indicate ongoing data collection or reporting delays. The increase in the number of ratings suggests that ESG factors will become increasingly important in the Nordic market over the years.

Year	Count of ESG Ratings
2017	454
2018	649
2019	769
2020	1025
2021	1046
2022	1006
2023	64*
Total	5013

Table 4. Count of ESG ratings in Nordic Markets per year between 2017-2023. **Ongoing data collection.*

The data reflects a positive trend in both the quality (average score) and quantity (number of ratings) of ESG ratings in the Nordic market between 2017 and 2023, with Helsinki consistently achieving the highest scores, indicating strong ESG performance, while other cities show significant improvements, particularly in recent years. The significant increase in the number of ESG scores highlights the growing importance of sustainable and responsible investment practices in the region.

Table 3 shows the correlation matrix of the variables in the study. The correlation matrix gives an overview of the relationships between the different variables. This table includes several economic and ESG measures, and below is an analysis of the correlations between these variables.

	CoD	*Size*	*ROA*	*Leverage*	*IntCov*	*Debt-To-Capital*	*ESG score*	*Env*	*Soc*	*Gov*
CoD	1									
Size	-0,069	1								
ROA	-0,092	0,213	1							
Leverage	-0,063	0,080	-0,204	1						
IntCov	0,001	0,057	0,128	-0,008	1					
Debt-To-Capital	-0,041	0,036	-0,225	0,713	-0,077	1				
ESG score	-0,034	0,541	0,137	-0,006	0,039	-0,003	1			
Env	-0,045	0,503	0,149	0,006	0,031	-0,004	0,858	1		
Soc	-0,017	0,503	0,140	-0,012	0,077	-0,003	0,900	0,743	1	
Gov	-0,020	0,356	0,047	0,022	-0,012	0,018	0,729	0,438	0,455	1

Table 5. Correlation matrix.

Table 4 below shows the means (Mean), standard deviations (S.D.), quartiles (0.25, 0.75) and medians (Mdn) of the different variables. This gives an overview of the distribution and variation of the data. The data shows a wide variation, especially in financial variables such as EBIT and total assets, suggesting that firms differ significantly in size and financial performance. For ESG variables, the averages are moderate, but significant standard deviations and wide interquartile ranges suggest that companies vary widely in their ESG performance. The size of companies is relatively stable, but there is also some variation. Each continuous variable is winorized at the 1% and 99% level to avoid biasing the numbers. The results appear to be reasonable, as they are broadly in line with previous literature (Eliwa et. al., 2021).

Variable	Mean	S.D.	0.25	Mdn	0.75
CoD	0,15	2,12	0,02	0,03	0,05
Size	15,37	1,96	14,01	15,46	16,76
ROA	4,08	18,38	1,53	5,54	9,55
Leverage	0,27	0,21	0,14	0,25	0,36
IntCov	19,19	42,71	1,72	9,26	22,20
Debt-To-Capital	0,39	0,47	0,22	0,36	0,49
ESG Score	50,84	19,88	36,09	52,12	65,87
Env	44,56	24,91	23,74	42,52	64,96
Soc	53,85	22,93	37,57	55,88	72,13
Gov	51,73	23,02	32,35	51,36	71,20
EBIT ($ mils)	2 464	18 491	28	303	1 259
Total assets ($ mils)	24 878	76 175	1 221	5 191	19 027

Table 6. Descriptive statistics.

Panel A below shows the distribution of the different marketplaces for the Nordic companies in the sample in the thesis. There are 266 firms in Copenhagen, representing around 13.2% of the total. Helsinki has 279 firms, representing around 13.9% of the total. In Oslo there are 393 firms, representing around 19.6% of the total. Stockholm has 1071

firms, representing around 53.3% of the total. A total of 2009 enterprises are spread over the four main marketplaces. Stockholm is by clearly the largest marketplace, covering more than half of all firms, while Copenhagen is the smallest of the four marketplaces.

Moving on to Panel B, which presents the distribution of sampled firms by industry. By industry, manufacturing is by far the largest industry, covering 33.00% of all firms, corresponding to 663 firms. The consumer discretionary industry is the second largest, with 375 enterprises, representing 18.67% of the total. The Health Care industry has 257 firms, representing 12.79% of the total. The Technology industry covers 201 firms, representing 10.00% of the total. The basic materials industry covers 152 firms, representing 7.57% of the total. The energy industry covers 143 firms, representing 7.12% of the total. The consumer staples industry contains 110 firms, representing 5.48% of the total. The telecommunications industry accounts for 76 firms, representing 3.78% of the total.

The smaller industries are Utilities and Real Estate, with 27 and 5 firms respectively, representing 1.34% and 0.25% of the total. In total, 2009 firms are divided into ten different industries, showing considerable diversity. This diversity reflects the broad economic diversity of the Nordic market, although some industries, particularly manufacturing, are significantly larger than others.

Panel A: Marketplace distribution.

Market Place	Count of Market Place
Copenhagen	266
Helsinki	279
Oslo	393
Stockholm	1071
Total	2009

Panel B: Industry distribution.

Industry	Count of Industry	%- of Industry
Basic Materials	152	7,57 %
Consumer Discretionary	375	18,67 %
Consumer Staples	110	5,48 %
Energy	143	7,12 %

Health Care	257	12,79 %
Industrials	663	33,00 %
Real Estate	5	0,25 %
Technology	201	10,00 %
Telecommunications	76	3,78 %
Utilities	27	1,34 %
Total	2009	100,00 %

Table 7. Total number of firms per marketplace and industry.

4.3 Planned regressions

The methodology of the study closely follows the research of Eliwa, Aboud and Saleh (2019). There is also one additional regression model that is not directly based on previous literature. In this additional model, the Cost of Debt variable is replaced by the firm's Debt-to-capital ratio and the purpose is to try to obtain some evidence on the impact of ESG on the firm's debt ratio.

The regression model is the standard errors pooled model which has also been used in previous literature (Eliwa et. al., 2019). Standard error pooled regression refers to the Newey-West error correction method designed to deal with heteroskedasticity and serial autocorrelations in regression analysis. This method is particularly well suitable for the panel data used in this paper. In panel data, the correlation and variation of errors change over time and therefore the standard OLS regression model is not the most reliable option. With the Newey-West method, it is possible to obtain more reliable standard deviations, which improves the reliability of statistical tests. Moreover, Newey-West is particularly suitable for panel data where multiple time series and cross-sectional data are combined into a single analysis, as it takes into account the possible dependencies of error terms between different time periods and variables. (Newey & West, 1987).

The first regression aims to examine how a company's ESG rating affects the cost of its debt. The regression analysis also includes financial control variables. The formula of the regression model is the following:

$$\mathrm{CoD}_{i,t} = \alpha + \beta_1 \mathrm{ESG}_{i,t} + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{LEV}_{i,t} + \beta_4 \mathrm{ROA}_{i,t} + \beta_5 \mathrm{IntCov}_{i,t} + \beta_6 \mathrm{IndustryFixed}_{i,t} + \beta_7 \mathrm{YearFixed}_{i,t} \quad (2)$$

Where the dependent variable is the *Cost of Debt* which is calculated as the firm's interest costs divided by the average debt. The independent variable is the *ESG* rating of the company. The regression model also includes several control variables that have been found to have an impact on the cost of debt (Francis, LaFond, Olsson & Schipper, 2005). The control variables in the model are *Size* which is calculated as the natural logarithm of total assets of the firm, *Lev* is total debt of the firm divided by total assets, *ROA* is net income before extraordinary items divided by total assets and *IntCov* is total return on assets of the business delated by total interest expense. In addition, the model includes industry and year fixed effects that take into account possible industry and time period differences.

The second of the main models seeks to explore in more detail the impact of the individual pillars of ESG on the cost of debt. In this model, ESG is replaced by its individual pillars Environmental, Social and Governance. The formula for the second main model is the following:

$$\mathrm{CoD}_{i,t} = \alpha + \beta_1 \mathrm{Env}_{i,t} + \beta_2 \mathrm{Soc}_{i,t} + \beta_3 \mathrm{Gov}_{i,t} + \beta_4 \mathrm{SIZE}_{i,t} + \beta_5 \mathrm{LEV}_{i,t} + \beta_6 \mathrm{ROA}_{i,t} + \beta_7 \mathrm{IntCov}_{i,t} + \beta_8 \mathrm{IndustryFixed}_{i,t} + \beta_9 \mathrm{YearFixed}_{i,t} \quad (3)$$

In the second main model, there are no other changes in the variables except the replacement of ESG by its individual pillars.

The additional regression model used in this thesis is based on a previous model that used the cost of debt (CoD) as the dependent variable. In this new model, instead of the cost of debt, the Debt-to-Capital ratio of the firm is used as the dependent variable. This change allows the model to measure how different factors, such as a firm's ESG score, environmental, social and governance practices, firm size, profitability, and interest coverage, affect the firm's capital structure policy and debt-to-capital ratio.

Unlike the previous model, this one does not rely directly on the literature, but focuses on examining the firm's debt and capital structure choices. This model aims to provide some evidence on how ESG factors and other economic indicators affect a firm's debt ratio, which may provide indications on issues such as a firm's risk-taking, the optimization of its financial structure, or the impact of environmental and social responsibility on its financing strategies. The formula for the additional model is the following:

$$\begin{aligned}\mathrm{DebtRatio}_{i,t} = \alpha + \beta_1 \mathrm{ESG}_{i,t} + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{ROA}_{i,t} + \beta_4 \mathrm{IntCov}_{i,t} + \\ \beta_7 \mathrm{IndustryFixed}_{i,t} + \beta_8 \mathrm{YearFixed}_{i,t}\end{aligned} \quad (4)$$

In addition to the main tests in the thesis, robustness tests are also carried out using regression models. The robustness tests are based on previous literature (Eliwa et. al., 2019) and the first robustness test uses the IV model with EBIT as an instrumental variable. In the second robustness test, observations from Swedish firms are excluded as they represent about half of the total population.

5 Empirical Results

This chapter presents the empirical results of the thesis in a comprehensive format. The chapter draws on key findings on prior literature and discusses possible similarities and discrepancies. Firstly, the results of the first regression on the impact of the ESG score on the cost of debt are discussed. This is followed by a discussion of the impact of the individual pillars of the ESG on the cost of debt. Following this, the impact of ESG rating on the amount of debt-to-capital ratio is examined and the findings of this regression model are discussed. Finally, after discussing the results of the main regression models, the results of the robustness tests are presented and discussed.

5.1 Impact of the ESG performance score on Cost of Debt results

Firstly, the primary regression model of thesis is discussed, which aims to examine how the ESG score affects the cost of debt. Based on methodology from prior literature (Eliwa et al., 2019), this model was used to analyze how ESG rating effects on Cost of Debt with specific control variables. Moreover, the same regression was also used with individual pillars of ESG to acquire more detailed information on how these affect the cost of debt.

Table 7 presents the results of the first and second regression models. Regarding the ESG variable, the results indicate that the ESG score (0.001) does not have a significant impact on the cost of debt. Previous literature has yielded mixed results, with some studies suggesting that ESG does not have a statistically significant impact on the cost of debt, while others argue that ESG can reduce debt costs. For instance, Eliwa et al. (2019) found a significant correlation between higher ESG scores and lower debt costs. Additionally, prior literature indicates that CSR has a significant impact on the cost of debt. Goss & Roberts (2011) found that higher CSR scores lead to lower costs of debt. However, Erragragui (2018), who used Corporate Social Performance (CSP) instead of ESG in his study of the US market, did not find a relationship with a downward impact on the cost of debt.

The second regression model focuses on examining the effects of individual pillars of the ESG on the cost of debt. The results indicate that in this study the effects of the environmental pillar were not significant, as the coefficient of the *ENV* variable -0.005 was not statistically significant. This conflicts with the study by Eliwa et al. (2019) finding strong statistical evidence suggesting that a good Environmental (ENV) score can have a reducing effect on the cost of debt. Similarly, Crifo, Diaye, and Oueghlissi (2017) found in their study on how ESG ratings affect government bonds that the environmental pillar reduces the cost of debt. For the social pillar, the results show a positive coefficient (-0.007, significant at the 5% level) and this suggest that firms with a higher *Soc* score would have a lower cost of debt. This result is in line with previous studies (Eliwa et al., 2019; Crifo et al., 2017). Finally, the Governance pillar, which has no significant impact on the cost of debt in this study (coefficient -0.001).

In both regression models, the effects of the control variables on cost of debt are similar and mostly statistically significant, confirming part of the findings from previous literature. Firm size is negatively correlated with the cost of debt as expected. In model 1, the coefficient on size is -0.060 (significant at the 5% level), and in model 2 the coefficient is - 0.063 (significant at the 5% level), which indicates the larger firms have a lower cost of debt. Leverage is negatively correlated with the cost of debt. In both models, the coefficient is significant, and its values are -0.138 and -0.135 (Significant at the 1% level). This result is not fully consistent with previous literature, previous literature has found Leverage to be positively correlated with CoD (Eliwa et. al., 2019), however Erragragui (2018) found a statistically significant negative correlation between Leverage and Cost of Debt. ROA has a negative correlation on the cost of debt, in both models, the coefficient of ROA is -0.11 (significant at the 1% level), which suggests that higher profitability of the firm reduce the cost of debt. Lastly, the interest coverage, which is not a statistically significant variable in either model. The coefficients are nonsignificant, 0.00004 in model 1 and 0.0003 in model 2, indicating that the effect of interest coverage on the cost of debt is not so significant in this dataset. This is not entirely in line with previous studies, as

previous studies have provided evidence of the significance of interest coverage in relation to the cost of debt. (Eliwa et al., 2019; Erragragui, 2018; Goss & Roberts, 2011).

	(1) CoD	*(2) CoD*
ESG	0.001	
	(0.003)	
Env		-0.005
		(0.003)
Soc		-0.007**
		(0.003)
Gov		-0.001
		(0.002)
Size	-0.060**	-0.063**
	(0.030)	(0.030)
Leverage	-0.139***	-0.135***
	(0.130)	(0.030)
ROA	-0.11***	-0.011***
	(0.003)	(0.003)
IntCov	0.00004	0.0003
	(0.0001)	(0.0001)
Constant	1.286***	1.240**
	(0.489)	(0.490)
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Observations	2009	2009
R-squares	0.026	0.028
Adjusted R-squared	0.016	0.017
****p<0.1, **p<0.05, ***p<0.01.***		

Table 8. Regression results for ESG and individual pillars and their impact on cost of debt.

5.2 Impact of the ESG performance score on Debt to Capital ratio

The purpose of the model is to provide evidence on how ESG rating affects the capital structure of the firm i.e., whether companies are able to limit their debt with an ESG rating. This regression model has been modified from the regression model of Eliwa et. al, (2019) which has also been used in the primary regression models in this thesis, by using the Debt-To-Capital ratio of the company as the independent variable. In addition,

leverage has been excluded from the control variables to avoid statistical bias in the results. There is very limited previous academic research on the relationship between ESG rating and capital structure. Asimakopoulos, Asimakopoulos & Li (2023) have studied the impact of ESG on the capital structure of a company. They examined whether firms can optimally leverage their debt through ESG rating and how ESG affects the sources of debt. They found evidence that companies with an ESG rating tend to reduce both target market and book leverage. Especially companies with a better ESG rating have a stronger deleveraging effect.

Table 8 below shows the results of the third regression model, which are broadly in line with previous literature. Regarding the ESG variable, the coefficient -0.006 (significant at 10% level), indicates that the ESG score has a negative impact on Debt-To-Capital ratio. This suggests that higher ESG scores are associated with lower debt ratios. (Asimakopolous et. al., 2023)

The results for the control variables are also broadly in line with the previous literature, although due to methodological differences not all variables are the same in the regression model (Asimakopolous et. al., 2023). The coefficient on firm size is 0.022 (significant at the 1% level), suggesting that larger firms tend to have higher debt ratios. In contrast, the ROA coefficient is -0.006 (significant at the 1% level) and the interest coverage coefficient is -0.00003 (significant at the 1% level). These results suggest that firms that are profitable and have a higher interest coverage ratio are less likely to use debt. (Asimakopolous et. al., 2023)

	(3) Debt Ratio
ESG	-0.006*
	(0.002)
Size	0.023***
	(0.006)
ROA	-0.006***
	(0.001)
IntCov	-0.00003***
	(0.00001)
Constant	-0.045
	(0.105)
Industry Dummies	Yes
Year Dummies	Yes
Observations	2009
R-squares	0.078
Adjusted R-squared	0.069
p<0.1, **p<0.05, ***p<0.01.	

Table 9. Regression result for the ESG impact on Debt-To-Capital%.

5.3 Robustness tests

The robustness tests follow previous literature, (Eliwa et al., 2019) and the robustness tests use instrumental variable model with EBIT as the instrument and in the second robustness test, the sample of Swedish observations is excluded as the Swedish market observations cover about half of the entire thesis data.

In the first robustness test (Table 9), we examine the endogeneity of the data and the bias of missing variables. For this test, we have chosen EBIT (earnings before interest and taxes) as the instrumental variable to ensure the reliability of the regression analysis results. The ESG coefficient is not statistically significant (0.007), which is in line with the

main regression (Table 7), where the ESG coefficient was also not significant (0.001). The size coefficient is not statistically significant (-0.093), which differs from the main regression where it was significant (-0.060, significant at the 5% level). The ROA coefficient is statistically highly significant (-0.011, significant at the 1% level), as in the main regression (-0.11, significant at the 1% level) and the Leverage coefficient is significant (-0.125, significant at the 5% level), which is in line with the main regression (-0.139 significant at the 1% level). Furthermore, the Interest Coverage coefficient is not statistically significant, which is in line with the main regression.

The adjusted R-squared for the debt ratio in the IV model is negative, i.e. statistically insignificant. For DebtRatio, this robustness test does not provide robustness to the results and this model in this respect is not suitable to verify the DebtRatio results. This may be because the robustness test is designed to validate the results of the primary regressions, and therefore a better robustness test should be built for DebtRatio.

	IV (CoD)	**IV (DebtRatio)**
ESG	0.007	-0.010
	(0.102)	(0.022)
Size	-0.093	0.076
	(0.560)	(0.121)
ROA	-0.011***	-0.006***
	(0.003)	(0.001)
Leverage	-0.125**	
	(0.338)	
IntCov	0.00004	-0.0003**
	(0.0001)	(0.00001)
Constant	1.426	-0.247
	(2.475)	(0.616)
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Observations	2009	2009

R-squared	0.024	-0.041
Adj. R-Squared	0.014	-0.048
****p<0.1, **p<0.05, ***p<0.01.***		

Table 10. Robustness test with IV-model using EBIT as an instrument.

The second robustness test also follows the methodology of Eliwa et al., (2019) by excluding the largest country from the sample, which in this case is Sweden. The purpose is to check whether the results change by excluding the country with the highest number of observations from the sample. The results of the second robustness test are presented in table 10 below.

Regarding the cost of debt, the ESG coefficient is not statistically significant (-0.0003), which is in line with the main regression. The ROA coefficient is statistically highly significant (-0.001, significant at the 1% level), as in the main regression and Leverage is statistically significant at the 5% level (-0.094), which is in line with the main regression. However, the Size coefficient is not statistically significant (-0.003), which differs from the main regression where it was significant.

For Debt Ratio, all variables are in line with the results of the main regression. The ESG coefficient is statistically significant (-0.002, significant at the 10% level), which is in line with the main regression, but the effect is smaller. The size coefficient is statistically significant (0.017, significant at the 10% level), which is in line with the main regression, but the effect is smaller. The ROA coefficient is statistically highly significant (-0.010. significant at the 1% level), as in the main regression. The Interest Coverage coefficient is statistically significant (-0.0003, significant at the 1% level), in line with the main regression.

Overall, the robustness tests support the main regression results in most cases in main regressions. ROA and Leverage are consistently significant variables in all tests, while Size appear to be sensitive to specific conditions such as instrumentation and country differences. The robustness tests show that the main regression results are generally reliable,

but it should be noted that certain variables may vary depending on the method of analysis and the sample

	CoD **(1)**	**DebtRatio** **(3)**
ESG	-0.0003	-0.002*
	(0.0003)	(0.001)
Size	-0.003	0.017*
	(0.003)	(0.010)
ROA	-0.001***	-0.010***
	(0.0003)	(0.001)
Leverage	-0.094***	
	(0.020)	
IntCov	0.00000	-0.0003***
	(0.00001)	(0.00003)
Constant	0.161***	0.398**
	(0.047)	(0.162)
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Observations	938	938
R-squared	0.045	0.219
Adj. R-Squared	0.025	0.208
****p<0.1, **p<0.05, ***p<0.01.***		

Table 11. Robustness test. Regression result when Sweden is excluded.

6 Conclusions

This chapter summarizes the thesis and draws conclusions. First, the results of the thesis are discussed and how they are consistent with previous literature. Any new findings are also discussed. The limitations and implications of the thesis are then discussed. Finally, a proposal for future research is presented.

The primary objective of the thesis was to examine the impact of ESG on the cost of corporate debt. The study used ESG and financial data of Nordic companies for the period 2017-2023, with a total sample of 2009 observations. Previous literature has presented results both for and against the impact of ESG, but there has been limited research on the Nordic countries. This thesis aims to fill this research gap. The results show some evidence of a link between ESG and debt costs, but the results are not entirely conclusive. Another objective of the thesis was to provide preliminary evidence on the impact of ESG ratings on a firm's debt ratio. The results suggest that the ESG rating would have an impact on the debt ratio of a company.

Previous studies have shown evidence that ESG or CSR factors can reduce a firm's cost of debt (Eliwa et al., 2019; Hoepner et al., 2016; Nandy & Lodh, 2012). In addition to these studies, there are also studies that have found no evidence that ESG can reduce a firm's cost of debt (Erragragui, 2018; Chava, 2014; Menz, 2010). The primary research question of this thesis was to answer the question of whether a better ESG rating reduces a firm's cost of debt. Based on the empirical results, this thesis found no statistically significant evidence that a high ESG rating is associated with lower debt costs. Thus, the first hypothesis of the thesis must be rejected.

The subsequent hypotheses of the study focused on examining the relationship between the individual pillars of ESG—Environmental, Social, and Governance—and the cost of debt. For the individual pillars, it was identified that the social pillar (Soc) is statistically significant and thus companies with a better social rating would receive a cheaper debt. This finding is in line with prior literature (Eliwa et. al., 2019). A negative correlation was

also found between the Environmental and Governance pillars and the cost of debt, but the results were not statistically significant and therefore the actual effect of the relationship is uncertain.

Besides the relationship between ESG and the cost of debt, the objective of this thesis was to provide preliminary evidence on the impact of ESG on the debt ratio of a company. For this research question, the same regression model was used, but the firm's Debt-To-Capital ratio was changed as explanatory variable. The empirical analysis showed that there is a statistically significant negative relationship between the debt ratio of an enterprise and its ESG rating. This would imply that firms with a higher ESG rating would use less debt financing. This finding supports the study by Asimakopoulos et al. (2023), who found that higher ESG scores are associated with lower debt-to-equity ratios. However, it should be noted that this model was only intended to provide preliminary evidence and does not yet allow us to draw any major conclusions.

Overall, this thesis showed no new results on the relationship between ESG and the cost of debt. The results were in line with previous literature, and no major surprises emerged in the results. However, fewer statistically significant results were found compared to earlier studies. This may be due to the impact of the COVID-19 pandemic, which covers a significant part of the sample window and had a significant impact on the real economy and corporate debt levels over the sample period. Although the results were not all statistically significant, the robustness tests in the thesis were nevertheless in line with the main analyses, which confirms the reliability and relevance of the results. This consistency adds confidence that the findings of the study are robust and generalizable across different analyses and testing conditions.

However, it should be noted that the results of this thesis clearly show that research findings on this topic can vary significantly across markets and time periods. The Nordic countries are known for their high ESG standards (Singhania et. al., 2024), and this may

make it more difficult to detect significant differences between companies and thus affect the detection of statistical significance.

6.1 Limitations

There are several limitations in this thesis that need to be considered when analyzing and generalizing the results. One important limitation is the variability of ESG data between different data sources. Different ESG data providers use different estimation methods, which may affect the reliability and comparability of ESG data. As a result, ESG data from different sources may give conflicting results, making it difficult to draw consistent conclusions. This limitation is particularly important when comparing related studies using different ESG data sources.

The second limitation relates to the control variables used in the regression model. Different studies use different formulas and definitions of control variables, which may affect the comparability of results. The calculation formulae in this thesis were based on the study by Eliwa, Aboud and Saleh (2019), but other similar studies may use completely different control variables or different definitions for the same variables. The variables in the regression models may also be the reason why the adjusted r-squared remains quite low in some model results, which means that the models and their variables do not fully explain the variation in the dependent variable. This may affect the comparability of the results of this study with other related studies.

Furthermore, a fundamental limitation concerns the model used to explain the relationship between the debt ratio and ESG. Although the model used in this thesis provides some useful information, it is not necessarily the best model for studying the topic. Future studies would benefit from exploring this topic with different models that could provide more accurate and comprehensive insights into the relationship between ESG and the debt ratio. This could help to deepen our understanding of how ESG factors affect firms' financing structures and debt management strategies.

6.2 Future research suggestions

Based on previous findings and limitations, future research would benefit from developing and testing different models that could better explain the relationship between ESG ratings and the debt ratio of a company. As the model used in the current study may not be optimal for examining this link, future studies could make use of alternative statistical models or methods.

It would also be interesting to extend the research across sectors and countries, especially considering the impact of different regulatory environments on the relationship between ESG ratings and corporate debt ratios. This could provide a more comprehensive understanding of how ESG factors affect companies in different contexts. Future studies could also look more closely at the individual effects of ESG pillars on different aspects of the debt relationship to see whether specific ESG factors play a greater role in debt management strategies and firm financing solutions. This could open new perspectives and provide valuable insights for both academic research and practical business decision making.

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