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ESG IMPACT ON FIRM PROFITABILITY, VALUATION AND COST OF DEBT

Nordic evidence

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ABSTRACT

Burning of fossil fuels, using child labor or failing of internal control procedures are just a few examples of corporate responsibility matters that have become essential in today's business world. Increasing amount of time and research have attempted to demonstrate the importance of corporate responsibility and how it drives financial value. The aim of this thesis is to examine this uncertainty. More explicitly, the research focuses on how corporate responsibility influence firm's profitability, valuation and cost of debt. Environmental, social and governance (ESG) ratings have become typical indication of firm's non-financial health and is utilized among professional investors. How effectively ESG scores are assessed by debt and equity markets is yet obscure and motivation of this thesis.

ESG impact is tested by using pooled OLS regressions for 200 publicly listed firms in Nordic countries. Data is obtained from Thomson Reuters' database and covers period from 2002 to 2016. Regression models test the overall impact of ESG as well as takes deeper focus in the best and worst ESG performers by using dummy variables.

Empirical findings of this research indicate that ESG impact is significant and positive in firm's market valuation. The results suggest that equity markets reward those firms with very high ESG performance and ignore those with very low ESG performance. Unlike previous literature and findings suggest, cost of debt is not lower for those with higher responsibility performance. Lastly, profitability seems to be positively associated with ESG rating as far as return on asset is used. Whereas ROE seems to be negatively associated with better ESG performance. These findings contribute to the previous literature by testing ESG impact only for Nordic countries and finds significant link between ESG ratings and firm's market valuation.

KEYWORDS: ESG, corporate responsibility, responsible investing, sustainability

1. INTRODUCTION

"We have come to a point now where this agenda of sustainability and corporate responsibility is not only central to business strategy but will increasingly become a critical driver of business growth … how well and how quickly businesses respond to this agenda will determine which companies succeed and which will fail in the next few decades"

As stated by Patrick Cescau, a group chief executive of Unilever, the importance of corporate responsibility has become essential part in business world and how well firms respond to the phenomenon will determine their future. Although numerous researches have attempted to study how and in what extent corporate responsibility drives financial value, no universal agreement is settled. Despite this, quantity and quality of nonfinancial disclosure practices are enhanced all over the world (Schreiber, R. 2013. Hayward, Lee, Keeble, McNamara, Hall, Cruse, … & Robinson 2013). The importance of implementing *environment*, *social* and *governance* (ESG) risk factors in business analysis has become more like a norm and has required firms to weigh benefits and costs of reallocating resources. The major argument against the importance of ESG underlies in the uncertainty. How corporate responsibility drives financial value and whether ESG performance truly has positive effect in future returns is yet rather obscure. (Crane, Matten & Spence 2014).

The lack of pure evidence supports those who are against corporate responsibility. Instead of "wasting" time on responsibility matters, they often are supporting Milton Friedman's (1970) widely-known profit maximization theory. Under this theory, firm's main responsibility is to maximize profits with minimal ethical contribution. This must be done without violating the law and regulation. The statement is shared by wide range of economists, leading business men and politicians. This sets guideline for many. However, the recent movement towards responsibility has gained remarkable popularity and several theories are formed to support responsible business activity. Many trustworthy economists have encouraged firms to focus more on positive impact on society. One of many, Marc Epstein, states that long-term economic growth is no longer possible unless the growth is achieved socially and

environmentally sustainable way. Finding the balance between economic performance, social responsibility and environmental protection can lead to competitive advantage, which itself is enormous incentive for executives to recognize the matter. (Epstein 2008: 19-24).

If competitive action itself does not motivate enough, growing number of government regulation and industry codes of conduct require better responsibility actions than ever before. In that sense, ignorance of corporate responsibility may result in surprisingly costly procedures unless the regulation is followed with care. Legal costs, fines or weakened reputation may follow the ignorance. On the other hand, if firm implements successful responsibility strategies, it may generate long-term value, achieve competitive advantage and build stronger relationship with its stakeholders. While the potential of corporate responsibility is easily presented, it does not come for free. Neither is corporate responsibility activities gratuitous they do not guarantee financial value. Therefore, careful responsibility analysis is required and estimations of how the strategy drives financial value is more than important (Epstein 2008, Magnanelli & Izzo 2017).

Corporate responsibility, as discussed earlier, has shaped the modern concept of financial theories and today more emphasis is set on non-financials and each stakeholder. Under the recent theories, stakeholders are either directly or indirectly affected by the business. The concept follows the *Triple Bottom Line* approach introduced by Elkington (1997). In contrast to Epstein, Elkington similarly promotes for higher focus on sustainable development and proper actions on environmental, social and economic dimensions. According to him, main objective is still in creating financial value, but it needs to be created with sustainable means.

A fourth dimension to Elkington's Triple Bottom Line has recently emerged in the financial literature, namely governance. Combination of the three - *environmental*, *social* and *governance (ESG*) - has become important indicator of firm's non-financial performance. The indicator is assessed by numerous rating agencies by gathering publicly available information. Thomson Reuters, one of the rating agencies, is providing ratings on over 4600 publicly listed companies worldwide. The ratings are standardized and easily comparable to each other, which can be utilized in investment decisions. (Achim & Borlea 2015).

When non-financial information is implemented into investment decision, it is essential to estimate how the information contribute to firm's financial performance and riskiness. The estimation includes some level of uncertainty, which is not important only for professional investors, but should firm's most important concern and guide firm in its actions. Non-financial uncertainty has become more important than before and shapes the future of a firm. In fact, some of the large institutional investors have begun to demand for better nonfinancial reporting in order to analyze firm's risks. If corporate responsibility information is not properly published or managed, investors might reduce their position and invest somewhere else. Therefore, ignorance or negative actions with regarding non-financial matters are essential and affect firm's operation. To respond to the growing demand, majority of firms have developed some sort of responsibility strategies. Some of these take broader matters into consideration such as climate change, board diversity and CEO payouts. What this means is that firm may have to reallocate scarce resources and implement responsibility strategies. Sometimes it may be a necessity to keep the current shareholders on board not to mention of attaining new ones (Virginia 2016, Magnanelli & Izzo 2017).

The movement in corporate responsibility has spread all over the world; however, the fastest movement has occurred in Nordic countries. According to Midttun, Gautesen and Gjølberg (2006) Nordic companies generally perform better with regarding corporate responsibility. Public expectations for transparency, workplace equity and sustainability are highly appreciated and significantly higher than elsewhere in the world. Investment entities enforce firms to perform responsibly and they use ESG information actively in their investment decisions (Amel-Zadeh & Serafei 2017). The importance of corporate responsibility is more valued among Nordic corporations and is exploited in several ways in building sustainable business. For instance, business image, long-term plans and competitiveness are built by taking responsible dimension into account (Vidaver-cohen 2009 & Brønn 2015). While companies and clients are more aware of the non-financial importance, the relevant regulatory authorities have also enforced more regulation on ESG. Therefore, no companies or investors can ignore the increasing ESG movement and are obliged to take steps in responding to the phenomenon. (Midttun et al. 2006 & Vidaver-cohen 2009).

There is no discussion whether ESG will become even more important in future, but it is rather unclear how ESG scores are associated with company's future value. While professional investors have begun to demand for better non-financial practices and simultaneously firms have begun to implement various responsibility strategies, shouldn't these two provide some financial value benefit to firm then? Motivated by this, this thesis examines the impact of the ESG information and studies whether ESG ratings, assessed by Thomson Reuters, explain a something of this uncertainty. In other words, this thesis investigates if better ESG performance is rewarded with higher financial value and whether non-financial performance is as important driver as the recent literature suggests. In this thesis, I will focus on how ESG ratings are associated with firm's profitability, market valuation and cost of debt. If ESG performance is as important factor as discussed, the financial characteristics mentioned should become more desired in case of high ESG rating.

1.1. Purpose and objectives of thesis

Over the recent few decades the implication of corporate responsibility has been the topic of countable researches, articles and debates. However, the results are contradictory. Therefore, many corporations are still skeptical whether resources should be reallocated on ESG matters and in what extent. Due to lacking compatible evidence of ESG's direct impact on financial value, there is clearly space to investigate this topic.

Purpose of this thesis is to examine whether ESG performance is associated with financial value. Motivated by the better ESG incorporation in Northern Europe, the thesis is focused on ESG impact on Nordic countries. General guideline of this research is ESG performance and its impact on financial characteristics. More specifically, the aim of this study is to quantitatively analyze if ESG performance can be linked with financial benefits in Nordic countries.

The motivation behind this research is associated with the modern theories of corporate social responsibility (CSR) and its positive effects on firm's long-term performance. CSR theories

suggest that if firm has great relationship with its stakeholders and transparently discloses its operation, positive consequence should follow. Consequently, it becomes easier to evaluate firm's future risks and business itself. In contrast, if firm discloses poorly its operations and have poor relationship with its stakeholders, there is more uncertainty and higher underlying risk involved. Thus, engaging in better non-financial practices should theoretically be associated with lower risk and higher financial value. This in turn, should lead to lower cost of debt and higher profitability as well as valuation. If this is true, firms clearly benefit from better responsibility performance and should therefore be exploited by firms. This study attempts to resolve this obscure connection. (Crane et al. 2014).

1.2. Research questions

In this study, as mentioned earlier, I will focus on few firm specific financial characteristics – profitability, market valuation and cost of debt - and how they are driven by ESG ratings. Large number of researched same connections; however, none of these seem to focus solely on Nordic countries.

The first research question of this thesis is important in management's perspective and concentrates how non-financial performance drives firm's overall profitability. Based on prior findings, companies that perform better on ESG matters have higher overall profitability. Motivation behind this question underlies in the uncertainty of whether firms benefit from high ESG performance and are associated with higher profitability. More explicitly,

RQ1: How does ESG ratings contribute to firm overall profitability?

The second research question concentrates more on how ESG rating is valued in equity markets. According to the recent survey by Amel-Zadeh & Serafeim (2017) professional investors expect positive screening and active ownership to become more important in the future. This raises an interesting question. If positive screening will become more important

strategy, is it already priced in stock prices in Nordic countries? If positive ESG screening is used by majority of investors, firms with higher ESG ratings should theoretically have higher market valuation. The second research question is driven by this idea and more explicitly concentrates on the following,

RQ 2: How firm's market valuation is driven by ESG rating?

The third and last research question concentrates on possible cost of debt benefits. As mentioned earlier, corporate responsibility theories suggest that better stakeholder management and transparent operation should result in lower risk level and lower cost of debt. My third research question examines this connection. Based on the previous findings, companies with better ESG performance have lower idiosyncratic volatility and consequently have lower cost of debt (Mishra & Modi 2013). The last research question tries to examine the relationship between ESG rating and cost of debt. The last research question examines the following:

RQ 3: How does ESG rating affect cost of debt?

All the research questions have slightly different angle, but in the big picture, all try to uncover the association between ESG performance and financial value among publicly listed Nordic firms.

1.3. Structure of the thesis

The thesis proceeds as follows: Second chapter of this thesis concentrates on theoretical background. It covers some of the most relevant and important theories with regarding corporate social responsibility and foundation of the whole environmental, social and governance ratings. Third chapter reviews previous literature and summarizes the most relevant findings amidst ESG matters. Fourth chapter demonstrates what kind of data is used and comprehensively goes through the regression models. Fifth chapter presents empirical

results and discusses findings in detail. Sixth chapter summarizes major findings, concludes the research and suggests further investigation ideas.

2. THEORY AND ESG FUNDAMENTALS

Purpose of this chapter is to present the development of corporate responsibility and latest theories that seem to dominate the area. Environmental, social and governance (ESG) rating has become a typical combination to indicate firm's non-financial performance that stems from the concept of corporate social responsibility. Thus, it is essential to begin by presenting ideas behind corporate social responsibility and how it has built the foundation for today's ESG concepts. First three sub-sections of this chapter focus on corporate social responsibility, which is followed by discussion about the emergence of ESG and responsible investing.

2.1. Definition of corporate social responsibility (CSR)

Burning of fossil fuels within energy sector, local air pollution in Beijing, child labor in Asia, human rights abuses in Africa or corruption in South America are just a few examples of possible responsibility issues that executives need to deal with in today's business world. These and many other possible issues, are typical in many countries and combined threaten the sustainability of the whole world. In response, people from many sectors have set new objectives to change the course of unsustainability. The ultimate target would be to make society more sustainable, which would be further developed and create human well-being without harming life supporting systems (Halweil, Mastny, Assadourian & Starke 2004).

CSR development has become extremely important part of creating shareholder value and active implementation of sustainable strategies are more common. Those firms that attempt to implement sustainability into their actions, attempt to meet the financial objectives of the present without crossing ecological boundaries or violating the needs of future generations (Robert, K-H., Oldmark, J., Broman, G., Basile, G., Waldron, D., Haraldsson, H., Ny, H., MacDonald, J., Byggeth, S., Moore, B., Cook, D., Connell, T., Johansson, L. & Missimer,

M. (2012). The issue whether firms need to consider corporate responsibility and the impact of their activities on each stakeholder is no longer the question of 'whether' but rather 'how'. It is often an uneasy mission because financial targets and incentives are typically driven by both short- and long-term results. This in turn, generates a situation in which managers are required to simultaneously improve corporate social and financial performance, which do not always go hand in hand (Epstein 2008:19)

To get around this paradox, companies have long been developing various sustainability strategies, but the implementation of the strategies has usually been the greater difficulty. Business units in factories or sales forces are reward if certain number of products or certain sale targets are reached. The performance of the two, and many more, are typically measures that direct employees work. Putting numbers and incentives to reward employees on better ESG performance is rather complicated. Most often the social or environmental performance is not measured at all. In other words, firms are often missing proper alignment of the strategy, structure, systems, performance measures and rewards to facilitate effective implementations. This creates a challenge on how to effectively implement sustainability strategies into core business.

CEOs are often involved and central part in driving successful implementation strategies. However, the challenge of how to balance between the three elements - social, environmental and financial– requires demanding evaluations. These three elements together form sustainable performance of firm, which is one form of CSR. Sustainability itself has unlimited numbers of definitions but I prefer to follow Epstein's (2008) introduced definition:

> "Sustainability has been defined as economic development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. For businesses, this includes issues of corporate social responsibility and citizenship along with improved

> management of corporate social and environmental impacts and improved stakeholder engagement".

Leading corporations have recognized the importance of sustainability and have implemented strategies to control social, environmental and economic performance. Such strategies may be driven by internal factors such as management commitment to sustainability or the recognition of the potential that sustainability may provide if implemented effectively. However, the strategies are often driven by external pressures that consists of government regulation, customer demands, competitors' actions or non-governmental organizations. Either internal or external pressure, the importance of stakeholder engagement can no longer be left out. Employees' desire to work, customers' desire to buy products and community's desire to let company operate are just a few aspects that certainly affect firm performance. Therefore, the potential impact on long-term profitability and stakeholder relationship must be effectively managed.

No firm with high probability will ever achieve fully integrated sustainability processes, but many firms have taken major steps toward reducing the negative social and environmental impacts and improving sustainability performance. Successful integration requires the recognition of all the impacts that are caused by corporate activities and to understand how these impacts settle on all the stakeholders (Epstein, M.J 2008: 20).

2.2. Evolution of corporate social responsibility

Long before the modern perception of corporate responsibility today, the concept has the roots far back in 1960s and has continuously evolved since then. Prior to 1960s, issues related to corporate responsibility were not widely discussed in public and the prevailing view was to encourage growth and industrialization. The view was believed to enhance citizens' well-being and no attention was paid to possible negative effects. In 1960s, the general view was about to be influenced. The social and environmental movements started to encourage people

to demand for a better corporate behavior and sustainability in the United States. Corporations were now expected to have good morals, ethical behavior and give something back for communities (Robert, K-H. et al. 2012:15-29).

Numerous campaigns were launched, aiming to influence corporations to treat employees more fairly, enhance community engagement and use better environmental practices. This, in turn, forced firms to invest more time and money in attempting to fill the demands of customers and give something back for communities.

For many corporations, the demands were powerful enough and the CSR became a standard policy for many. However, the movement did not satisfy all. Some of the most significant economists and business leaders disgraced the whole idea of CSR. Milton Friedman, one of the most notable American economists, belonged to the resistant group. He stated that companies' only responsibility is to maximize profits and it will essentially help local communities in terms of more jobs. The balance between Friedman's statement and CSR has arguably included numerous debates among respected economists in the late 20th century.

As years moved, consumers had not given up for the development of CSR despite the opposing views of many. Better CSR policies and practices were demanded and by the end of 1980s, major influence on corporate behavior had been achieved. Global campaigns were made against South Africa's apartheid policies and consumers began to boycott those firms that had business with South Africa. Soon corporations had to respond to consumers' power and were engaged in better accountability and corporate behavior. By the end of 1990s, CSR was linked as one of the central parts of corporate culture. The ways firms had to communicate with stakeholders and deal with ESG issues was unprecedented. (Crane et al. 2014:20-21).

2.3. Modern theories of corporate social responsibility

Crane, Matten and Spence (2014) conclude that the current CSR theories lay on the following four types of theories: instrumental, political, integrative and ethical theories. They state that the most relevant CSR ideas can be located to the following categories, which helps to narrow down the so-diverse corporate social responsibility subject. This section will briefly discuss each of the four categories and what are common ideas in each of them.

2.3.1. Instrumental theories

Under instrumental theories, firms' primary target is to focus on economic aspect and operate as an instrument to create wealth. In that perspective, any social activity that is not in line with wealth creation should not be accepted. These theories perceive CSR as any other factor that may affect future earnings.

One of the approaches is widely known as maximizing the shareholder value. Implications to shareholder value is the dominant criterion for corporate decision-making. Any actions in social demands that increase the shareholder value should be implemented within boundaries of the law. The only focus on the shareholder value maximization has recently lost value and more popular approach is to take people with a stake in the firm into consideration. "Enlightened value maximization" was proposed by Jensen (2000) and this theory specifies firm's objectives as long-term value maximization in which decisions are considered as tradeoffs among the stakeholders.

Strategies in achieving competitive advantage are also related to instrumental theories in a sense because they create economic value. But in contrast, under these theories, the focus is on how to simultaneously achieve long-term social objectives and create competitive advantage. The bottom line here is that firm can create a competitive advantage by investing in philanthropic activities

Cause-related marketing refers to the process in which firm enhances its performance or customer relationship by building better business image. Particularly, this image is built with some ethical or social responsibility matter. In other words, some customer concerns for responsibility are used to achieve competitive advantage. (Crane et al. 2014:76-80).

2.3.2. Political theories

Political theories focus on the interaction between business and society and on the power and position of firm on society. This includes political considerations and analysis in the light of CSR. Two major approaches can be separated from political theories – corporate constitutionalism and corporate citizenship. Under these two, business must use its power responsibly. This power consists of wide range of areas including political power. Under the constitutionalism, the power is not only internal but also external, which should be managed with care. If the social power is not adequately used, firm will lose its social position and power within society. Corporate citizenship has similar emphasis on business responsibility and the view focuses on rights, responsibilities and possible partnerships of business in local society. However, the local focus has slowly been extended towards global focus, meaning that firms have local responsibility and global business responsibility. (Crane et al. 2014:80-84).

2.3.3. Integrative theories

Theories under this category emphasizes the importance of social dimension and states that firms depend on society for their existence, continuity and growth. Focus is on how firms integrate social demands in their business and how they follow social values within society. The aim is to detect and response to the social demands to gain social legitimacy, social acceptance and prestige. The concept of responsiveness to social issues is known as *Issues Management*, which attempts to minimize uncertainty that may arise due to some social or political changes. Important is to respond systematically and effectively to any specific

incident that may impact business significantly. Slightly opposing view, namely *public responsibility* was formed to guide and limit firm's corporate responsibility. Under this view, the importance of the public process is emphasized to limit the range of responsibilities. The scope of responsibilities is found within the framework of relevant public policy, which also includes social direction. Following the public policy forms the essence of this principle.

To define the scope of responsibilities with even more specific target, the concept of *stakeholder management* was created. The approach concentrates on stakeholders who are directly or indirectly affected by corporate actions. The main goal of this view is based on the following two principles. Firstly, it is important to maximize the overall cooperation between all the stakeholder groups and business objectives. Secondly, efficient stakeholder management involves efforts to integrate stakeholders into managerial decision-making. To measure firm's responsibility actions, *corporate social performance (CSP)* was formed in 1970s. Its aim was to give a better picture of firm's corporate performance with respective to its entire range of obligations to society, which includes the economic, legal and ethical dimensions of corporate performance. The approach has taken various forms since the emergence of it, however the three core dimensions are still central to it. (Crane et al. 2014:84-88).

2.3.4. Ethical theories

Last group of modern CSR theories concentrates on the ethical obligations that firm has on society. Under these theories, it is typical to consider what is the right thing to do or even necessity to have positive impact on society. *Normative stakeholder theory* is an approach that considers the ethical perspective and under this view a responsible firm incorporates all the appropriate stakeholders into its decision-making. Unlike barely focusing on maximizing the benefit of stockholders, this approach balances the interest of multiple stakeholders by not putting one stakeholder in favorable position. The stakeholder approach has faced a mass of critique because the view itself is not sufficient. To respond how corporations should be governed and how managers should act, supporters of normative stakeholder theory have

attempted to create normative core of ethical principles (Freeman and Evan 1988, Bowie 1991, Freeman and Phillips 2002).

Another important approach that has become widely popular is known as *sustainable development.* It was first developed at macro level; however, it is also applied among wide range of corporations today. World Commission on Environment and Development published a report known as "Brundtland Report" in 1987 and since then sustainable development has been widespread phenomena. The report defined sustainable development as a method to meet the needs today without harming the future generation to meet their needs. This aim of the report has since evolved and social dimension has been linked to it. This has formed the triple bottom line, which includes economic, social and environmental aspects of corporation. Lastly, *the common good approach* emphasizes that businesses, individuals or any other social groups, being part of the society, should contribute to the common good. Each contributor should affect positively on society instead of engaging in harmful practices. (Crane et al. 2014:88-91).

2.4. The emergence of ESG

The term ESG has become widely used and known risk factor for many institutional investors and investment professionals in 21st century. The impact of ESG does not emerge only from *environmental, social and governance* practices but the metrics has been used to count for all the non-financial fundamentals that may influence company's financial performance. The potential impact on investment return and risk has driven the emergence of ESG and has motivated investors to incorporate ESG considerations into investment decision. In fact, over half of all the publicly traded equities globally are now signed by the United Nation's Principles for responsible investment (UNPRI). Underlying premise is that institutional investors have economic incentives and ESG incorporation derive both, lower risk and higher returns. (Ho, V., H. 2016).

From the corporation's standpoint, future risk and return are the main indicators of economic performance and financial health. Much of risk management's focus is on reducing firm-specific or idiosyncratic risk. Lower firm-specific risk means lower volatility of performance relative to the market. Idiosyncratic risk includes both, financial and non-financial risks. Thus, idiosyncratic volatility is affected by firm's ESG risk, but to what extent, it is rather debatable. Although firm-specific risk covers both ends, negative and positive, firms tend to keep the idiosyncratic volatility low to avoid unfavorable long-term value. However, some level of firm-specific risk, either financial or non-financial, needs to be taken for growth and higher expected returns. Therefore, possible ESG impact becomes essential because it may positively affect firm's financial performance. (Mishra et al. 2013).

Environmental events, reputational harm or poor corporate governance are few examples of non-financial firm-specific risks that are valued among responsible investors and affect the decision-making process. These ESG measures are leading and forward-looking over different time horizons. Conceptually, the measures of ESG risk should be a result of firm's responsible business practices. Therefore, irresponsible practices should lead to higher ESG risk exposure and adversely responsible practices should lead to lower ESG risk exposure. (Crane et al. 2014).

The importance of ESG is seen by the grown amount of ESG data providers. There are number of third party agencies that evaluate firms' ESG performance. These ratings are used by institutional investors, asset managers and other stakeholders in comparing firms' non-financial performance. Although there are growing number of ESG data providers, there is no standardized ESG methodology. Thus, what source and how ESG data is used vary among providers. Some of the most well-known providers include Bloomberg ESG Data Service, MSCI ESG Research, Thomson Reuters ESG Research Data and KLD Research & Analytics (Escrig-Olmedo E., Munoz-Torrez, E. & Fernandez-Izquirerdo M. 2010).

2.5. Responsible investing

Responsible investing is an investing style or approach in which environmental, social and governance (ESG) matters are incorporated in investment decisions to manage risk and achieve sustainable long-term returns. The most prominent approach relies in the *Principles for Responsibility Investment* (PRI) developed by an international group of institutional investors and supported by the United Nations. The main objectives of PRI are to better understand the influences of investments on ESG matters and to support signatories to incorporate the ESG factors on investment and ownership decisions. The spread of PRI has been remarkable and consists a wide range of signatories from all over the world who all follow the six principles for responsible investment.

The six principles of PRI were developed in aiming to respond to the growing relevance of ESG issues to investment practices. Implementing the six principles are voluntary and aspirational, but at the same time they set expectations for investment partners. In signing the principles, does not solely mandate to follow them, but it is rather a public commitment to adopt and implement them. More importantly, the principles offer an informative platform of possible actions for how to incorporate ESG issues into investment decision. The six important principles consist of the following guidelines:

Principle 1: We will incorporate ESG issues into investment analysis and decision-making processes.
Principle 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.
Principle 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.
Principle 4: We will promote acceptance and implementation of the principles within the investment industry.
Principle 5: We will work together to enhance our effectiveness in implementing the principles

Principle 6: We will each report on our activities and progress towards implementing the principles.

The underlying premise of following the principles is that investors achieve the broader objectives of society and act in the best long-term interest of the beneficiaries. The number of signatories for responsible investment has constantly grown since the April 2006. The interest in responsible investment is driven by the recognition that ESG issues matter. The following figure demonstrates the recent growth of PRI signatories,

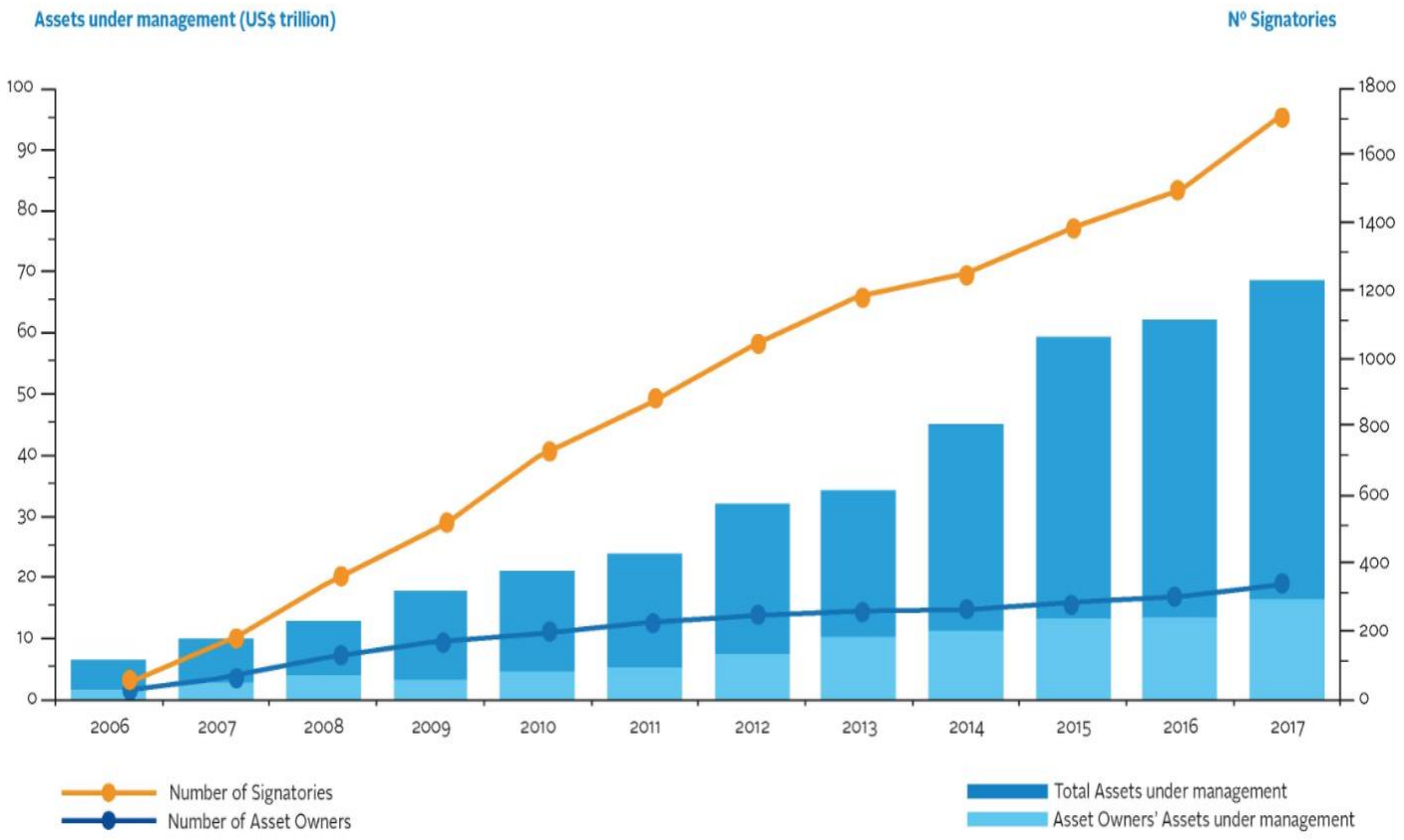

Figure 1. Principles for Responsible Investment. Source: UNPRI (2018).

2.6. Sin stocks

Not all the investors engage in responsible investing and might find so called Sin stocks appealing. Other names such as “vice stocks”, “shunned stocks” and “unethical stocks” are also used for the same stocks. The nature of these stocks is strongly against PRI’s principles and CSR theories. Sin stocks differ from other stocks in their business model and the industry in which they operate. More explicitly, these firms make money from human vice such as alcohol, tobacco, gambling or weapons. For many investors, being associated with sin stocks is against their investing philosophy. To ensure these stocks are not selected into their portfolios, exclusion lists are often composed. (Blitz, D., & Fabozzi, F. J. 2017).

Despite the growing exclusion policies, numerous studies show that sin stocks have historically generated significant abnormal returns. The outcome is typically explained by the systematic underpricing of sin stocks. When large number of investors exclude sin stocks from their portfolios, those who invest against social norms are compensated with a reputation risk premium. Another plausible explanation would be that sin stocks operate in monopolistic environment and thus earn monopolistic returns. These firms also face large litigation risk and bearing this risk is rewarded. (Blitz et al. 2017).

Theoretically sin stocks have the opposite characteristics to high ESG performing stocks that strive for positive environment, social and governance impact. Under this research, sin stocks would be the worst ESG performers and should have low profitability and firm valuation. Investing in sin stocks is not prohibited by any methods and there are investment vehicles that solely focus on sin stocks. USA Mutuals Vice Investor Class Shares (VICEX) is a great example of a mutual fund that specifically targets in sin stocks and mainly invests in companies that derive their revenues from vice industries. In the figure 2, it is clearly seen that at times VICEX generates significantly higher returns than S&P 500 index.

History (11/30/2017)	2012	2013	2014	2015	2016	YTD
VICEX	21.16	32.19	0.78	2.58	9.40	21.39
S&P 500 TR USD	16.00	32.39	13.69	1.38	11.96	20.49
Category (LB)	14.96	31.50	10.96	-1.07	10.37	19.03

Figure 2. VICEX performance. Source: Morningstar (2018).

Blitz & Fabozzi (2017) studies the historical performance of sin stocks and confirm that sin stocks earn significant CAPM alpha in the U.S., Europe and global area. However, after the sample is controlled with Fama and French (2015) factors, significant alpha disappears. Thus, according to the study, sin stocks do not earn any kind of "sin premium" but rather follow current asset pricing models and their factor exposures.

3. PRIOR EMPIRICAL EVIDENCE

Previous literature on ESG matters have continuously and remarkably increased since the mid 20th century. Even so, findings are rather contradictory and universal agreement of ESG impact is not found. It seems that results fluctuate depending on what kind of methods are used as well as region and time period. Although evidence fluctuates, majority of studies conclude that the importance of ESG will become more dominant and gain more popularity worldwide. Thus, ESG performance should be taken seriously and implemented in firm's business at least in some extent.

This chapter provides the latest and some older essential findings with regarding ESG impact on firm's financial characteristics. The chapter is divided into four sub-sections, which focus on a specified ESG relation. First sub-section presents how ESG is used by professional investors affecting stock prices in equity markets. Next sub-section reviews how firm's profitability and valuation relates to ESG performance in the recent studies. Third sub-section presents findings with regarding ESG and cost of capital. The last sub-section summarizes the major findings of each section.

3.1. ESG in financial markets

How ESG related information is implemented and used among investment professionals is rather versatile and the culture of firm has a lot to do with it. Amel-Zadeh and Serafeim (2017) survey this topic and investigate how global senior investment professional use ESG information in their investment decisions. In the research, professional investors were selected from the mainstream in order to avoid any possible biases. If SRI fund managers formed the primary sample, the results would be biased toward responsible investing without telling the whole truth. The research suggests that professional investors use ESG information primarily for performance purposes. ESG related information were believed to

be associated with better investment performance. Higher returns were not considered as the main benefits, but ESG ratings were considered to provide more information with regarding underlying future risks. According to the survey, negative ESG screening was more frequently used although it was considered as the least beneficial method ESG method. In contrast, investment professionals perceived positive screening and full integration of ESG in stock valuation more beneficial procedures and believed them to become more dominant methods in future.

This belief has become very common among investors and has motivated countless academic researchers to study the subject in different angles. One of many, Arx & Ziegler (2008) study how stock prices and corporate responsibility performance are linked with each other. The study is conducted for U.S. and European stock markets. They find that firms with better social and environmental practices earn higher monthly returns compared to firms within same industry. Finding suggests that ESG information is priced in equity markets. However, statistical significance drops after Fama & French three factor model is used instead of original capital asset pricing model. After all, the research implies that high environmental and social performances provide an opportunity to increase monthly returns. The relationship is not statistically very strong. What is essential to realize is that better responsibility does not result in worse financial performance, but provides only possibility to gain financial value.

Similar study was later conducted by Sahut & Pasquini-Descomps (2013). The research investigates the relationship between the ESG ratings and monthly market returns in Swiss, UK and U.S. stock markets. In contrast to Arx & Ziefgler (2008), this study does not support for better ESG performance. The results seem to be affected by the year and industry specific factors. However, what they find is that better ESG performance in UK is associated negatively with excessive monthly returns. According to the finding, higher ESG performance corresponds negatively with the excessive returns in UK. The evidence is against the claims of positive ESG influences on stock returns.

Lee, C., Palmon, D. and Yezegel, A. (2016) study ESG relation with slightly different angle. They examine how financial analysts and their stock recommendations are associated with corporate social responsibility performance. They find a negative relationship between the amount of ESG information and total number of revisions. This finding suggests that financial analysts do not implement ESG information as much in their analysis when the amount of ESG information increases. This would suggest that stock analysts are challenged to convert large amount of ESG information into their stock recommendations.

Lee, D. & Faff, R. (2009) also investigate how stock returns are affected by corporate responsibility performance. The comparison between the bottom and top CSR performers provide unfavorably evidence for those who support corporate responsibility. They document that the top and bottom responsibility portfolios have significant difference. More specifically, they find that portfolio with better economic, social and environmental risk management strategies underperform its counterpart. They also find that firms with better corporate social performance have significantly lower idiosyncratic volatility. This would suggest that firms with better ESG performance provide less volatile returns and contain less firm-specific risk that might already be priced in the markets. Mishra and Modi (2013) also find that positive responsibility performance is associated with lower idiosyncratic risk.

3.2. ESG impact on firm financial performance and valuation

Impact of corporate responsibility on firm financial performance and valuation has been studied with various interpretations. One of the earlier studies about the matter by Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985) does not provide any significant association. The relationship between social responsibility and profitability could not be linked. The conclusion of the research state that responsibility performance neither benefits nor harms firm’s profitability.

Kim K., Kim M. & Qian (2015) study the same relationship with slightly different method. They separate firms by their competitive actions and study how responsibility performance affects the financial performance of the two groups.

High competitive actions in this study refer to those firms that introduce new products frequently, invest substantially in marketing and expand operation capacity actively. The results suggest that firms with high competitive actions and positive responsible activities are rewarded by better financial performance. They find significant association with better responsibility and financial performance. In contrast, firms with low competitive actions and positive responsible activities harm the financial performance significantly. This latter group enhances financial performance by implementing in negative responsible activities. Thus, this group is better off by ignoring socially responsible activities in their strategy. The conclusion of this research is that ESG impact depends on the level of competitive actions taken by firm. ESG activities may even harm those that engage in low competitive actions.

Guenster, Bauer, Derwall & Koedjik (2010) concentrate only on environmental side of the responsibility performance. They investigate the relationship between environmental performance and operating profitability. They find significant and positive link between environmental performance and operating profitability. US based firms with strong environmental performance are linked with significantly higher profitability than their counterparts. In contrast, those firms with poor environmental practices are linked with significantly lower profitability. Similar results are documented for Egyptian market by Genedy & Sakr (2017). Instead of using only environmental aspect, the research takes social and economic aspect into consideration. The research suggests positive relationship between corporate social responsibility and financial performance. Those firms with better responsibility performance have significantly higher ROA, ROE and EPS ratios. Based on these studies, strong responsibility practices generate benefits that clearly outweigh the underlying costs.

In contrast, Ioannou & Serafeim (2016) find that when better ESG information is driven by regulation, the effects are more value enhancing. The results present that higher firm valuation, measure by tobin's q, is significantly higher for those who are regulated for better disclosure practices. The study shows that even in the absence of specific guidelines, firms today are generally more motivated to deliver higher quality ESG information, which is rewarded with higher market valuation. Thus, the economic effect seems to be positive and on average the effects of stronger regulation is favorable. According to this study, the efforts on increasing the sustainability regulations are effective and associated with enhanced disclosure practices as well as corporate value.

Gregory, A., Tharyan, R., & Whittaker, J. (2014) also find markets' positive valuation towards those firms with better corporate responsibility performance. The results of this study, suggest that higher market valuation is driven by higher long-term expected growth rate and responsibility performance. They also find that those firms with good responsibility practices are associated with lower cost of equity. This correlation; however, seems to be mainly driven by the industry effects.

Guenster et al. (2010) use eco-efficiency as a proxy for environmental dimension and study how it contributes to firm valuation, measured by Tobin's Q. The results prove that investors use environmental concerns in firm valuation. Thus, better environmental behavior contributes positively to market valuation of firm and create financial value. Moreover, they find that those companies with strong environmental performance are not initially traded at premium but will appear with a slight lag. Possible explanation for this would be the initial stock undervaluation that will later be corrected by the markets.

3.3. ESG Impact on cost of capital

Cost of capital, one of the main elements in financial management, has also been linked with responsibility measures on many academic papers. Theoretically better responsibility

performance should reflect in lower cost of capital. Important drivers behind this contain active stakeholder engagement and transparent non-financial reporting. Empirical evidence provides some support for the theories but also some against them. How responsibility performance impact on firm's access to finance is studied by Cheng, Ioannou and Serafeim (2017). More specifically, they are interested in studying how corporate social responsibility (CSR) performance influences firms' capital constraints. The research demonstrates significant financial benefits for those firms with better CSR management. They find that firms with better CSR performance are rewarded with easier access to finance. Especially, environmental and social dimensions seem to drive for easier access to finance.

Such as Cheng et al. (2017), Erragragui (2017) finds that virtuous environmental and governance behavior are significant factors affecting cost of capital in United States. The study shows that high environmental and governance performances are individually significant factors in reducing cost of debt. On the other hand, environmental concerns increase cost of debt, while governance concerns seem not to have impact on cost of debt. The results reveal that environmental aspect has explanatory power in both scenarios, while only high governance concern has impact on cost of debt.

Al-Hadi, Chatterjee, Yaftian, Taylor and Hasan's (2017) research agree with Erragragui although this study is concentrates on publicly listed firms in Australia. Similarly, the study results in significant and negative connection between high corporate responsibility performance and cost of capital. They find that those firms with more positive CSR activities have easier access to finance. What explains this is their finding of negative relationship between responsibility performance and financial distress. This suggests that those firms with more CSR activities are less vulnerable for financial distress and are therefore more reliable targets to be invested in. Moreover, corporate responsibility effect seems to be more significant for those firms that are at their early life cycle. This suggests that older firms are not as exposed to responsibility issues as newer firms.

Hsu and Chen (2015) agree on the same matter. Their research provides significant benefits to engage in CSR activities. More specifically, they find that those firms with higher CSR performance have significantly lower cost of capital. According to the study, those US-based firms with high responsible performance have higher credit ratings. These firms also tend to have lower credit risk than those companies with poor CSR performance. This finding suggests that socially responsible firms have significant borrowing cost benefits. Lower agency cost, better information transparency and lower bankruptcy risk are explained to be the reason for this phenomenon. All in all, those US-based firms seem to be rewarded with lower cost of debt that engage in favorable CSR activities. This eliminates the information asymmetry between internal and external stakeholders.

In contrast, Magnanelli and Izzo (2017) study the same matter with more global perspective. According to this study, corporate social performance does not have significant explanatory power in explaining cost of debt. Unlike Cheng et al. (2017) and Erragragui (2017), this study actually finds positive link between corporate social performance and cost of debt. This would mean that those firms with higher corporate responsibility performance are set to disadvantage and are associated with higher cost of debt. Nevertheless, the results of this study are not statistically significant.

While the evidence remains rather controversial, Orens Aerts & Cormier (2010) find that non-financial reporting has positive impact on cost of capital. The research investigates how voluntary non-financial disclosure and cost of capital are associated with each other. The findings have positive interpretations for corporate responsibility. According to the study, voluntary web-based non-financial reporting significantly reduces cost of equity in North-America and Continental Europe. They also find that cost of debt is lower for those firms that engage in web-based reporting. The latter result is significant only for those firms that are operating in Continental Europe.

3.4. Conclusions from prior findings

Despite the large amount of academic research, the riddle of ESG impact is more or less contradictory. Major findings show that professional investors use ESG information primarily for performance purposes and assessing risks. Negative screening is more frequently used, while full integration of ESG and positive screening were considered more beneficial. ESG information is perceived to contain more information on risks than competitive positioning of firm. Despite the growing popularity of ESG implementation, Sahut et al. (2013) find negative relationship between responsibility performance and excessive returns in UK. They also find that the relationship greatly varies with the time and industry. Lee D. et al. (2009) also document that better ESG performers underperform their counterpart in stock performance. Lee C. et al. (2016) find that stock analysts' recommendations and amount of ESG information is negatively associated, which suggests that information is yet rather challenging to interpret.

ESG impact on financial performance and firm valuation has also attained remarkable attention. One of the earlier studies conducted by Aupperle et al. (1985) does not provide significant evidence to either way. After all, the research concluded that responsibility performance neither benefitted nor harmed firm's profitability. On the other hand, Kim K. et al. (2015) find positive relationship for those firms that were categorized by their competitive actions. The research concludes that those firms with high competitive actions earn significantly higher profitability. Adversely, those firms with low competitive actions and high responsibility performance had significantly lower profitability. Therefore, the extent of ESG impact could be linked to firms with either low or high competitive actions. Finally, Guenster et al. (2010) & Genedy et al. (2017) find positive responsibility impact on various profitability ratios and firm valuation.

The responsibility impact on cost of capital is less investigated matter, nonetheless some significant evidence is found. Hsu et al. (2015), Cheng et al. (2017), Erragragui (2017) & Al-

Hadi et al. (2017) all find significant cost of capital benefits for those firms with higher responsibility performance. The results support that those firms with better CSR performance are rewarded with lower cost of debt and easier access to finance. This link is explained with the reduced information asymmetry, agency costs and bankruptcy risk.

4. DATA AND METHODOLOGY

The aim of this chapter is to present data and methodology used in this research. First sub-section presents overview of the sample, which is followed more comprehensive discussion of each regression variable. Next sub-section presents some data diagnostics to determine how regression models should be formed. Final regression models are presented next and last part presents the research hypothesis that guide the analysis.

4.1. Sample description

The primary interest of this research, as motivated earlier, is to examine the environmental, social and governance impact on firm profitability, market valuation and cost of debt. Thus, reliable environmental, social and governance ratings are essential on this research. ASSET4 unit of Thomson Reuters delivers ESG ratings for more than 8000 public companies worldwide which are used on this research. The database also contains other financial variables that are essential in the research such as size, sales growth, financial leverage and profitability. Therefore, all the variables used in this research are obtained from the same source. These variables are more comprehensively presented in the next sub-section.

The initial data set contains annual measures for publicly listed firms over the period of 2002 - 2016. Initially the data set contains 5313 publicly listed firms, yet majority of the firms are not assessed for their ESG performance. After those firms without ESG ratings are cleared out, the final data set contains 200 firms that have at least one year of ESG ratings available. After all, the data provides adequate number of observations for reliable research. Therefore, it is reasonable to use this source and exclude those firms without ESG ratings. Table 1 demonstrates the initial and final sample.

Table 1. Description of sample.

	Initial sample	**Final sample**
	Number of listed firms	Number of Firms with ESG rating
Nasdaq Copenhagen	818	38
Nasdaq Helsinki	618	37
Nasdaq Iceland	122	0
Nasdaq Stockholm AB	2980	84
Oslo Stock Exchange	897	41
Total	5435	200

As table 1 indicates, ratings are available for only small portion of total number of firms. Last column reveals that ESG observations are found from Nasdaq Copenhagen, Nasdaq Helsinki, Nasdaq Stockholm AB and Oslo stock exchange. Nasdaq Iceland does not contain any firms with ESG assessments and therefore it is excluded from the analysis. Thus, the final sample contains 200 publicly listed firms from four Scandinavian countries that have at least one ESG observation on 2002 - 2016 period. Next section presents what are the other essential variables used in this research.

4.2. Regression variables

As mentioned in the previous sub-section, ESG rating is the most essential explanatory variable in this research. But which variables are on the left side on regression models are equally important. Thus, dependent variables include important performance and borrowing cost measures such as firm profitability, valuation and cost of debt. Moreover, few variables are used to control for certain financial characteristics. Each variable and its formation is

presented in the next three sub-sections.

4.2.1. Dependent variables

Return on Assets (ROA)

As mentioned in previous section, firm profitability is one of the primary variables in this research. For firm's overall profitability, I use Return on Assets (ROA_{it}) ratio, which is consistently used in the prior literature (Guenster et al. 2010). I measure ROA_{it} by the ratio of operation income before depreciation divided by total assets at the beginning of the year. Based on the previous findings, I assume ROA_{it} to be positively associated with ESG ratings.

Return on Equity (ROE)

Return on equity is used as an alternative measure to count for firm's profitability. Return on Equity refers to the amount of net income as a percentage of shareholders' equity. I measure ROE_{it} by the ratio of net income divided by the total amount of equity at the beginning of the year. Similarly, I assume ROE_{it} to be positively associated with firm's ESG performance.

Tobin's Q

Following previous studies (Aggarwal, Erel, Stulz, & Williamson 2010, Mishra 2015, Gupta, Banerjee & Onur 2017), Tobin's Q is computed by the sum of total assets less the book value of equity plus the market value of equity divided by the total assets. I assume Tobin's Q to be positively associated with ESG ratings.

Market-to-book ratio

Market-to-book ratio is used as an alternative measure to count for firm's market valuation. It is calculated by dividing the market value of equity by the book value of equity. Respectively to Tobin's Q, I assume market-to-book ratio to be positively associated with ESG ratings.

Cost of debt (Kd)

Kd is used as a proxy for borrowing cost and is measured by the interest expense on debt divided by total debt. If ESG ratings turn out to have borrowing cost benefits, then cost of debt and ESG are negatively correlated. Based on the theoretical background, I assume negative relationship between the two.

4.2.2. Independent variable

Environmental, social and governance (ESG) – rating

To proxy for corporate responsibility performance, I compute ESG ratings based on the individual scores in environmental, social and governance dimensions attained from Thomson Reuters. Each score is standardized to facilitate comparable analysis and includes over 400 indicators that are obtained from publicly available sources. Therefore, the final ESG rating is based on publicly available material such as annual reports, CSR reports, company websites and global media sources. The ratings are aimed to indicate company's non-financial performance based on publicly available information about ten different ESG categories.

Environmental (E) score

Environmental score measures firm's impact on living and non-living natural systems, which includes the air, land and water, as well as complete ecosystems. The score shows how well a firm uses best management practices to avoid environmental risks and capitalize on environmental opportunities to generate long term shareholder value. Environmental score is based on three different categories that each consist of number of indicators. The categories are known as resource use, emissions and innovation. Each category is based on several indicators that evaluate firm environmental performance. Number of indicators per category determines its weight in the overall environmental score.

Social (S) score

Social score measures how well a company generates trust and loyalty with its workforce, customer and society, through its use of best management practices. The score reflects company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. The score includes four different categories namely workforce, human rights, community and product responsibility. Each category is based on several indicators that assess social performance. Number of indicators per category determines its weight in the overall social score.

Governance (G) score

Corporate governance score measures a firm's governance performance, which evaluates systems and processes that ensure board members and executives act in the best interests of its long-term shareholders. The score reflects a firm's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances to generate long-term shareholder value. The governance score is based on the scores of three categories known as management, shareholders and CSR strategy. Each category is based on several indicators that assess governance performance. Number of indicators per category determines its weight in the overall governance score.

A combination of environmental (E), social (S) and governance (G) scores form company's overall ESG rating in this research. Each dimension is weighted based on the number of indicators included within each dimension. Categories and number of indicators within categories are demonstrated below on the figure 3.

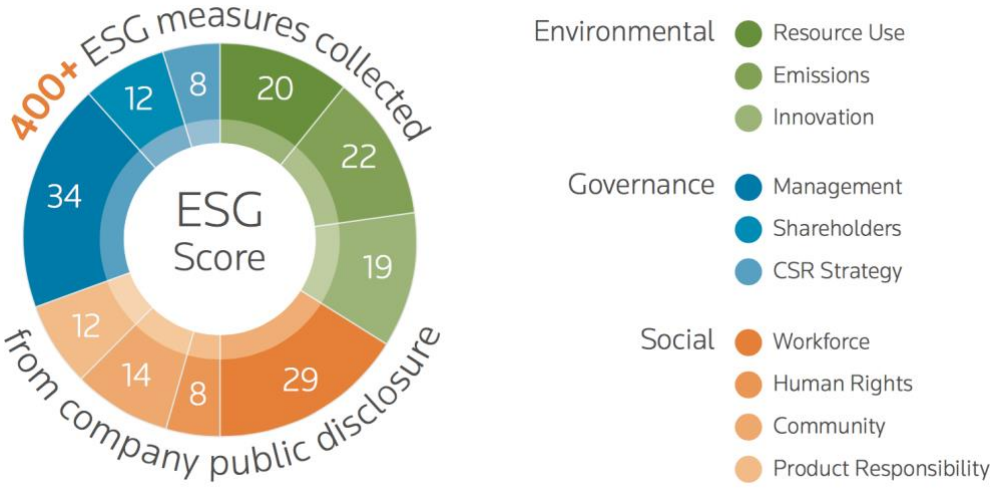

Figure 3. ESG metrics formation. Source: Thomson Reuters (2018).

4.2.3. Control variables

In this research, several control variables are needed. I follow Guenster et al. (2010), Aggarwal, Erel, Stulz, & Williamson (2010), Mishra (2015), Gupta, Banerjee & Onur（2017) methods as closely as possible. However, some variables had to be left out due data availability issues. Below are control variables obtained for the analysis.

Firm size

Firm size is measured by the natural logarithm of total assets.

Profitability

Firm's profitability is expressed as the *Return on assets* (ROA_{it}) ratio. Return on assets is measured by the operation income before depreciation divided by total assets at the beginning of the year.

Financial structure

Financial structure is measured by dividing total debt with total assets.

Sales growth

I use one-year sales growth, which is expressed as a percentage change of the last year.

Years in stock exchange

This variable tells how many years firm's stock has been available for trading.

Fixed Effects

Calculations are controlled for firm and year effects as well as country dummy is used for further analysis.

Table 2 summarizes regression variables and shows descriptive statistics of the full sample.

Table 2. Data description of the full sample.

	Mean	**Median**	**Maximum**	**Minimum**	**Standard Deviation**
ESG score	59,95	65,47	95,20	0,00	24,08
Environmental score	65,43	79,74	97,48	0,00	29,88
Social score	63,69	72,22	98,91	0,00	28,07
Governance score	49,71	52,38	96,35	0,00	25,53
ROA	13,34 %	12,17 %	74,70 %	-53,92 %	12,00 %
ROE	29,70%	17,91%	487,43%	-205,08%	61,33%
Tobin's q	1,76	1,46	40,19	-0,72	1,48
Market-to-book ratio	2,97	1,88	235,02	0,00	8,12
Cost of debt	5,53 %	4,50 %	98,91 %	0,16 %	5,43 %
Ln (total assets in thousand euros)	15,31	15,02	21,76	10,03	1,81
Financial structure (debt-to-assets)	0,27	0,25	0,89	0,00	0,17
Years in stock exchange	17	16	43	0	10
Sales growth (1Y)	6,72 %	4,12 %	344,99 %	-66,76 %	28,30 %

4.3. Data diagnostics

To build reliable OLS regression models, it is essential to take proper care of possible outliers and do some data testing to examine how models should be built. To avoid outliers that may results in misleading interpretations, 0,5% of both extreme values are cleared out. This solves the first concern. However, other procedures may be necessary to build valid regression models. In presence of cross-sectional dependency or heteroscedastic residuals, regression models may result in severely biased statistical inferences. If estimator residuals are dependent across the cross-sections, then Driscoll and Krayy's robust standard errors are efficient and enhance statistical significance. On the other hand, if estimator residuals are uncorrelated with each other, then Driscoll-Krayy's method does the opposite. (Hoechle 2007).

This sub-section tests whether cross-sections are exposed to dependency that determines whether fixed or random effects provide more suitable specification to the regression. If serial correlation is present, fixed effects become essential to implement and vice versa. The second part, tests whether heteroscedasticity must be considered and used in the regression models.

4.3.1. Random effect test

Cross-section dependency is tested first by using commonly known method, namely Hausman test. Underlying hypothesis is that the random effects model is consistent and effective. Rejection of the null hypothesis would suggest that error terms are correlated with each other. Table 3. presents the outcomes of the test. As it appears, fixed effects should be implemented in the regression models. Although the differences are low, p-value of the test (0,000) results in the rejection of null hypothesis. Therefore, fixed effects are utilized in this research.

Table 3. Hausman test with fixed and random effects models.

	Fixed	Random	Difference	Probability / Overall
ESG score	-0,000	0,000	0,000	0,710
Ln total assets (thousands)	-0,013	-0,005	0,000	0,002
Sales growth (1Y)	-0,004	-0,004	0,000	0,868
Debt-to-assets	-0,151	-0,109	0,000	0,000
ROA	-0,010	0,010	0,000	0,005
Years in stock exchange	-0,001	0,000	0,000	0,692
$X^2(6)$				44,06
$p > X^2$				0,000

4.3.2. Heteroskedasticity tests

The presence of possible heteroscedasticity is tested next by running Beausch-Pagan Lagrandian multiplier and White tests. The word heteroscedasticity refers to the inconsistency of estimation residuals which may cause troubles. It may occur either in the whole sample set or just in some subjects. The presence of heteroscedasticity may result in misleading or biased interpretations unless robust regression models are used.

Table 4. presents the results. As it appears, both tests result in low p-values (0,000) that support to reject the null hypothesis. In other words, data sample seems to have heteroskedastic residuals. Thus, robust standard errors of the coefficient variables provide statistically more reliable results and are applied following the methods of Driscoll and Krayy (1998).

Table 4. Beausch-Pagan and White tests.

Beausch-Pagan		
	F-statistics	9,35
	Obs* R-squared	169,71
	Prob. $X^2(20)$	0,000
White		
	F-statistics	7,08
	Obs* R-squared	173,74
	Prob. X^2 (27)	0,000

4.4. Regression models

To achieve the first objective of this research, regression models are built to test the ESG impact on profitability. This possible association is tested by pooled OLS regressions. I use *Return on Assets (ROA$_{it}$)* as dependent variable to proxy for firm's operating profitability and ESG rating to proxy for corporate responsibility performance. I compute weighted ESG ratings based on the individual scores in environmental, social and governance dimensions attained from Thomson Reuters. For control variables, I use size, financial leverage as well as firm and year specific effects. In addition, country dummy is used for further analysis.

Thus, the following regression models are formed to test the association between ESG scores and firm's profitability:

(1) $$Firm\ Profitability_{i,t} = \alpha_t + \beta 1_t\ (ESG_{it}) + \beta 2_t(Size_{it}) + \beta 3_t(Financial\ Structure_{it}) + Fixed\ Effects + \varepsilon_{it}$$

(2) $$Firm\ Profitability_{i,t} = \alpha_t + \beta 1_t(High\ ESG_{it}) + \beta 2_t(Low\ ESG_{it}) + \beta 3_t(Size_{it}) + \beta 4_t(Financial\ Structure_{it}) + Fixed\ Effects + \varepsilon_{it}$$

(3) $$Firm\ Profitability_{i,t} = \alpha_t + \beta 1_t\ (High\ E_{it}) + \beta 2_t\ (Low\ E_{it}) + \beta 3_t\ (High\ S_{it}) + \beta 4_t\ (Low\ S_{it}) + \beta 5_t (High\ G_{it}) + \beta 6_t (Low\ G_{it}) + \beta 7_t (Size_{it}) + \beta 8_t \big((Financial\ Structure)_{i,t}\big) + Fixed\ Effects + \varepsilon_{it}$$

where:

Firm Profitability is measured by Return on assets (ROA_{it}),

High represents a binary variable that equals one if the corresponding parameter is in the top thirty percent of the sample and zero otherwise,

Low represents a binary variable that equals one if the corresponding parameter is in the bottom thirty percent of the sample and zero otherwise,

Control variables are used to cover the factors of size, sales growth and financial structure,

Fixed Effects control for firm, year and country specific effects.

The first three regression models aim to test how ESG ratings are associated with firm's overall performance and in what extent. ESG parameter in model (1) represents the overall impact of ESG and assumes that the variable contains linear relationship with ROA. This might be restrictive assumption in getting real impact of ESG as the variable is treated in ordinal way. To treat this possible issue, the second model accounts for nonlinearity relation between ESG and firm profitability. This is done by replacing the overall ESG impact with two dummy variables. The dummies specify whether a firm belongs into the top or bottom thirty percent of ESG performers. Third model goes beyond this and splits ESG rating into its individual dimensions. The aim is to test whether the top and bottom thirty percent of individual E, S and G parameters have different and more significant impact on $ROA_{i,t}$ than the other.

The second objective of this research is to test how ESG ratings are associated with firm's market valuation. For this relation, another pooled OLS regression model is introduced. Dependent variable in this analysis is the market valuation, which is measured by *Tobin's Q*. ESG rating is again the primary variable that is in interest. Following previous studies (Aggarwal, Erel, Stulz, & Williamson 2010, Mishra 2015, Gupta, Banerjee & Onur 2017),

Tobin's Q is computed by the sum of total assets less the book value of equity plus the market value of equity divided by the total assets. For corporate responsibility performance, the same ESG assessment is utilized as in the previous models.

The following regression models are built to test ESG impact on firm's market valuation:

(4) $$Market\ Valuation_{i,t} = \alpha_t + \beta 1_t\ (ESG_{it}) + \beta 2_t (Control\ variables) + \varepsilon_{it}$$

(5) $$Market\ Valuation_{i,t} = \alpha_t + \beta 1_t\ (High\ ESG_{it}) + \beta 2_t\ (Low\ ESG_{it}) + \beta 3_t (Control\ variables) + \varepsilon_{it}$$

(6) $$Market\ Valuation_{i,t} = \alpha_t + \beta 1_t\ (High\ E_{it}) + \beta 2_t\ (Low\ E_{it}) + \beta 3_t\ (High\ S_{it}) + \beta 4_t\ (Low\ S_{it}) + \beta 5_t\ (High\ G_{it}) + \beta 6_t\ (Low\ G_{it}) + \beta 7_t (Control\ variables) + \varepsilon_{it}$$

where:
Market Valuation$_{i,t}$ is measured by Tobin's Q and market to book ratio.
High represents a binary variable that equals one if the corresponding parameter is in the top thirty percent of the sample and zero otherwise,
Low represents a binary variable that equals one if the corresponding parameter is in the bottom thirty percent of the sample and zero otherwise,
Control variables are used to cover the factors of last year's sales growth, years in stock exchange, size and profitability,
Fixed Effects control for firm, year and country specific effects.

The fourth regression model examines if ESG rating has linear relationship on market valuation of firm. The fifth model tests the impact by replacing the overall ESG rating with two dummy variables to use the top and bottom thirty percent of ESG performers. The sixth model splits the model further and examines whether individual ESG parameters have

explanatory power on market valuation. For each dimension, I use two binary variables to capture the top and bottom thirty percent of the sample.

The last objective of this research is to test the relationship between the corporate's responsibility performance and cost of debt. *Cost of debt (Kd_t)* is measured by the interest expense on debt divided by total debt. For corporate responsibility performance, I use the same ESG computation as mentioned earlier.

The final objective is tested with the following regression models:

(7) $$Cost\ of\ debt_{i,t} = \alpha_t + \beta 1_t\left(ESG_{i,t-1}\right) + \beta 2_t(Control\ variables) + \varepsilon_{it}$$

(8) $$Cost\ of\ debt_{i,t} = \alpha_t + \beta 1_t\left(High\ ESG_{i,t-1}\right) + \beta 2_t\left(Low\ ESG_{i,t-1}\right) + \beta 3_t(Control\ variables) + \varepsilon_{it}$$

(9) $$Cost\ of\ debt_{i,t} = \alpha_t + \beta 1_t\left(High\ E_{i,t-1}\right) + \beta 2_t\left(Low\ E_{i,t-1}\right) + \beta 3_t\left(High\ S_{i,t-1}\right) + \beta 4_t\left(Low\ S_{i,t-1}\right) + \beta 5_t\left(High\ G_{i,t-1}\right) + \beta 6_t\left(Low\ G_{i,t-1}\right) + \beta 7_t(Control\ variables) + \varepsilon_{it}$$

where:

Cost of debt$_{,t}$ is measured by the interest expense on debt divided by total debt,

High represents a binary variable that equals one if the corresponding parameter is in the top thirty percent of the sample and zero otherwise,

Low represents a binary variable that equals one if the corresponding parameter is in the bottom thirty percent of the sample and zero otherwise,

Control variables are used to cover factors such as size, sales growth, financial structure, profitability and years in stock exchange,

Fixed Effects control for firm, year and country specific effects.

The seventh regression model tests if $ESG_{i,t-1}$ can explain cost of debt at time t based on the whole sample. Linear relationship is assumed and may cause unrealistic impacts. Regression model eight accounts for the possible nonlinearity relation by setting two binary variables, which get value equal to one if firm's ESG performance is in the top or bottom thirty percent and zero otherwise. The last regression model (9) tests the impact of environmental, social and governance parameters. I use the binary variables in this model including the top and bottom thirty percent of E, S and G performers.

4.5. Research hypothesis

Based on the previous findings, corporate responsibility performance has rather controversial evidence and outcomes vary along the time and geographical location. Also, methods and proxies for corporate responsibility performance are not universally agreed. Theories suggest that firms may achieve competitive advantage by enhancing corporate responsibility, which enables better financial performance (Crane et al. 2014:76-80). Previous findings also claim that ESG impact is real and affects financial characteristics of firms. For instance, Guenster et al. (2010), Kim, K. et al. (2015) & Genedy (2017) document positive link between corporate responsibility performance and different profitability measures. In contrast, Aupperle (1985) could not find any significant implications.

Following the recent literature, it is reasonable to argue that corporate responsibility has become central element in today's business world and affects every firm in some extent. The first hypothesis of this research is motivated by the previous findings and states that:

H_1: High ESG performance contributes positively to firm profitability.

In addition to profitability, firm valuation is also considerable indicator of firm performance and positioning in the market. Previous findings suggest that better non-financial performance leads to higher firm valuation by the financial markets. Guenster et al. (2010),

Gregory et al. (2014) & Ioannou et al. (2016) find that better non-financial reporting and performance are value-enhancing and priced in equity markets. According to recent findings, corporate responsibility performance is linked with higher firm valuation.

These findings form the fundament of my second argument that relates to the ESG impact on firm valuation. I argue that,

H_2: High ESG performance is positively associated with market valuation.

Last area of this research concentrates on the possible cost of debt benefits that are driven by the ESG performance. Modern theories of corporate social responsibility suggest that information asymmetry and agency costs are reduced by better responsibility practices (Crane et al. 2014). Previous findings are support the theory. Cheng et al. (2017) and Erragragui (2017) confirm that virtuous environmental and governance behavior are significant contributors in reducing cost of capital. Hsu and Chen (2015) also find that better corporate responsibility performance reduces the cost of capital.

According to the findings, I formulate the third hypothesis of this thesis that is tested. I state that,

H_3: Cost of debt is inversely associated with ESG performance across Nordic countries.

Next chapter follows the hypothesis and presents empirical findings of this research.

5. EMPIRICAL ANALYSIS

In this chapter ESG impact is empirically tested with several regression models on profitability, valuation and cost of debt. The section begins by the analysis of profitability results, which is followed by the analysis of valuation and cost of debt results. Regression results for profitability are found on the table 5 and 6. While results on valuation are found on the table 7 and 8. And lastly, tables 9 and 10 display results on cost of debt.

5.1. Regression results on profitability

To begin with, I run regression models to test how profitability is correlated with the overall ESG rating. Linear relationship is assumed in the first model. As suggested earlier, ESG impact might not provide purely linear relationship when the whole data set is used. Therefore, model (2) and (3) take more concentrated approach to avoid the possible issue. The first model provides directional results and set framework for further tests.

Table 5 shows that there is a positive and significant relationship between the overall ESG ratings and ROA. Especially when country effects are controlled, ESG score coefficient variable is positive (0,03) and statistically significant at 1% level. Thus, if ESG rating increases by 10 units, it is associated with 0,3% increase in ROA. Although, the result is statistically significant, financial impact is low.

For comparison purposes, ESG impact is regressed on ROE. Results illustrate that ESG scores have opposing association between ROE. The coefficient of ESG score is negative and significant. When time and firm effects are controlled, ROE drops 0,20% for an increase of one unit in ESG rating. Similar but even stronger impact is reported after country effects are controlled (-0,30***). The results in the first model indicate that ESG ratings have positive association between ROA and negative between ROE.

Table 5. Regression results on profitability.

	(1) ROA %		(1) ROE %		(2) ROA %		(2) ROE %	
Intercept	1,30	37,23***	-118,30**	-136,91***	-0,89	39,41***	-123,93**	-156,01***
	(13,46)	(2.12)	(51,15)	(10,82)	(13,50)	(2,10)	(51,54)	(11,49)
ESG score	-0,01	0,03***	-0,20**	-0,30***				
	(0,02)	(0,01)	(0,09)	(0,06)				
High ESG score					1,71***	0,81	-4,71	-16,17***
					(0,51)	(0,57)	(3,14)	(3,20)
Low ESG score					1,60**	-1,23**	5,55*	3,22
					(0,71)	(0,62)	(3,32)	(3,10)
Ln total assets (thousands)	1,15	-1,46***	11,50***	11,28***	1,18	-1,46***	11,06***	11,56***
	(0,90)	(0,15)	(3,39)	(0,76)	(0,88)	(0,15)	(3,36)	(0,76)
Debt-to-asset %	-0,18***	-0,12***	-0,62***	-0,06	-0,17***	-0,13***	-0,61***	-0,05
	(0,03)	(0,02)	(0,13)	(0,08)	(0,03)	(0,02)	(0,13)	(0,08)
Fixed effects								
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	No	Yes	No	Yes	No	Yes	No
Country	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted R-squared	0,54	0,14	0,60	0,26	0,54	0,14	0,60	0,26
Observations	2065	2065	1761	1761	2065	2065	1761	1761

Robust standard errors are presented in the parentheses below the corresponding correlation coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (1) and (2) are regressed for ROA% and ROE%.

The second regression model shows that when firm belongs to high ESG group, return on assets are significantly higher (1,71***) when compared to the whole data set. However, low ESG ratings are associated with nearly equal ROA (1,60***). The difference between the two is more dramatic after country effect is controlled. Under this specification, low ESG score has negative loading on ROA with 5% significance level (-1,23**). In contrast, high ESG group has positive contribution to ROA. However, the contribution is not statistically significant.

When the same ESG group is regressed for ROE, the correlation changes significantly. In the last two columns in table 5, High ESG ratings are associated consistently with lower ROE and oppositely Low ESG ratings with higher ROE. The impact is the most extreme in the last column, in which high ESG ratings have the most negative impact on ROE (-16,17***). When the model is controlled for firm and country effects, low ESG ratings have significant and substantial impact on ROE (5,55*).

The last regression model on table 6 tests if individual ESG parameters can explain the percentage of ROA and ROE. Each model includes controlled year effects, whilst the first regression is controlled for firm and the latter for country effects. The former model does not result in significant results for any ESG parameter. The latter, on the other hand, provides significant coefficients for high and low social performance as well as high and low governance performance. More explicitly, high social performance is linked with higher ROA (3,41***), while the link is negative once social performance is low. What is more surprising is that high corporate governance is linked negatively (-1,39*) and low corporate governance positively with ROA (1,44*). In other words, social dimension seems to support the hypothesis, whereas the governance parameter argues against it.

ESG performance generates somewhat opposing results for ROE. Significant coefficients are found for high environmental and governance scores as well as for Low environmental performance. High environmental and governance performances have negative loadings on ROE (-9,32***, -8,20*** respectively), whereas poor social performance has positive

loading on ROE (6,45**). The results suggest that firms with high environmental and governance performance are faced with lower ROE, while low social performance is linked with better ROE.

Table 6. Regression results on profitability continued.

	(3) ROA %		(3) ROE %	
Intercept	-1,18	40,96***	-121,04**	-152,77***
	(13,62)	(2,11)	(51,55)	(11,62)
High E	0,66	0,71	-4,85	-9,32***
	(0,52)	(0,61)	(3,22)	(3,43)
High S	0,77	3,41***	-3,92	1,87
	(0,48)	(0,63)	(3,09)	(3,44)
High G	0,37	-1,39**	2,28	-8,20***
	(0,53)	(0,59)	(2,76)	(3,16)
Low E	0,69	0,16	1,73	3,73
	(0,78)	(0,67)	(3,86)	(3,60)
Low S	0,83	-1,17*	6,45**	2,54
	(0,69)	(0,66)	(3,40)	(3,65)
Low G	0,79	1,44**	-4,15	1,92
	(0,63)	(0,68)	(3,07)	(3,44)
Ln total assets (thousands)	1,18	-1,65***	10,98***	11,29***
	(0,89)	(0,15)	(3,37)	(0,78)
Debt-to-asset %	-0,17***	-0,12***	-0,63***	-0,06
	(0,03)	(0,02)	(0,13)	(0,08)
Fixed Effects				
Year	Yes	Yes	Yes	Yes
Firm	Yes	No	Yes	No
Country	No	Yes	No	Yes

Robust standard errors are presented in the parentheses below the corresponding correlation coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (3) is regressed for ROA% and ROE%.

The first part of this empirical analysis supports the thesis in that the overall ESG score and ROA are positively associated; however, the impact is rather low. Same calculation for ROE results in negative ESG coefficient that goes against the thesis.

The second regression model shows similar controversy. The impact of ESG is positive on ROA and negative on ROE. The result suggests that ESG performers are rewarded with higher profitability in terms of ROA; however, the performance is associated negatively with ROE. Therefore, it can be said that better ESG performance is not rewarded in equity returns but rather in asset returns.

Third model goes slightly deeper and tests individual contribution of each ESG dimension. If profitability is measured by ROA, better social performance is associated with higher ROA. On the other hand, if profitability is measured by ROE, poor social performance seems to result in higher returns.

Noteworthy is that high ESG parameters are generally associated with positive returns on assets and negative returns on equity. In other words, better ESG performance contributes positively on ROA, but oppositely harms ROE.

5.2. Regression results on valuation

The second part of the empirical analysis tests whether ESG performance is already priced in equity markets in terms of higher market valuation. Tobin's q and market-to-book ratio are used to measure firm valuation. The fourth model in table 7 shows the test results for the overall ESG impact on firm valuation. The contribution is slightly positive after the country effects are controlled, but the impact is nearly zero. Therefore, it can be said that there is statistically significant relationship but the financial impact is minor. Sales growth and years in stock exchange are not demonstrated in the table due to insignificant results.

Table 7. Regression results on valuation.

	(4) Tobin's q		(4) M/B		(5) Tobin's q		(5) M/B	
Intercept	3,75***	2,15***	7,31***	5,03***	3,75***	2,36***	7,69***	5,53***
	(0,76)	(0,22)	(2,37)	(0,59)	(0,77)	(0,23)	(2,39)	(0,60)
ESG score	0,00	0,00*	0,00	0,01**				
	(0,00)	(0,00)	(0,00)	(0,00)				
High ESG score					0,18***	0,09*	0,31***	0,20*
					(0,04)	(0,05)	(0,12)	(0,11)
Low ESG score					0,01	-0,09*	-0,04	-0,26*
					(0,06)	(0,05)	(0,14)	(0,14)
Ln total assets (thousands)	-0,16***	-0,08***	-0,33**	-0,25***	-0,16***	-0,08***	-0,36**	-0,26***
	(0,05)	(0,01)	(0,16)	(0,04)	(0,05)	(0,01)	(0,16)	(0,03)
ROA	2,74***	5,13***	6,02***	9,08***	2,71***	5,11***	5,98***	9,10***
	(0,32)	(0,42)	(0,99)	(0,90)	(0,32)	(0,42)	(0,98)	(0,89)
Fixed effects								
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	No	Yes	No	Yes	No	Yes	No
Country	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted R squared	0,76	0,41	0,64	0,30	0,77	0,41	0,64	0,30
Observations	1724	1724	1595	1595	1724	1724	1595	1595

Robust standard errors are presented in the parentheses below the corresponding coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (4) and (5) are run for tobin's q and market-to-book ratio.

The fifth model tests if either the top or bottom thirty percent of ESG performers have statistical power in explaining firms' market valuation. For the top thirty percent of ESG performers, the valuation measures are associated with positive and statistically significant coefficients in each model. In contrast, two of the four Low ESG performers have negative and significant impact. Other two result in statistically insignificant coefficients. The results on the fifth model support the second hypothesis and it is evident that ESG is priced in firm's market valuation.

Lastly, the sixth regression model in table 8 shows the impact of each ESG parameter separately. For the high ESG performers, the contribution is positive and significant in eight out of the twelve regression models. The coefficient are positive and significant on high environmental, social and governance dummies. High environmental performance generates the most consistent and significant coefficients across all the models ranging from 0,08* to 0,29**. High social performance also generates positive impact in each regression, although one coefficient is statistically insignificant. High governance performance, on the other hand, seems to be the least effective parameter. Nonetheless, half of the regressions report positive and significant impact for high governance dummy. The results are consistent with both valuation measures.

In contrast, low ESG performing seems to generate less explaining power in firm's market valuation. Only three out of the twelve regressions provide significant results. And for those three, the coefficients are positive for two and negative for one. Thus, it is clear that low ESG performing is not as important factor in firm's market valuation as high ESG performing. In other words, the results provide significant evience that high ESG performing firms have higher valuation, but at the same time, low ESG performing is not associated with lower valuation. Therefore, firms benefit from good ESG performing, but are not penalized from bad ESG performing. This partially supports the second hypothesis, but as it appears, ESG performance does not have a linear relationship with the valuation.

Table 8. Regression results on valuation continued.

	(6) Tobin's q		(6) M/B	
Intercept	3,69***	2,49***	7,21***	5,73***
	(0,76)	(0,22)	(2,37)	(0,62)
High E	0,08*	0,11**	0,27**	0,29**
	(0,05)	(0,05)	(0,14)	(0,13)
High S	0,10***	0,25***	0,16	0,52***
	(0,04)	(0,05)	(0,11)	(0,12)
High G	0,10***	-0,02	0,20*	-0,02
	(0,03)	(0,05)	(0,11)	(0,13)
Low E	-0,01	0,06	0,16	0,54***
	(0,06)	(0,06)	(0,15)	(0,16)
Low S	0,09*	-0,03	0,10	-0,36**
	(0,05)	(0,06)	(0,14)	(0,14)
Low G	0,02	0,05	0,07	0,04
	(0,05)	(0,06)	(0,14)	(0,15)
Ln total assets (thousands)	-0,15***	-0,10***	-0,34**	-0,29***
	(0,05)	(0,01)	(0,16)	(0,04)
ROA	2,68***	4,98***	5,92***	8,82***
	(0,32)	(0,42)	(0,99)	(0,87)
Fixed Effects				
Firm	Yes	No	Yes	No
Year	Yes	Yes	Yes	Yes
Country	No	Yes	No	Yes
Adjusted R squared	0,77	0,42	0,64	0,32
Observations	1724	1724	1595	1595

Robust standard errors are presented in the parentheses below the corresponding correlation coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (6) is regressed on tobin's q and market-to-book ratio.

5.3. Regression results on cost of debt

Last part of the empirical testing uncovers ESG impact on cost of debt. Generalized cost of debt is used in the analysis. The seventh regression model in table 9 shows the overall ESG impact on cost of debt. As it appears, overall ESG performance does not have major economic impact on cost of debt Sales growth and years in stock exchange provide insignificant results and are left out from the table.

The eight regression model neither provides any consistent relation between ESG and cost of debt. However, what is noteworthy is that Low ESG performers have more negative relation with the cost of debt than High ESG performers. This would suggest that firms with lower ESG performance have lower cost of debt. However, the result is only significant on the other latter model and is not consistent.

Table 9. Regression results on cost of debt.

	(7)		(8)	
Intercept	17,11***	13,74***	17,85***	14,05***
	(5,06)	(0,10)	(5,58)	(1,26)
ESG score	0,01	0,01**		
	(0,01)	(0,01)		
High ESG			-0,04	-0,14
			(0,34)	(0,27)
Low ESG			-0,40	-0,54*
			(0,29)	(0,30)
Ln total assets (thousands)	-0,56*	-0,46***	-0,53	-0,44***
	(0,33)	(0,07)	(0,36)	(0,07)
Debt-to-assets %	-0,14***	-0,08***	-0,14***	-0,08***
	(0,01)	(0,01)	(0,02)	(0,01)
ROA %	-0,03*	0,03***	-0,03*	0,04*
Fixed effects	(0,01)	(0,01)	(0,01)	(0,02)
firm	Yes	No	Yes	No
year	Yes	Yes	Yes	Yes
country	No	Yes	No	Yes
Adjusted R-squared	0,35	0,17	0,35	0,17
Observations	1804	1804	1804	1804

Robust standard errors are presented in the parentheses below the corresponding correlation coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (6) is regressed on tobin's q and market-to-book ratio.

The ninth regression model reports that two out of the twelve key variables provide significant results. Among the high performing variables, only three out of six coefficients are negative and from those three, two are statistically significant. More specifically, high social performance provides 0,51%* lower cost of debt. The relation holds on both regressions and coefficients are nearly equal.

In contrast, low ESG performers are mainly associated with negative values. However, statistical significance is not found. The results suggest that high social performance is the only factor that is considered significant in explaining next year's cost of debt. Overall, it seems that ESG parameters are not priced in debt market as effectively as in equity market. Only the top social performers achieve borrowing cost benefits at some extent. Therefore, the third hypothesis is not supported as ESG impact on cost of debt is not different from zero.

Table 10. Regression results on cost of debt continued.

	(9)			
Intercept	17,81***	(5,62)	13,99***	(1,22)
High E (-1)	0,29	(0,39)	0,35	(0,29)
High S (-1)	-0,51*	(0,30)	-0,49*	(0,28)
High G (-1)	-0,17	(0,25)	0,05	(0,26)
Low E (-1)	-0,53	(0,34)	-0,37	(0,28)
Low S (-1)	-0,19	(0,35)	-0,21	(0,30)
Low G (-1)	0,34	(0,33)	-0,10	(0,32)
Ln total assets (thousands)	-0,52	(0,36)	-0,44***	(0,06)
Sales growth (1Y) %	-1,05	(1,01)	-1,01**	(0,42)
Debt-to-assets %	-0,14***	(0,02)	-0,08***	(0,01)
ROA	-3,23*	(1,22)	4,04*	(2,34)
Fixed effects				
firm	Yes	Yes	No	No
year	Yes	Yes	Yes	Yes
country	No	No	Yes	Yes
Adjusted R-squared	0,35	0,35	0,17	0,17
Observations	1804	1804	1804	1804

Robust standard errors are presented in the parentheses below the corresponding coefficient. Significant levels: * = 10%, ** = 5% and *** = 1%. Model (6) is regressed on tobin's q and market-to-book ratio.

5.4. Summary of regression results

First part of the analysis partially supports the first hypothesis as the ESG has generally positive impact on ROA. However, when profitability is measured by ROE, the impact does not hold and is reverse. This contradiction is consistent on multiple regressions. Social and governance ratings seem to be the largest contributors to profitability. High social performance contributes positively and low performance negatively to ROA. Adversely, low social performance impact positively on ROE. High corporate governance score is negatively associated with profitability, whereas low governance score is linked with higher ROA. Therefore, the first part of the analysis partly supports the first hypothesis as ESG performance is rewarded with higher return on assets, although returns on equity are smaller. In other words, better ESG performance contributes positively to ROA, but harms ROE.

The second part of the analysis finds some evidence to support the second hypothesis. Results on the table 7 and 8 show that high ESG performers are associated with significantly higher market valuation, while low ESG performers do not provide statistical significant results. In other words, firms benefit from good ESG performance, but at the same time they are not harmed from bad ESG performance. As it appears, ESG performance does not have a linear relationship with the valuation and results suggest that low ESG performance is not as important factor as high ESG performance in firm's market valuation.

Lastly, third part of the analysis does not find coherent evidence to support the third hypothesis as firms with high ESG performance are not rewarded with lower borrowing cost. High social performance seems to be the only significant factor in reducing cost of debt. Overall, it seems that ESG parameters are not priced in debt market as effectively as in equity market. Therefore, the third hypothesis is not supported and ESG impact on cost of debt is not different from zero.

6. CONCLUSIONS

The purpose of this paper was to contribute in corporate responsibility area and test whether ESG impact exists in Nordic region. Large number of academic research has dedicated time on this subject, yet empirical findings are rather contradictory. To add my contribution on the matter, I was intrigued to examine how the topic settle in Nordic countries. More explicitly, I investigated how responsibility performance drives financial value and in what extent in the region. Corporate responsibility performance was measured by using ESG scores obtained from Thomson Reuters. Thus, main objectives of this thesis were to examine how ESG performance is associated with profitability, valuation and borrowing cost among listed firms in Nordic countries.

The first part of the research presented the latest movement in corporate responsibility and showed how non-financial matters have become essential in firms' daily based operation. Theories around modern finance also consider corporate responsibility as an important driver in long-term success. Some of the theories argue that firm is better off by taking all the stakeholders into consideration in business decisions. Profit maximization introduced by Milton Friedman is no longer the only objective, but the means how profits are acquired has become essential. Nonetheless, the subject has remained rather controversial and direct implications on financial value is obscure.

Previous findings suggest that ESG information is more frequently applied by professional investors in assessing underlying risks around firms. Influence on firm profitability and valuation seem to be positively associated with better responsibility performance (Guenster et al. 2010 & Genedy et al. 2017). Firms also appear to benefit from better responsibility performance in terms of lower borrowing cost and easier access to finance. The link is considered to relate to the reduction of information asymmetry, agency costs and bankruptcy risk (Cheng et al. 2017 & Erragragui 2017).

Findings of this thesis partially support the previous findings and theories, but at the same time, some theories are not supported. ESG impact is positive and significant on firm's market valuation. When firm belongs to the top ESG performer, it is rewarded with higher market valuation. On the other hand, if firm belongs to the bottom ESG performing group, there is no evidence for lower market valuation. Thus, it can be concluded that only the firms with very high ESG performance are affected by ESG matter.

ESG regression on profitability provides interesting results. While better ESG performance drives positive returns on assets, it results in lower returns on equity. This would suggest that firms tend to use equity prior to assets in improving ESG performance. To validate this implication, further empirical analysis should be made.

Regression results on cost of debt does not support findings of Cheng et al. (2017) and Erragragui et al. (2017). Based on this research, ESG performance or its individual parameters are not applied in debt markets as effectively as in equity markets. According to this study, total charge for taking on a debt obligation is not associated with neither lower or higher cost of debt among publicly listed firms in Nordic countries.

This study concentrated on Nordic countries as whole, without further examining ESG impact on individual countries. This could be an area for further research and test whether the impact is more significant for some country. However, data availability challenges this kind of analysis at this point as ESG information providers do not grant access free of charge. Industry specific effects were not an objective of this research, which leaves space for future testing as well. How ESG performance is associated with other forms of profitability measures such as EBIT, EBITDA or FCFs would add more contribution on the matter.

Overall, the results of this paper suggest that very high ESG performance is rewarded with higher market valuation and return on assets. On the other hand, ROE is lower for high ESG performers and borrowing cost is not statistically associated firm's ESG performance.

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