Laura Tenhovuori

Corporate social responsibility and financial performance during the COVID-19 pandemic

Evidence from Nordic firms

School of Accounting and Finance
Master's thesis in Finance
Master's Degree Programme in Finance

Vaasa 2022

UNIVERSITY OF VAASA
School of Accounting and Finance
Author: Laura Tenhovuori
Title of the Thesis: Corporate social responsibility and financial performance during the COVID-19 pandemic: Evidence from Nordic firms
Degree: Master of Science in Economics and Business Administration
Programme: Master's Degree Programme in Finance
Supervisor: Sami Vähämaa
Year: 2022 **Pages:** 91

ABSTRACT:
The relationship between corporate social responsibility and financial performance has been an ongoing subject relating to whether firms should invest in CSR activities or not. The question is do the benefits outweigh the costs, but unfortunately, research in the field has found inconclusive results. The COVID-19 pandemic presents an unexpected external shock to the stock market, which allows for a setting to examine whether firms engaging in CSR activities outperform companies with lower amounts of CSR engagement.

This thesis examines the relationship between corporate social responsibility and corporate financial performance during the COVID-19 pandemic. The main questions under investigation are whether companies with higher CSR ratings outperform companies with lower CSR ratings. Also, the study aims to answer whether there is a relationship between CSR scores and volatility during times of pandemics. The study is conducted using a Nordic sample of firms listed on the stock exchanges and that have received CSR-related ratings. In this thesis, the Nordic countries consist of Denmark, Finland, Norway, and Sweden. The sample also allows for examining how different lockdown procedures affected corporate financial performance. Although the Nordic countries have similar characteristics, governmental structures, and demographics, Sweden decided on different social distancing measures compared to the other Nordics in the sample.

The study uses both market-based and accounting-based measures to evaluate corporate financial performance during the pandemic. Dependent variables that are implemented include stock returns, volatility, and operating performance measures. The results are obtained using cross-sectional regressions and difference-in-differences regressions. Using two types of regressions allows for a broader analysis of the effects of the pandemic. In addition, the thesis incorporates robustness tests to evaluate the results further.

The results of the study suggest that companies with high CSR ratings are not superior to those with lower CSR scores. Regressions with quarterly abnormal returns as dependent variables suggest the opposite. When studying yearly abnormal returns, the results are not statistically significant. In countries that implemented social distancing measures, the quarterly abnormal returns are negatively correlated with ES scores. The study finds a negative relationship between CSR and operational performance, but this is based on one model of six. The results for a negative relationship are also found in the Swedish sample, but not in a sample consisting of the countries that implemented stricter social distancing measures. Furthermore, the results suggest a significant and negative correlation between CSR and volatility. The results are the same in all Nordic countries.

KEYWORDS: Corporate Social Responsibility, Financial performance, COVID-19, Nordic firms, volatility

VAASAN YLIOPISTO
Laskentatoimen ja rahoituksen yksikkö
Tekijä: Laura Tenhovuori
Tutkielman nimi: Corporate social responsibility and financial performance during the COVID-19 pandemic: Evidence from Nordic firms
Tutkinto: Kauppatieteiden maisteri
Oppiaine: Rahoitus
Työn ohjaaja: Sami Vähämaa
Valmistumisvuosi: 2022 **Sivumäärä:** 91

TIIVISTELMÄ:
Vastuullisuuden ja yrityksen taloudellisen suorituskyvyn välinen suhde on ollut jatkuva puheenaihe liittyen siihen pitäisikö yrityksen investoida vastuullisiin toimintatapoihin vai ei. Kysymyksenä on, ovatko vastuullisuuden tuomat hyödyt kustannuksia suuremmat, mutta aiempi tieteellinen tutkimus ei ole löytänyt tähän yhtä oikeaa vastausta. COVID-19 pandemia on eräänlainen ulkopuolinen odottamaton shokki osakemarkkinoille. Tämä mahdollistaa sen tutkimisen, suoriutuvatko yritykset, jotka ovat investoineet enemmän vastuullisuuteen paremmin kuin yritykset, joilla on vähemmän vastuullisuuteen tähtääviä investointeja.

Tämä tutkielma tarkastelee vastuullisuuden ja yrityksen taloudellisen suorituskyvyn suhdetta COVID-19 pandemian aikana. Tutkimuksen pääkysymyksenä on, suoriutuvatko korkeammalle luokitellut yritykset paremmin kuin yritykset, joilla on matalammat vastuullisuusluokitukset. Tutkielma pyrkii myös löytämään vastauksen siihen, onko vastuullisuusluokitusten ja volatiliteetin välillä suhde pandemiatilanteessa. Tutkimuksessa on käytetty pohjoismaista kohdejoukkoa pörssilistatuista yrityksistä, joilla on vastuullisuusluokitukset. Tässä tutkimuksessa pohjoismaat koostuvat Tanskasta, Suomesta, Norjasta ja Ruotsista. Kohdejoukko mahdollistaa myös erilaisten rajoituskäytäntöjen vaikutuksen tutkimisen. Vaikka pohjoismaita kuvataan samankaltaisiksi piirteiltään, valtion rakenteiltaan sekä väestörakenteeltaan, Ruotsin rajoitustoimenpiteet COVID-19 aikana olivat erilaiset kuin muissa kohdejoukon maissa.

Tutkielmassa käytetään sekä markkinaehtoisia että kirjanpitoon perustuvia muuttujia mittaamaan yrityksen taloudellista suoriutumista pandemian aikana. Riippuvaisia muuttujia ovat osaketuotot, volatiliteetti sekä taloudellista suoriutumiskykyä mittaavat tunnusluvut. Empiirisessä osiossa käytetään kahdenlaisia regressiomalleja, mikä mahdollistaa laajemman näkökulman kysymyksien vastaamiseen.

Tutkielman tulokset osoittavat että yritykset, joilla on korkeat vastuullisuusluokitukset eivät suoriudu paremmin kuin yritykset, joilla on matalammat vastuullisuusluokitukset. Kvartaalikohtaiset ylituotot näyttävät osoittavan päinvastaista. Kun tarkastelussa on vuoden ylituotto, tulokset eivät ole tilastollisesti merkitseviä. Maissa, joissa tiukemmat rajoitustoimenpiteet otettiin käyttöön, kvartaalikohtaiset ylituotot ovat negatiivisesti korreloituneita vastuullisuusluokitusten kanssa. Tutkielman tulokset osoittavat myös negatiivisen suhteen vastuullisuuden ja taloudellisen suoriutumiskyvyn välille. Tämä tulos on nähtävissä ruotsalaisten yhtiöiden keskuudessa, mutta ei muissa pohjoismaissa. Lisäksi tulokset osoittavat tilastollisesti merkitsevän negatiivisen korrelaation vastuullisuuden ja volatiliteetin välille.

AVAINSANAT: Corporate Social Responsibility, Financial performance, COVID-19, Nordic firms, volatility

Contents

Figures

Tables

Abbreviations

AT	Asset Turnover
CAPM	Capital Asset Pricing Model
CFP	Corporate Financial Performance
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
ECB	European Central Bank
ES	Environmental and Social
ESG	Environment, Social and Governance
ICB	Industry Classification Benchmark
NODEFI	Norway, Denmark, and Finland
OPM	Operating profit margin
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
SGA	Selling, General, and Administrative expenses
SIC	Stakeholder Influence Capacity
SRI	Socially responsible investing
VIF	Variance inflation factor
WHO	World Health Organization

1 Introduction

Corporate social responsibility (CSR) is an extensively researched phenomenon and has been increasing in importance during the last decade. For example, according to the Global Sustainable Investment Alliance (2018), assets under management had grown 34 % globally between the years 2016 – 2018, showing the growing trend and interest in investing in socially responsible investments.

The concept of corporate social responsibility is well known, but one specific definition has not been defined. Bowen, Gond, and Bowen (2013) introduces the idea that businesses hold a social responsibility. He argues that as people in business make decisions on product diversity and employee amounts, they contribute to a broader impact. According to Bowen, Gond, and Bowen (2013), this would mean businesses should consider the social consequences of their actions. He discusses that it is the activities undertaken that are to be debated.

Since there has been an ongoing discussion on the subject and whether firms should invest in CSR activities. Corporate social responsibility has brought up questions about the financial outcome of CSR-related investments. Do the financial benefits of these socially responsible investments outweigh the costs? For example, Barnett (2007) argues that if CSR investments generate more profits than costs, the investment is wise; otherwise, it causes an agency problem. Unfortunately, the results in the field have overall been inconclusive. Researchers argue that the problem is that all studies aim to provide a conclusive result, but the inconclusive results seem to be as debatable as the ethical dilemma itself (Margolis and Walsh, 2003.)

As investors consider investments to pursue, CSR attributes should be increasingly considered. The decisions of investors are reflected in the market-based measures of corporate financial performance (CFP), which is why it might be argued that companies should consider engaging in CSR-related activities in their operations. In addition, market shocks and sharp stock price declines may be why potential investors fear the market. Therefore,

CSR might increase its role in the decision-making regarding market shocks as previous literature finds substantial evidence of CSR outperforming conventional firms. For example, Lins, Servaes, and Tamayo (2017) find firms with high CSR ratings to outperform conventional firms in times of shock, especially during the financial crisis of 2008. Furthermore, investors have been found to be more likely to keep their investments in firms that have high CSR ratings compared to conventional firms in a market sell-off situation. Moreover, firms with high CSR ratings have been found to display lower risk (Nofsinger and Varma, 2014).

At the beginning of 2020, substantial market declines resulted from the spread of COVID-19. Historical lockdown procedures were implemented globally, causing economic activity and consumption to decline. On the 11th of March, 2020, the World Health Organization (WHO) declared the COVID-19 disease outbreak a global pandemic (WHO, 2020). The global pandemic caused a severe market downturn and resulted in an economic shock that was not caused by the financial markets as in 2008 or an industry bubble.

This study examines corporate social responsibility and firm performance during COVID-19. Studying the pandemic period is critical, as reflected by the COVID-19 outbreak. Exceptional lockdown measures affected global supply chains when employees were forced to remain at home. As the world continues on the path of globalization and countries become more interdependent, the possibility of a pandemic rises. Moreover, the crisis was different from the financial crisis in 2008-2009 as the economy was reliant on the development of the virus, which is even two years later slightly uncertain, considering the current situation in China (April 2022). Therefore, this study is essential in order to examine whether companies that engage in CSR activities can provide insurance against exogeneous shocks such as pandemics caused by viruses.

Moreover, this study will consider the causal effect that has been presented in academic literature. This means examining if firms with high profits can invest in CSR activities and therefore gain higher ratings concerning CSR. Or do CSR activities generate higher profits,

greater stock valuations, and smaller risk, resulting in the highly-rated firms outperforming conventional firms?

1.1 Purpose and motivation of the study

Motivated by the study of Albuquerque, Koskinen, Yang, and Zhang (2020) and the findings of Lins, Tamayo, and Servaes (2017), the study examines whether companies with high levels of CSR are more robust to market shocks than firms with lower CSR scores. The purpose of this study is to examine, how high-CSR firms perform in the market shock and during the recovery period after the initial shock. Albuquerque et al. (2020) noted that the influence of a shock is seen with a delay in accounting numbers. Therefore, this study will examine a more extended period after the initial shock and facilitate the analysis of accounting numbers and the stock returns.

The importance of the study is its uniqueness. As far as I know, there are no research papers published evaluating the relationship between corporate social responsibility and corporate financial performance distinctively during times of pandemics in the Nordic countries. Even more so examining corporate financial performance by the means of both market-based and accounting-based measures. As presented in chapter 4, most studies focus on the U.S. sample. This study examines the current pandemic period related to the COVID-19. This thesis aims to answer whether CSR actions provide insurance, as some studies suggest. For example, Lins, Servaes, and Tamayo (2017) show that the firms with high CSR levels outperformed the firms with low CSR levels during the financial crisis of 2008-2009. Moreover, the study by Nofsinger and Varma (2014) also provides evidence that acting socially responsibly offers better outcomes in times of crisis. Furthermore, Albuquerque, Koskinen, Yang, and Zhang (2020) find that stock prices of firms with high Environmental & Social (ES) scores perform better than firms with lower ES scores in the first quarter of 2020. In addition, they find operating margins to be higher and volatility lower for firms with high ES scores compared to firms with lower ES scores. These articles are discussed in more depth in the literature review section,

chapter 4. Therefore, the relevance of this study is the examination of a pandemic as a cause of a financial crisis.

Moreover, the Nordic countries are generally known to score high in rankings considering the responsibility issues. The Nordic sample provides a setting in which the countries are similar in characteristics. In their study, Yarmol-Matusiak, Cipriano, and Stranges (2021) describe the public health systems, demographics, culture, and governmental organizations similar within the Nordic countries. As the demographics of the countries are alike, this might anticipate similar social distancing measures or policies placed at the beginning of the pandemic. However, the Nordic sample enables a review of the effects of different lockdown procedures on the relationship between firm performance and corporate social responsibility.

As Gordon, Grafton, and Steinshamn (2021) elaborate, the measures taken at the beginning of the pandemic varied across the Nordic countries. The most notable difference was the contrast between Sweden and the other Nordic countries. Gordon et al. (2021) go through the timeline of events. Norway was the first to implement social distancing measures with remote work and restrictions on domestic travel. Finland and Denmark followed the example and imposed lockdown measures. Sweden relied on the self-assessment of its citizens and, rather than implementing strict lockdown rulings, gave recommendations. Denmark was the first to lift its social distancing measures in April, Norway followed at the start of May, and Finland at the end of May. In addition, similar measures were imposed in Norway, Finland, and Denmark. Finally, Sweden set restrictions in November, and in December, Sweden had the strictest regulations of all Nordic countries. This thesis contributes to the existing research in studying the sample of companies listed in Nordic stock exchanges and compares the effect of CSR scores on firm financial performance in countries with strict lockdown policies to Sweden, where the reactions and measures are COVID-19 were less restrictive. Furthermore, financial performance is measured by both market-based and accounting-based measures, enabling investigation of the investor reaction and solely financial performance. As Rodgers,

Choy, and Guiral (2013) note, this allows for analyzing a firm's financial performance more thoroughly than exclusively by either market-based or accounting-based measures (p. 608).

1.2 Research questions

This study aims to answer the following questions.

1. Do high ES scoring companies outperform companies with low ES performance during a market shock?
2. Is there a relationship between the ES scores and stock volatility during a market shock?

The first research question examines the relationship between CSR and CFP from the view of companies. If engaging in CSR activities benefits the company in higher operational performance during times of market downturn, it might become a question increasing in importance whether companies should invest in processes that are regarded as good from the CSR perspective. The second research question might be interesting to potential investors. High volatility implies uncertainty in the stock returns, which investors might consider a negative characteristic. If the stocks of companies with high CSR ratings experience less volatility during market shocks, they may seem attractive to investors. Increasing investments in the company would provide a higher market valuation for the stock.

1.3 Structure of the study

The thesis is structured as follows. The second chapter introduces the concept of CSR in more depth, initially discussing the definition, CSR in the Nordics, how companies are evaluated, followed by introducing relevant theories behind CSR and concluding with an overview of socially responsible investing. The third chapter discusses corporate financial performance (CFP). The fourth chapter reviews the connections between CSR and

CFP presented in previous literature. The review is divided into relationship regarding times pre-COVID-19 and during COVID-19. This provides a base for the hypothesis development that concludes chapter 4. The fifth chapter describes the data, variables, and methodology in this thesis. The data is mostly constructed from databases the University of Vaasa has access to, but some data is obtained from sources available to the public. The sixth chapter provides a discussion and analysis of the results obtained. The seventh chapter goes through the robustness tests conducted in the thesis. The eighth and final chapter concludes the thesis, discusses limitations, and provides suggestions for further research.

2 Corporate social responsibility

This chapter aims to define corporate social responsibility and go through the environmental, social, and governance (ESG) criteria, which have been developed to evaluate the non-financial actions of firms. This is done to understand the assessment criteria for stating a firm is applying corporate social responsibility in its operations. Furthermore, a brief overview of CSR in Nordic countries is provided to motivate the sample restriction. Finally, to understand the motives around the hypothesis development in the latter part of the thesis, the basics of socially responsible investing will be briefly covered in this section.

2.1 Defining CSR

Corporate social responsibility (CSR) is a vastly discussed topic but has not received one clear definition. Various studies state that the reasons behind an inconclusive description could lie in biases toward a specific definition or the problem at hand, resulting in inconclusiveness in the literature (Dahlsrud, 2008; Margolis and Walsh, 2003).

One extensively cited definition of CSR in academic literature is the pyramid introduced by Carroll (1991). Carroll (1991) proposes four categories in CSR that can be displayed as a pyramid. The pyramid is built up from bottom to top in the following order: economic, legal, ethical, and philanthropic responsibilities. Figure 1 is presented to visualize the format Carroll (1991) introduces.

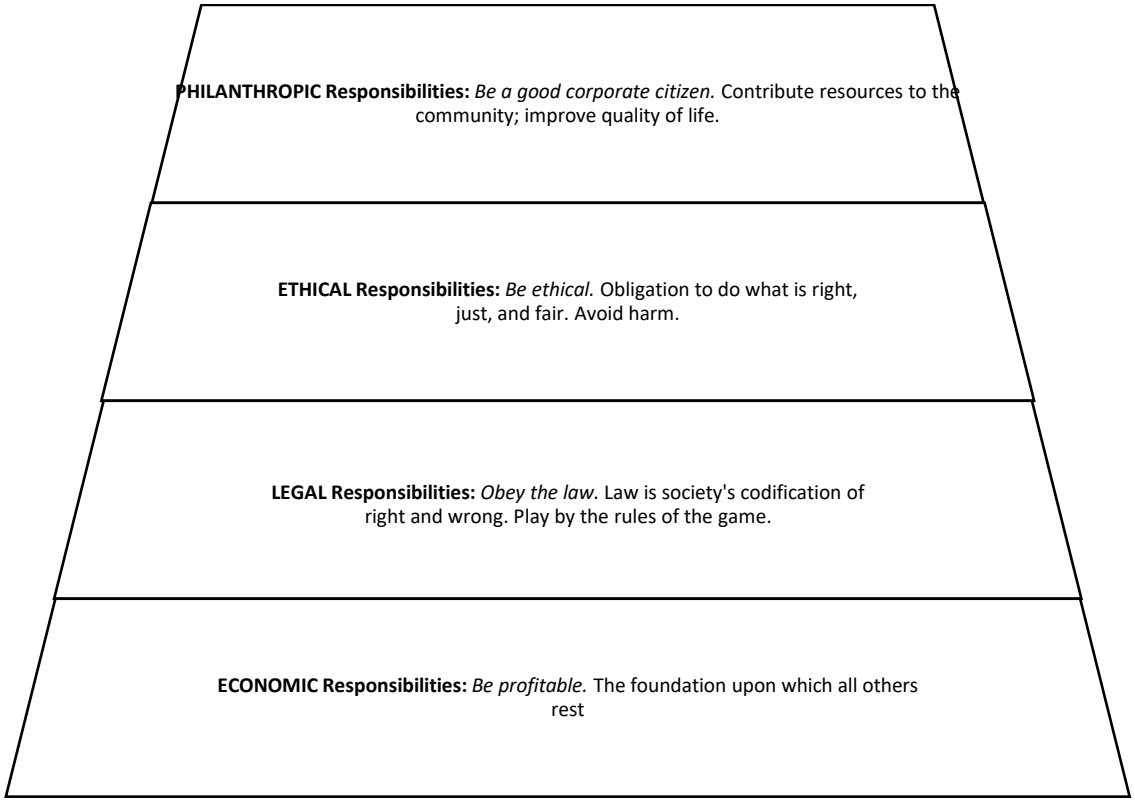

Figure 1. The pyramid of corporate social responsibility (Carroll, 1991).

According to Carroll (1991), the economic dimension of CSR consists mainly of five responsibilities. These include operating towards maximizing the earnings per share, maximizing profitability, maintaining a strong competitive position on the market, high operating efficiency, and being consistently profitable.

The next dimension Carroll (1991) presents is the legal perspective. It covers the view that firms should comply with laws and regulations that comprise their business. The main idea is that a successful company should also be one that undertakes its legal obligations.

Carroll (1991) presents ethical responsibilities as one of the highest blocks of the pyramid. These responsibilities are norms, standards, and expectations that the company's stakeholders consider significant but are not obligated by law. Carroll (1991) points out that even though the ethical responsibilities are a separate block from the legal

perspective, the views and norms of critical stakeholders drive the legal responsibilities dimension.

The top block of the pyramid Carroll (1991) introduces consists of philanthropic responsibilities. This dimension considers actions that encourage the stakeholders to view the company as a good citizen. Carroll (1991) distinguishes that the difference between the ethical and philanthropic dimensions is that if a company decides to exclude philanthropic activities from its operations, it is not judged as unethical.

In a more recent study, Dahlsrud (2008) identifies five key dimensions of CSR. These include the stakeholder, social, economic, voluntariness, and environmental dimensions. He conducts research gathering various definitions of CSR, five dimensions are identified, and frequencies of definitions referring to these dimensions are calculated. When comparing the pyramid introduced by Carroll (1991) and the key components Dahlsrud (2008) identifies, it should be noted that the environmental dimension is not displayed in both definitions. According to Dahlsrud (2008), extensive CSR definitions usually include the environmental perspective.

For example, the European Commission (2011) states that “Corporate social responsibility concerns actions by companies over and above their legal obligations toward society and the environment” (European Commission, 2011, p. 3).

More and more, CSR activities are closely linked to environmental, social, and governance (ESG) dimensions and this information is utilized to compose CSR ratings for companies.

2.2 CSR in Nordic countries

The Nordic countries are relatively similar in culture and government structures. As Fernandez-Perez, Gilbert, Indriawan, and Nguyen (2021) present, the Nordic countries obtain similar values in the individualism index, representing culture. Denmark obtains a

value of 74, Finland 60, Norway 69, and Sweden 71. The average of the sample of 63 countries is 46,3. Strand, Freeman, and Hockerts (2015) summarize the state of Scandinavian CSR and find that the countries and companies score high in corporate social responsibility and sustainability. While focusing on Norway, Sweden, and Denmark, the study finds that a contributor to the high performance in CSR and sustainability is the engagement of stakeholders. Scholtens & Sievänen (2013) note that the Nordic countries' operating environment and government policies are examples for other countries as the Nordics continue to perform well in several international listings related to corporate social performance.

2.3 CSR performance evaluation

The CSR performance of a firm is evaluated according to a criterion that considers the environmental, social, and corporate governance-related aspects. Various rating agencies evaluate firms' CSR ratings, such as Thomson Reuters, MSCI KLD, and Bloomberg. Berg, Koelbel, and Rigobon (2019) state that there are differences in the ESG ratings provided by different agencies. This is mainly due to the methodological differences in composing the ratings. Motivated by Albuquerque et al. (2020) and due to data restrictions, this study uses the Refinitiv (formerly known as Thomas Reuters ASSET4) database to retrieve ESG scores for companies. Therefore, the Refintiv performance evaluation is explained in greater detail. Refinitiv (2020) calculates a total ESG score and an ESGC score, and the latter considers news controversies that may affect the operations of companies. As stated, the ESG score consists of three main pillars. Refintiv (2020) describes the division of these three pillars into ten subgroups in the following way, illustrated in Table 1. These ten subgroups are evaluated, and a sum is computed for the company.

Table 1. ESG criteria based on Refinitiv (2020).

Environmental	Social	Governance
Emission	**Workforce**	**CSR strategy**
Emission	Diversity and inclusion	Shareholder rights
Waste	Career development and training	Takeover defences
Biodiversity	Working conditions	**Management**
Environmental management systems	Health and safety	Structure
Innovation	**Product responsibility**	Compensation
Product innovation	Responsible marketing	**Shareholders**
Green revenues/R&D/capex	Product quality	Shareholder rights
Resource use	Data privacy	Takeover defences
Water	**Community**	
Energy	**Human rights**	
Sustainable packaging		
Environmental supply chain		

Refinitiv (2020) states that the environmental section is divided into three subsections. These three subsections include resource use, emissions, and innovation. These three subgroups are also broken down further. The social pillar in Refinitiv (2020) consists of four aspects. These comprise workforce, human rights, community, and product responsibility. Finally, the governance pillar includes evaluation of management, shareholder aspects, and CSR strategy.

Refinitiv (2020) states that the sum of the weights of the environmental and social categories varies depending on the industry. Governance weights are set constant at the industry level but vary according to country.

Refinitiv (2020) grades companies by giving them a percentile score that is converted to a letter grade from D- to A+. Here “D” indicates the poorest rating a company can obtain in relative ESG performance and implies insufficient reporting and transparency regarding ESG issues. Conversely, “A” grading indicates high ESG performance and transparency in reporting.

2.4 Theories of CSR

There are numerous theories regarding CSR. Garriga and Melé (2004) group several theories in the field of CSR and CFP into four groups. These include instrumental, political, integrative, and ethical theories. Garriga and Melé (2004) identify instrumental theories as a group that conceptualizes CSR as a means to end in achieving profits for the company. Put another way; a social activity should be implemented only if it stimulates profits. On the other hand, the political theories group views companies as agents that have a political responsibility. The third group Garriga and Melé (2004) present, integrative theories, suggests companies should integrate the society's needs into their processes, as businesses depend on the society for their operations to continue. The last group of theories comprehends social responsibility as a responsibility companies should consider without hesitation. These theories see corporate social responsibility as ethically correct and something businesses should consider as ethical commitments.

The instrumental theories present Friedman's (1970) idea of maximizing shareholder value. The theory suggests that the social responsibility of a firm is achieved when profits are made with the resources held within the boundaries of the law and social norms. Friedman (1970) emphasizes that companies should engage and contribute to society, at least if they have an important position in the surrounding environment. Nevertheless, this should only be done if the shareholders gain profits from these actions. For example, Friedman (1970) argues that if a company is an important employer in society, it can attract suitable employees by engaging in activities that contribute positively to the social demands, thus creating shareholder value.

The political theories Garriga and Melé (2004) present include two fundamental theories, the theory of corporate constitutionalism and corporate citizenship. Based on their review Garriga and Melé (2004) state that most approaches relating to corporate citizenship emphasize the responsibilities and partnerships of businesses in society. Garriga and Melé (2004) also present the group of integrative theories. These theories portray the idea that society creates demands that businesses should integrate into their operations.

This is because the business relies on society to maintain its operations. These theories evolve around social demand and how it facilitates wider acceptance and reputation within society.

Fourthly ethical theories are presented. Garriga and Melé (2004) present the stakeholder theory, which is one that is commonly referred to in CSR-related literature. The idea in stakeholder theory is that a business should be interested in its stakeholders. Freeman (1984) conceptualizes the theory as investigating the dimensions of value-creation and trade. Donaldson and Preston (1995) expand the analysis of the stakeholder theory from the descriptive view and find that the theory has a normative base resulting from two features. Firstly, stakeholders are seen as agents who are interested in the activities of the business, whether or not the business is interested in them. Secondly, they state that individuals have value as themselves, not as means to other ends. In Freeman, Harrison, Wicks, Parmar & De Colle (2010), the stakeholder theory presents the view that by addressing and understanding the needs of a business's stakeholders, the business has a better capability for value creation, trade, and managing the business.

Some studies present the belief that engaging in CSR and ESG activities produces a competitive advantage for the company. For example, Kiernan (2001) introduces the idea that superior environmental performance increases the possibility of financial outperformance by contributing to five main drivers of competitive advantage. These five dimensions are shareholder capital, customer capital, innovation capital, cost/risk reduction, and human resource capital. This means that companies can recruit and attract the best employees, gain cost savings by decreasing operating expenses, gain product differentiation, and achieve a competitive advantage by having superior environmental performance. In addition, with their stakeholders, companies can increase their investment attractiveness and gain a superior position in the social license to do business. Furthermore, Albuquerque, Koskinen, and Zhang (2019) present the theory that companies can implement CSR production technologies that differentiate the company's products from rivalries. Moreover, the product differentiation strategy allows the possibility to generate

higher profit margins through a more loyal customer base. In their theory, this lowers the company's systematic risk, meaning companies are less sensitive to aggregate shocks and produce higher firm value. This will create higher profit margins and decrease the sensitivity of prices to aggregate shocks.

Theories relating to CSR also propose that companies that engage in CSR activities perform better in a shock situation. This theory relates to socially responsible investments. The main idea behind the approach is that investors who invest according to the socially responsible investing (SRI) principles do not expect such high margins and profits. Renneboog, Ter Horst, and Zhang (2008) refer to existing studies implying SRI investors approve worse financial performance if companies are investing in CSR activities. Furthermore, Bollen (2007) studies cash inflows and outflows relating to socially responsible mutual funds. The results indicate that cashflows are less sensitive in socially responsible funds compared to conventional mutual funds. Albuquerque, Koskinen, Yang, and Zhang (2020) base an investor theory on these two studies. They present the idea that as socially responsible investors are less sensitive to the performance of socially responsible investments, these investments should perform better in shocks compared to conventional investments.

Furthermore, Nofsinger and Varma (2014) find that socially responsible mutual funds outperform conventional funds in the event of a market crisis. However, their findings show that the same is not true in stable market periods. Therefore, Nofsinger and Varma (2014) argue that ESG investing generates more negligible downside risk in market crisis periods but may display negative abnormal returns over a longer time period.

On the contrary, Barnea and Rubin (2010) point out that CSR can lead to over-investing in CSR activities, resulting in deviations in shareholder value. Furthermore, Barnea and Rubin (2010) propose that agency conflicts resulting from CSR activities may be different from normal agency controversies due to the dimension that employees inside the company may also benefit from CSR activities, not only managers.

2.5 Socially responsible investing

As mentioned in the theory section, the theory driving the existence of firms has previously focused solely on maximizing shareholder value. However, in recent years the focus has shifted so that companies have a more significant responsibility to all stakeholders. The phenomenon of socially responsible investing (SRI) supports the idea of investing in firms that consider environmental, social, and governance-related issues in their operations (Renneboog, Ter Horst & Zhang, 2008). Many studies in the past have focused on examining SRI from the perspective of mutual funds. But Kempf and Osthoff (2007) point out that the fund manager's skills largely impact the performance of mutual funds.

Barnett and Salomon (2006) state that SRI funds implement a practice of screening in choosing the companies to invest in. They define screening based on a definition from the Social Investment Forum. Essentially, screening includes or excludes companies from investment portfolios based on certain social or environmental assessments. There are numerous ways of screening as well.

Kempf and Osthoff (2007) define negative screening as a method where companies doing business in industries commonly seen as controversial are excluded from the investment portfolio. Some controversial industries they mention are alcohol, tobacco, gambling, and nuclear power. Kempf and Osthoff (2007) define positive screening as a strategy where businesses are rated on a set of criteria, and investors choose the highest-rated companies. Possible attributes on which firms are evaluated could include diversity, environment, product, and human rights. Furthermore, the study employs a best-in-class screen. Kempf and Osthoff (2007) state that the strategy is similar to positive screening but makes sure the portfolio is diversified across industries. Resulting in a portfolio that has the highest rated companies in each industry.

3 Corporate financial performance

This section introduces how corporate financial performance is measured. Firstly, valuation is briefly presented. And after this, the concept of risk is gone through. The concepts are relevant to the study as these measures are implemented in the empirical tests later on.

3.1 Valuation

The corporate financial performance of a company generally measures the profitability of a company. As Rodgers, Choy, and Guiral (2013) state, the CFP of firms can be measured in terms of market-based measures and accounting-based measures. They also point out that the previous studies to theirs analyze either one of these. Rodgers et al. (2013) refer to market-based measures as having an investor decision dimension. This is true, as a common market-based measure is Tobin's Q. Tobin's Q considers the company's market valuation. It is calculated as the market value of equity added to the total debt divided by the total assets. The measure, therefore, reflects investor decisions in taking market values into account.

In a relatively old study, Griffin and Mahon (1997) employ five measures for corporate financial performance to assess the relationship between corporate social responsibility and corporate financial performance. The variables included in the study are return on equity, return on assets, total assets, asset age, and 5-year return on sales. The return on equity measure describes the profitability of a company. Return on assets examines how well the assets in a company are utilized in order to make profits. The 5-year return on sales also measures the profitability of a company. Total assets accounts for the size of the company.

In addition, Griffin and Mahon (1997) point out that the variables they choose for the study are justified due to the industry they analyze in their research. This should be noted in all studies, and the corporate financial performance measures should

adequately describe the financial performance of the sample companies. The industry-specific characteristics should be well known to decide on the relevant variables. As an example, Griffin and Mahon (1997) note that the industry examined in their study displays capital intensity. This motivates the choice of variables in their research.

3.2 Risk

Schmidlin (2014) defines risk as a result of the volatility of cash flows, market position, and the financial position of a company. Furthermore, he presents that risk can be measured on a business, stock, and portfolio level. The risk can be evaluated in terms of ratios and valuation. Schmidlin (2014) states that finance literature composes the discount factor using the capital asset pricing model (CAPM) (p. 324). The CAPM measures a company's risk, which is used in valuations of companies. As this study uses stock returns as a proxy for financial performance, volatility is considered an adequate risk measure. Volatility does not evaluate the riskiness of the company that much but rather the riskiness associated with stock prices.

As Hull (2018) states, volatility measures the uncertainty of stock returns. Therefore, if the volatility of high CSR-rated companies is high, there is increased uncertainty about the future direction of the stock returns. Volatility is estimated using historical data. Following the study by Albuquerque et al. (2020), the volatility measure will be formed as the standard deviation of CAPM adjusted daily stock returns over the period examined (p. 597).

Ang, Hodrick, Xing, and Zhang (2009) find that stocks with high idiosyncratic volatility show declining returns. In Albuquerque et al. (2020), the idiosyncratic volatility is measured as the standard deviation of the abnormal returns. The abnormal returns are adjusted to a market model. Ang et al. (2009) provide a variety of options for estimation. Ang et al. (2009) incorporate idiosyncratic volatility measures that are derived using local, regional, and global versions of the Fama-French three-factor model (p. 3). These are alternative options for further studies.

4 The relationship between corporate social responsibility and financial performance

This chapter provides a literature review on the relationship between corporate social responsibility and firm financial performance. Firstly, the chapter goes through studies focusing on the relationship before the COVID-19 pandemic. Secondly, the chapter continues to examine research studying the relationship during the COVID-19 pandemic. Finally, the literature review provides a foundation for deriving the hypotheses for the study, and the hypothesis development is presented in the final part of the chapter.

4.1 Pre COVID-19

Previous literature on the relationship between CSR and firm performance is conflicting. Some studies find a positive relationship (Nofsinger & Varma, 2014; Waddock & Graves, 1997). *S*ome discover a negative relationship and find an insignificant or neutral relationship. Barnett (2007) finds a possible reason for this issue as he creates the stakeholder influence capacity (SIC) measure. SIC refers to the capability of a firm to convince its shareholders and profit from its CSR actions. Firms are said to achieve SIC if they consistently conduct activities to improve their social responsibility. By doing so, shareholders view these firms as more trustworthy and credit them more when conducting future CSR activities, which firms will see as an increase in profits (Barnett, 2007.) Moreover, SIC may be the reason for inconclusive results in CSR-CFP literature. If CSR is measured exclusively by how much a firm invests in CSR activities, the shareholder view is not regarded and can lead to varying results.

Barnett and Salomon (2012) expand the literature on investigating the relationship between CSR and CFP by implementing the SIC theory from Barnett (2007). They use corporate social performance (CSP) instead of CSR to define a broader concept. Barnett and Salomon (2012) define CSP as a term covering the total of the CSR actions a firm has conducted to the date examined. Their sample consists of 1214 firms during the time

interval from 1998 to 2006. Their measures for CFP are return on assets (ROA) and net income. The authors use KLD scores (now known as MSCI ESG rating database) to measure the CSP of firms. Their study finds a U-shaped relationship that is not symmetrical. The firms with the highest KLD scores are found to outperform the firms with the lowest KLD scores in CFP. In addition, the firms with the lowest KLD scores are found to have better financial performance than moderately KLD rated firms, shown in Figure 2. The figure is a visual representation similar to the one in their article but not exactly the same. The authors conclude that CSP is beneficial if the firm is willing to build SIC and views the investments in the long term.

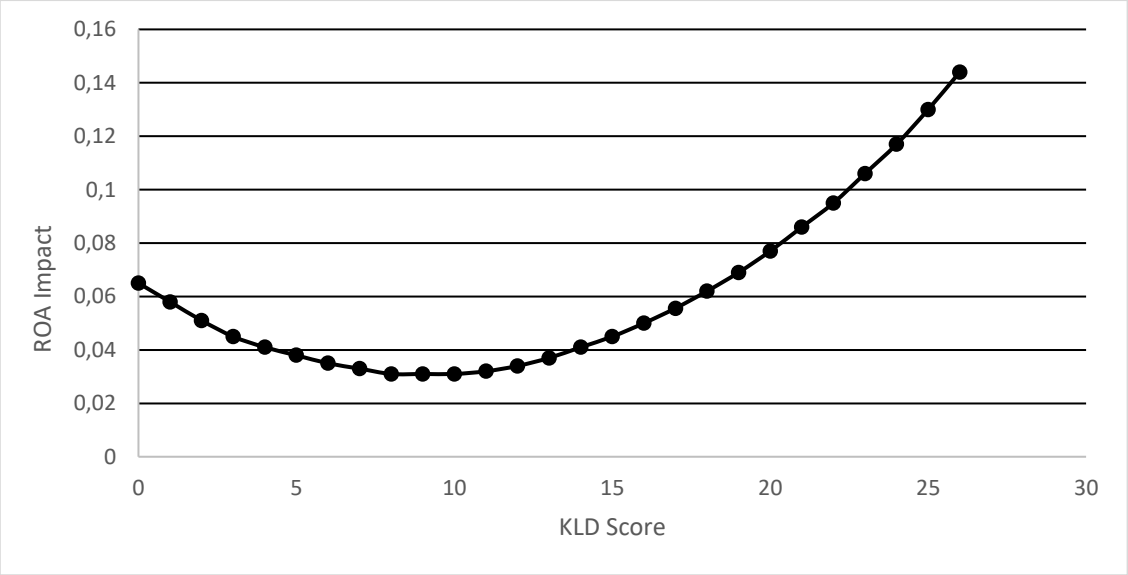

Figure 2. KLD Score & ROA impact from Barnett and Salomon (2012, p.1315).

In examining whether CSR activities can offer insurance-like protection Godfrey, Merrill, and Hansen (2009) find that if companies engage in CSR activities that aim exclusively at the company's shareholders, the activities do not generate the desired insurance effect. Conversely, the opposite is true for CSR activities that aim at creating value for society at large. The study finds these institutional CSR activities to deliver insurance-like benefits. These insurance-like benefits define the ability of CSR activities to preserve corporate social performance rather than to generate it. Of course, as these CSR activities that are not aimed at the company's primary stakeholders provide an insurance-like attribute in negative shocks, it also yields positive consequences for the primary stakeholders.

Lins, Servaes, and Tamayo (2017) investigate the relationship between CSR ratings and firm financial performance in the light of stock returns. The study observes 1673 non-financial firms in the US over the financial crisis period, stretching from August 2008 to March 2009. The authors identify the period as a time when trust declines unexpectedly. Their study finds that firms that have formed trust by means of CSR activities perform better during times of financial crisis. Moreover, their results suggest that the impact of high CSR ratings is of great importance when trust declines unexpectedly, as the difference between stock returns of high and low CSR-rated firms is not observed in the recovery period of their research. Finally, the results conclude that social capital gained by CSR activities provides insurance when trust in the markets is lower or drops unexpectedly as many indicators such as profit margins and sales growth remain higher in firms with high CSR ratings compared to firms with low CSR ratings. In addition to the crisis period, the study also examines the pre-and post-crisis period. During the post-crisis period from April 2009 to December 2013, the study does not find abnormal returns for high-CSR firms as the overall trust has not unexpectedly fallen. Also, the pre-crisis period results indicate that the abnormal returns of high CSR-rated firms are only tied to the financial crisis period.

In their paper, Dyck, Lins, Roth, and Wagner (2019) study the connection between share ownership and firms' environmental and social (E&S) performance. Their research employs a data set of 3277 non-US firms from 41 countries from 2004 to 2013. Using both time series and cross-sectional tests, the study finds that institutional ownership is positively related to firms' environmental and social performance (E&S). Dyck et al. (2019) are motivated by the aforementioned study by Lins et al. (2017) and study the financial crisis period in depth. As a result, Dyck et al. (2019) conclude that institutional ownership of firms is positively related to E&S performance. In addition, the study finds that the European institutional investors have more impact on the E&S performance of firms than institutional investors from other regions, as European countries are seen as ones with high social norms. Furthermore, increasing E&S actions are motivated by both financial

and social returns. In turn, pension funds that strive for investments in E&S can benefit from the financial returns in the future as the funds have long investment horizons.

Albuquerque, Koskinen, and Zhang (2019) investigate whether CSR activities influence the systematic risk and value of a company. The authors create an equilibrium model in which firms can choose between implementing CSR-friendly production or not. The theory presented indicates that CSR production provides products that have a competitive advantage as they have been produced using a certain production method. This will in turn create higher profit margins and decrease the sensitivity of prices to aggregate shocks. The researchers point out that the CSR production method's positive impact on profits depends on the consumers and the ratio of these CSR products to total sales, which is somewhat similar to the SIC implications. Their measure of CSR, the CSR score, consists of 6 different areas of the known CSR framework. The dataset consists of US firms from 2003 to 2015, obtaining 28 578 firm-year observations. The systematic risk of the firms is measured by the estimated betas. The study finds that the systematic risk for firms with higher CSR scores is both economically and significantly lower than for firms with lower CSR scores. Meaning, firms with high CSR scores should be less sensitive to business cycles.

4.2 During COVID-19

As the COVID-19 pandemic portrayed an unprecedented shock that studies refer to as exogenous, the time period and market crash have created a growing strand of academic literature. This section will cover some papers discussing CSR and CFP at this time.

One of the leading motivations for the study is the research conducted by Albuquerque et al. (2020), where they examine the relationship between CSR scores and firm financial performance during the time of an exogeneous shock. The exogenous shock in question is the COVID-19 pandemic and the social distancing measures following the outbreak. The study assesses CSR as a form of resilience against the market crash using cross-sectional and difference-in-difference regressions. The dependent variables that measure

the financial performance of the companies are both market-based and accounting-based. The market-based measures are the abnormal returns and volatility of firms. Accounting-based measures include return on assets, operating profit margins, and asset turnover. The main independent variable of interest is the ES score, which measures the corporate social performance of a company. The ES score is the average of the environmental and social pillar scores for 2018 obtained from the Thomson Reuters' Refinitiv database. The sample consists of 2 171 firms and 134 689 firm-day return data points.

Albuquerque et al. (2020) include firm control variables and industry fixed effects in the cross-sectional regressions. The difference-in-difference regressions include firm and day fixed effects to control for unobservable effects. The time frame of the study is restricted to the first quarter of 2020. The difference-in-difference regressions specify the event dates as the 24th of February to the 18th of March. The 24th of February is also used in the study of Ramelli and Wagner (2020), which is gone through later in this section. The second period covers the time fiscal measures took place. The period stretches from March 18th to March 31st, 2020. The study also includes tests to examine how resiliency is built. Albuquerque et al. (2020) find that the stock returns are higher for firms with high ES scores than firms with lower CSR performance. In addition, the results suggest that the operating profit margins for companies with high ES scores increased at the beginning of 2020. In the study, institutional ownership and high ES performance are found to decrease the volatility of stock price return. Albuquerque et al. (2020) conduct several robustness tests, and in one, companies in essential industries are excluded from the sample. The study classified the financial, telecommunication, and utility sectors as critical.

Ramelli and Wagner (2020) conduct another study of stock price reactions to COVID-19. They state that their main focus is to study the variations in responses inside industries (pp. 624). The study of Ramelli and Wagner (2020) includes a period from January 2, 2020, to March 20, 2020. The timeframe is sectioned into three, with the first period stretching from January 2 to January 17, 2020. The second period is from January 20 to

February 21, and the third period is from February 24 to March 20. Their sample includes the 3 000 most significant companies in the US that are publicly held. The results suggest that companies linked to international trade exhibited inferior performance. Furthermore, the significance of cash holdings is noted in the study.

Bae, El Ghoul, Gong, and Guedhami (2021) also study the relationship between corporate social responsibility and corporate financial performance by examining stock returns. The study examines the pandemic and recovery periods with a sample consisting of 1 750 U.S. firms. The crisis period in their study is similar to Albuquerque et al. (2020), with the crisis period being the 18th of February, 2020, to the 20th of March, 2020. The recovery period is slightly more extended than that of Albuquerque et al. (2020), from the 23rd of March to the 5th of June 2020. Bae et al. (2021) use the MSCI ESG Stats and the Asset4 database for CSR scores. The Refinitiv CSR scores are measured similarly to Albuquerque et al. (2020). Their variable *CSR_Refinitiv* is an average of the Environmental and Social pillar scores. The study uses raw stock returns and market-adjusted returns as measures of returns. In their paper, Bae et al. (2021) do not find an effect of CSR scores on the stock returns during the examined time frame, and the findings hold when reviewing the impact across industries.

Focusing on the environmental dimension of CSR, Garel and Petit-Romec (2021) find that the returns of companies that engage in environmental activities are significantly higher returns during the COVID-19 crisis. Their sample consists of 1626 large U.S. listed firms during the COVID-19 crisis period. The main period examined in their study is from February 20th to March 20th in 2020. The environmental responsibility data for their research is obtained from the Thomson Reuters Asset 4 ESG database. Their study of the buy-and-hold stock returns suggests that companies that engage in environmental responsibility actions achieve higher returns during the COVID-19 crisis.

Another study on the U.S. stock market during the crash caused by COVID-19 is presented by Mazur, Dang, and Vega (2021). The study finds similar results to Ramelli and

Wagner (2020), where the returns of petroleum, entertainment, and real estate experience the most impact during the market crash relating to COVID-19. In addition, the results of Mazur et al. (2021) suggest that the "essential" industries are among the top performers during the market crash. The sample in Mazur et al. (2021) consists of S&P1500 firms during March 2020. The study does not investigate the relationship between CSR and financial performance but rather elaborates on the industries with superior and inferior returns. Their research finds that underperforming stocks demonstrate higher volatility. Furthermore, Mazur et al. (2021) conclude that the weakest performing stocks reduce costs, and on the contrary, some companies increase compensation for the management. The conclusions point out that the salary increases suggest poor corporate governance.

Ding, Levine, Lin & Xie (2021) examine how the rise of COVID-19 cases affected companies. In their study, Ding et al. (2021) analyze the effect of five different corporate characteristics and how the stock returns responded to the rising cases. The five distinct characteristics examined include CSR, the pre-COVID financial position, the ownership structure of a company, the internationality of companies based on global supply chains and customer base, and corporate governance. Their data consists of 6 700 international firms. The study finds that the market drop caused by the pandemic had less effect on companies with strong financial positions going into the pandemic. A strong financial position means that companies have cash, less debt, and higher profits. In addition, the study finds that companies engaged in CSR activities pre COVID-19 were more resilient in the market. Family-owned companies, governments, and large corporates performed better than companies with a greater part of the ownership base consisting of hedge funds. Furthermore, companies with a higher level of internationality through supply chains or customer bases experienced sharper implications due to the market shock.

Qiu, Jiang, Liu, Chen, and Yuan (2021) examine the hospitality industry in further detail from the perspective of corporate social performance. The hospitality industry is found to be one of the most affected industries during the market crash in the study conducted

by Mazur et al. (2021). The study implements event study and difference-in-difference approaches to examine the relation between CSR and the ability to preserve firm value during a rapid stock market decline. Their sample consists of 40 companies operating in the hospitality industry listed on China Stock Exchanges. Of these 40 companies, 28 engaged in CSR activities during the pandemic. This means that companies perform activities that help a variety of stakeholders during the time of the virus. The timeframe for the crisis is specified as starting on the 20th of January 2020 and continuing to the 19th of February. The study finds a positive relationship between engaging in CSR activities and stock returns. Furthermore, news coverage of the responsible activities is found to affect the abnormal returns of stocks positively and significantly. It should be noted that the sample size is relatively modest, but this is expected as the data set includes restrictions through the country and industry specifications.

A study by Demers, Hendrikse, Joos, and Lev (2021) analyzes whether companies with higher CSR levels outperform those with lower CSR scores. Demers et al. (2021) retrieve the ESG scores from the Refinitiv database and use the ESG scores for the year 2018. The sample consists of 1652 US companies eliminating companies from the financial and real estate industries. In their study, the primary period of interest is the first quarter of 2020. In addition, the research analyzes the results of a full-year sample where ten companies are eliminated from the initial selection due to data availability reasons. Demers et al. (2021) provide robust findings that ESG scores do not provide positive explanatory power in stock returns during either period under examination, the first quarter of 2020 or the full year of 2020. However, a significant positive relationship is found between the internally constructed intangible assets and stock returns in both timeframes.

4.3 Hypothesis development

These hypotheses are motivated based on the literature review presented above. This section cover the most essential studies briefly to provide a base for the hypotheses before stating them.

Lins et al. (2017) suggest that the CSR performance of a company is associated with higher stock returns during the financial crisis compared to companies with lowers CSR performance. The great recession of 2008 is examined as a shock to the stock market. The CSR performance of companies is measured using the environmental and social pillars of ESG. Moreover, Albuquerque et al. (2020) find that firms with superior CSR performance, measured by ES scores, exhibit better returns than firms with inferior CSR performance. Motivated by the studies of Lins et al. (2017) and Albuquerque et al. (2020), the first hypothesis of the study is formed as follows:

> *H_1: Firms with high CSR ratings outperform firms with lower CSR ratings in times of pandemics.*

As the literature review suggests, there is a possibility that no significant relationship is found as there are studies for arguments that strengthen the hypothesis *H_1* and weaken the hypothesis.

Albuquerque et al. (2020) find that companies with higher ES scores show lower volatility in returns. A similar result is obtained in the study of Mazur et al. (2021), which finds that the companies with inferior CSR performance display high volatility, which correlates negatively with stock returns. The results from these studies motivate the second hypothesis:

> *H_2: The volatility of firms with high CSR scores is lower than firms with lower CSR scores during pandemics.*

The third hypothesis is motivated by the results Albuquerque et al. (2020) find for the regressions where asset turnover is the dependent variable. In their study, the asset turnover of companies with high ES scores is lower, but operating profit margins are higher than in low ES-rated firms. Therefore, the hypothesis is constructed to reflect the findings in asset turnover:

H_3: The operational performance of companies with high CSR scores is inferior to that of firms with lower CSR ratings in times of pandemics.

5 Data and methodology

This study examines the differences in the financial performance of companies with high CSR scores and low CSR scores during the COVID-19 pandemic. Financial performance is measured by yearly and quarterly abnormal returns in stock market performance. Furthermore, the study examines financial performance from an operational perspective. In addition, a comparison of volatility between the companies with high CSR and low CSR scores is conducted. This section provides a description of the data and methodology used to answer the questions. Firstly, the data collection is introduced. Secondly, the benchmark index and choices for risk-free rates are covered. This is followed by an overview of the variables employed in the study and the descriptive statistics. Finally, the chapter covers the methodology.

5.1 Data

As this thesis focuses on the effect of CSR on firm performance, focusing on Nordic countries with similar characteristics, data is gathered from publicly listed corporations listed on the Helsinki, Stockholm, Oslo, and Copenhagen exchanges. Furthermore, the study concentrates on the time during COVID-19, limiting the timeframe. As the pandemic is still somewhat present in 2022, the timeframe chosen for the study is restricted to the beginning of the pandemic. The restriction is selected to capture the most considerable effect of the exogeneous shock – when companies have not had time to adapt to the situation. Therefore, the stock returns gathered for the study reach from 1.1.2019 to 31.12.2020. The accounting items are collected for the year-end of 2019 and 2020. The data from 2019 is used for constructing control variables and estimating betas.

As in Albuquerque et al. (2020) and Demers et al. (2021), the ES ratings are obtained using data from the Refinitiv Eikon database (formerly Thomson Reuters Eikon and further on referred to as Refinitiv). Following Albuquerque et al. (2020), the environmental (E) and social (S) pillar scores are obtained for 2018. The ES score incorporates a lag of over one year, which enables the examination of the effect of a company's ES score

before the pandemic on the financial performance during the external shock. In the empirical part, the CSR performance of a company is measured using E and social S pillar scores, excluding the Governance (G) pillar. This is done following Albuquerque et al. (2020), Dyck et al. (2019), and Lins et al. (2017). The G pillar is omitted in several studies as it is not considered a part of a company's CSR responsibility. Companies that do not have all pillar scores are omitted from the sample.

In addition, to Refinitiv Eikon Asset 4 ESG scores, Morningstar's Sustainalytics ESG risk ratings are used to measure CSR performance in the robustness tests. According to Sustainalytics (2022), they examine the ESG risks within an industry and review the risk management companies undertake to manage these risks. Therefore, the higher the ESG risk ratings are, the more severe the impact would be on the company. Sustainalytics' ESG risk ratings are used in the robustness tests. The scores are obtained from the website available for the public.

The study includes financial data as measures for operating performance and as control variables. Most financial data is retrieved from the Refinitiv Eikon. The line items *Total Depreciation, Amort. & Depl.,* and *Operating Income after Depreciation and Amortization* for 2019 are retrieved from Orbis. Financial data is collected to construct the measures for operating performance – *return on assets* (*ROA*), *operating profit margin* (*OPM*), and *asset turnover* (*AT*). The control variables include *Tobin's Q*, *Size*, *Cash*, *Leverage*, *return on assets (ROE)*, *selling, general, and administrative expenses (SGA)*, *dividend yield*, and *historical volatility*.

As the study examines a short period, all data points must be obtained for the observations. After controlling for companies that have Refinitiv E and S pillar scores in the year 2018 and have the required accounting data, the sample consists of 194 publicly listed companies from the Nordic exchanges, excluding Iceland. Table 2 summarizes the distribution of observations by industry and country. The sample consists of 32 (16,5 %) Danish firms, 28 (14,4 %) Finnish firms, 29 (14,9 %) Norwegian firms, and 105 (54,1 %)

Swedish firms. Companies in the sample are classified using Industry Classification Benchmark (ICB) industry codes available from the Refinitiv database.

Furthermore, the ICB Industry codes are applied to rank the companies' ES scores into top quartiles within the industry used in the robustness tests. Approximately half of the sample consists of companies listed on the Stockholm exchange, with their market being Sweden. Finally, the data division provides a setting to test whether the restrictive lock-down measures or their lack affected firm performance.

Table 2. Summary statistics of sample based on ICB Industry codes.

Industry (ICB)	Denmark	Finland	Norway	Sweden	Total
10 Technology	3	2		4	9
15 Telecommunications		1	1	5	7
20 Health Care	12	4		13	29
30 Financials				7	7
35 Real Estate		1	2	7	10
40 Consumer Discretionary	2	4	4	25	35
45 Consumer Staples	4	2	4	5	15
50 Industrials	9	9	4	32	54
55 Basic Materials		3	4	7	14
60 Energy	1	1	10		12
65 Utilities	1	1			2
Total	32	28	29	105	194

Examining Table 2, the largest industry in the sample is the Industrials, and most companies are active in the Stockholm exchange. According to FTSE Russell (2021), the industry 50 Industrials includes two supersectors and 48 subsectors.

5.2 Benchmark index and risk-free rates

Abnormal returns are used to measure firm financial performance in the study. Therefore, a benchmark index and risk-free rates are chosen. The benchmark index represents the market return used in the CAPM. The benchmark index selected for the analysis is OMX Nordic 40. Nasdaq (2022) states that the index consists of the 40 most actively traded and significant stocks on Nordic exchanges. The index is revised semiannually.

The OMX Nordic 40 index represents the market as this study focuses on Nordic countries; therefore, the index displays the overall market development and considers the conditions under focus. The selected index includes companies operating in countries with similar cultures and opinions towards CSR issues. Furthermore, the COVID-19 pandemic caused a variety of social distancing measures, and as Gordon et al. (2021) state, these were relatively similar in the Nordic countries, excluding Sweden. Thus, the companies included in the index have been subject to similar restrictive measures to respond to the outbreak.

In the study, the risk-free rate used to estimate the beta is the yield on the 10-year government bonds of each country during the time series. For example, the Swedish companies' Swedish 10-year government bond yield is used as the risk-free rate. The 10-year government bond yields data is gathered from the Bank of Finland (2022) and Sveriges Riksbank (2022) databases.

5.3 Variables

5.3.1 Dependent variables

Following Albuquerque et al. (2020), the daily abnormal returns are calculated using the difference between the daily logarithm of the gross return of a stock and the stock's CAPM beta times the daily logarithm return of the market. These are stated as percentages. The historical data used to estimate the CAPM beta for stocks is from 2019, and the market index used to represent the market return is the OMX Nordic 40. The risk-free rate used for each stock depends on the exchange where the company is listed. For companies listed on the Stockholm exchange, the risk-free rate is the 10-year government bond yield of the Swedish government.

Daily abnormal returns are estimated using the following ordinary least squares regression:

$$AR_{i,t} = R_{i,t} - \beta_{i,t}(R_M - R_{f,c}) \quad (1)$$

$AR_{i,t}$ denotes the abnormal return of a particular stock *i* on trading day *t.* $R_{i,t}$ is the logarithm gross return of stock *i* on trading day *t*. $\beta_{i,t}$ is the estimated beta for stock *i*. The estimation is described above and is obtained using daily stock price data from 2019. R_M denotes the logarithm gross return of the market and $R_{f,c}$ is the risk-free rate. In the equation, subscript *c* stands for the country of the company.

In Albuquerque et al. (2020), one variable for financial performance is the quarterly abnormal return. In this study, both quarterly and yearly abnormal returns are used as performance measures. First, quarterly abnormal returns are analyzed to compare results to previous studies (mainly Albuquerque et al., 2020). Second, yearly abnormal returns are looked into to understand possible deviations for the first year of the pandemic between high CSR and low CSR firms. Quarterly and yearly abnormal returns are calculated using the same formula as daily abnormal returns (equation 1).

Following the methodology of Albuquerque et al. (2020), the volatility of a company's stock is calculated as the volatility of the daily logarithm returns during 2020. The idiosyncratic volatility for a company's stock is measured as the volatility of daily abnormal returns during 2020.

For the dependent variables, *Return on Assets (ROA)* and *Operating profit margin (OPM),* the data for the numerator is retrieved from the Orbis database provided by Bureau van Dijk (access granted by university credentials). Orbis is used due to the data errors that occurred in retrieving data for total depreciation from Refinitiv. The items used to calculate Operating profit before depreciation are *Total Depreciation, Amortization & Depl.* And *Operating Income after Depreciation & Amortization.*

As stated before, one of the measures employed for a company's operating performance is *ROA*. The *ROA* of a company is a variation of the return on investment (ROI) measure (Schmidlin, 2014). Δ*ROA* is calculated following the methodology of Albuquerque et al. (2020) presented in equation (2). In the cross-sectional regressions, this study examines the operating performance by an annual change by comparing the year-end of 2020 to the year-end 2019 values. A limitation of Albuquerque et al. (2020) is that the operating performance is measured by the first quarter of 2020 due to data availability restrictions at the time of the study. Hence, examining the entire year of 2020 enables one to analyze the pandemic's effect on accounting values that are slower to adjust to market developments than stock prices, as Albuquerque et al. (2020) note.

$$\Delta ROA20 = \frac{Operating\ income\ before\ depreciation_{2020-2019}}{Total\ assets_{2020-2019}}\ x\ 100 \qquad (2)$$

The ROA measure is advantageous to the return on equity measure as it does not consider the financial effects. Operating income before depreciation is calculated as the sum of *operating income after depreciation and amortization* and *Total Depreciation, Amortization & Depl. Total assets* is calculated as the difference between total assets at the end of 2020 and 2019.

Following Albuquerque et al. (2020), the operating profit margin (OPM) is used to measure operating performance. As *ΔROA*, *ΔOPM* is calculated as the annual difference comparing the year-end 2020 to 2019, presented in equation (3).

$$\Delta OPM20 = \frac{Operating\ income\ before\ depreciation_{2020-2019}}{Net\ sales_{2020-2019}}\ x\ 100 \qquad (3)$$

The numerator, operating income before depreciation, is calculated similarly to equation (2). The denominator is the difference in a company's net sales or revenues between 2020 and 2019.

The third measure for operating performance is Asset Turnover (AT), as in Albuquerque et al. (2020). The calculation is replicated from their study. As with the other operating performance measures, the variable is calculated as a yearly change. The change is calculated as a difference between the items at the end of 2020 and the end of 2019.

$$\Delta AT20 = \frac{Net\ sales_{2020-2019}}{Total\ assets_{2020-2019}}\ x\ 100 \quad (4)$$

In the difference-in-difference regressions, the dependent variables are daily log returns, daily abnormal returns, and the daily price range. The dependent variable, daily log returns, is the logarithm of daily gross returns. The daily abnormal return is calculated as presented in equation (1). The daily price range is calculated as in Albuquerque et al. (2020), the daily high-low price range during the year 2020 divided by the median of high and low daily prices.

5.3.2 Independent variables

Following both Bae et al. (2021) and Albuquerque et al. (2020), CSR ratings are based on the Environmental and Social scores obtained from Refinitiv. Following Albuquerque et al. (2020), the primary measure for CSR is an average of the E and S pillar scores a company received in 2018. The average is divided by 100 to obtain a percentage. This is denoted by *ES18*. The G pillar is excluded from the primary measure (following Albuquerque et al., 2020; Dyck et al., 2019; Lins et al., 2017). However, the governance pillar score is included in the robustness tests when Sustainalytics ESG risk ratings are used to measure corporate social responsibility.

The thesis investigates the relationship between CSR and CFP with market-based and accounting-based measures. This is done to examine whether CSR firms' performance depends on the investment excitement around CSR firms or whether the balance sheets of highly rated CSR firms are also more adequate to cope with financial pressure.

In the difference-in-difference regressions, the dependent variables examined are the interaction terms $ES18treat * postcovid$ and $ES18treat * recovery$. The $ES18treat$ is a dummy variable that equals one if the company is in the top quartile of ES scores in the whole sample. $postcovid$ is a dummy variable that equals one during the timeframe stretching out from the 24th of February to the 23rd of March. The $recovery$ dummy equals one if the date is the 24th of March or later (until the 31st of December 2020). To understand the specification of event dates, the price development of the benchmark index is presented in Figure 3.

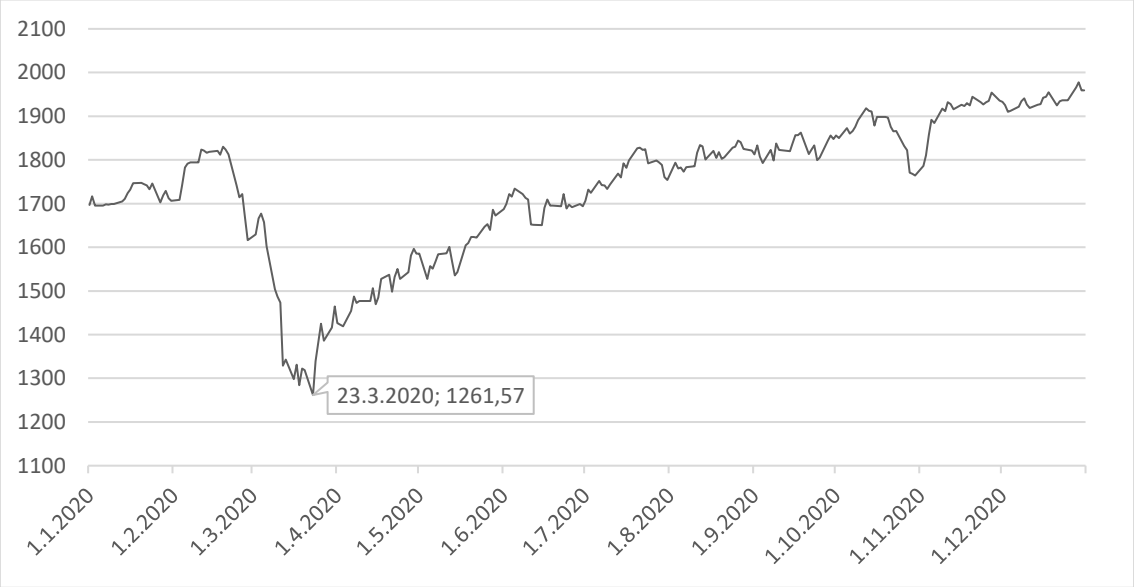

Figure 3. Price development of OMX Nordic 40 index.

The 24th of February is chosen as the starting date of the $postcovid$ period as it was the first trading day after the first lockdowns in Northern Italy. It is the same event date to those used in Albuquerque et al. (2020) and Ramelli & Wagner (2020). Furthermore, on March 18, the European Central Bank (ECB) announced a €750 billion Pandemic

Emergency Purchase Programme to conduct asset purchases until the end of 2020. But as Figure 3 presents, the price of the OMX Nordic 40 index continued declining. Data for Figure 3 is provided from the Refinitiv database. Therefore, the specification to start the $recovery$ period on the 24th of March is due to the change in the price development trend on the specified date. On the 23rd of March, the price development trendline achieves its lowest point during 2020, after which the price starts rising.

5.3.3 Control variables

As firm characteristics may influence stock returns, control variables are included in the regressions. Following Albuquerque et al. (2020), the control variables for firm characteristics are *Tobin's Q* (total assets minus the book value of equity plus the market capitalization and all divided by the total assets), *Size* (Natural log of firm net sales or revenues plus one), *Cash* (cash over total assets), *Leverage* (total debt over total assets), *ROE* (net income divided by the equity), *Selling, General and Administrative expenses (SGA*) (SGA divided by the total assets), *Historical volatility* (calculated as the volatility of daily logarithm returns in 2019) and *Dividend yield.* In Albuquerque et al. (2020), one of the control variables is *Advertising*. Due to data availability reasons, this study replaces the *advertising* control variable with *SGA,* which includes advertising expenses but could not be extracted. Furthermore, the *SGA* item includes marketing and advertising expenses but in addition, it contains, for example, bad debt expense, payroll taxes, and lease expenses. To control for possible outliers, all control variables consisting of accounting numbers are winsorized at 1 % level.

5.4 Descriptive statistics

Table 3 provides a summary of the descriptive statistics regarding the variables used in the main sample and tests. A correlation matrix is provided in Appendix 1.

Table 3. Descriptive statistics.

Variable	Obs.	Mean	St. Dev	25 %	Median	75 %
Yearly abnormal return	194	0,000	0,564	-0,323	0,020	0,313
Quarterly abnormal return	194	-0,176	0,422	-0,396	-0,251	-0,049
ROA20	194	-0,121	8,379	-2,415	0,000	1,711
OPM20	194	3,141	30,515	-1,615	0,154	1,579
AT20	194	-3,456	16,899	-8,196	-2,049	2,569
Volatility	194	0,030	0,013	0,024	0,027	0,032
Idiosyncratic volatility	194	0,146	0,077	0,095	0,101	0,162
ES18	194	0,551	0,219	0,376	0,561	0,748
Sustainalytics	185	22,006	7,214	16,100	21,900	26,700
Tobin's Q	194	0,563	0,178	0,452	0,588	0,683
Size	194	15,107	1,501	14,107	15,051	16,173
Cash	194	0,081	0,079	0,029	0,058	0,106
Leverage	194	0,280	0,161	0,163	0,275	0,389
ROE	194	0,122	0,154	0,060	0,135	0,199
SGA	194	0,193	0,170	0,076	0,151	0,242
Dividend yield	194	2,411	2,106	0,580	2,195	3,810
Historical volatility	194	0,020	0,007	0,015	0,018	0,021
Daily abnormal return	43,456	-0,010	0,354	-0,207	-0,058	0,013
Daily volatility	43,456	1,117	0,758	0,679	0,967	1,371

From Table 3, it can be denoted that even though the daily abnormal return mean for the year is negative, the mean yearly abnormal return is positive. Furthermore, the year was on average unprofitable for companies in the sample as the mean for operating performance variables, which measure the annual change from 2019 to 2020, are negative for two of the measures.

Examining the main independent variable of interest, the *ES18*, the median and mean are about 0,01 apart from each other.

5.5 Regression models

Following Albuquerque et al. (2020) and Lins et al. (2017), a cross-sectional regression model is set up to examine the effect of the shock on financial performance. The cross-sectional regressions are used for both market-based and accounting-based dependent variables for financial performance. These regressions do not consider the monetary

response. Motivated by the studies of Albuquerque et al. (2020) and Lins et al. (2017), the equation (5) is as follows:

$$Performance = \beta_0 + \beta_1 ES18_i + \beta_2 Firmfixed_i + \beta_3 Industryfixed_i + e_o \quad (5)$$

Motivated by Albuquerque et al. (2020), the regression in equation (5) is used to measure abnormal returns (quarterly and yearly), volatility (also idiosyncratic), and operating performance (ΔROA, ΔOPM, and ΔAT). As described before, the independent variable is constructed of the E and S pillar scores. For regressions with abnormal returns or volatility as dependent variables, the control variables include several firm characteristics, *Tobin's* Q, *Size, Cash, Leverage, ROE, SGA, Historical volatility,* and *Dividend yield*. In operating performance regressions, *Tobin's Q, cash*, and *leverage* are the primary measures that are held fixed. In addition, industry fixed effects are added to control for differences resulting from a company being in a specific industry.

In addition, a difference-in-difference panel regression model, as in Albuquerque et al. (2020), is constructed to further model the effect of CSR on stock returns. The event window consists of the initial market shock motivated by Albuquerque et al. (2020) from February 24 to March 23, 2020 (p.602). The recovery period stretches from March 24 to the end of the year 2020. The motivation for the specified event dates is presented in section 5.3.2. Equation (6) displays the regression specification for the difference-in-difference analysis and is motivated by the study of Albuquerque et al. (2020).

$$\begin{aligned} Return = \ & \beta_0 + \beta_1 ES18treat * postcovid + \beta_2 ES18treat * recovery \\ & + \beta_3 Firmfixed_i + \beta_4 Dayfixed_t + e_{it} \end{aligned} \quad (6)$$

The specifications of the variables are presented in section 5.3.

6 Empirical results and discussion

This chapter goes through empirical results and discusses the results as they are presented. First, the regression results for abnormal returns, both quarterly and yearly, are displayed and analyzed. Second, the regression results for volatility are summarized. Finally, the results for operating performance are examined.

6.1 Abnormal returns

Four sets of regressions are run to analyze abnormal returns during times of pandemic. Abnormal returns are used as dependent variables in both cross-sectional and difference-in-difference regressions. In addition, to compare the results with Albuquerque et al. (2020), who study a US sample, regressions incorporate a quarterly abnormal return for the first quarter of 2020. Furthermore, as the full-year returns are accessible at the time of writing this thesis, the yearly abnormal returns are analyzed as well. Table 4 presents the cross-sectional regressions for quarterly abnormal returns for the first quarter of 2020.

Table 4. Cross-sectional regressions for quarterly abnormal returns for the first quarter of 2020.

Variable	(1) Quarterly abnormal return	(2) Quarterly abnormal return	(3) Quarterly abnormal return
ES18	-0.117	-0.272*	-0.336*
	(0.131)	(0.152)	(0.183)
Tobin's Q			-0.254
			(0.177)
Size			0.0143
			(0.0363)
Cash			0.154
			(0.415)
Leverage			-0.164
			(0.276)
ROE			-0.302***
			(0.0990)
SGA			-0.178
			(0.151)
Dividend yield			0.0383**
			(0.0176)
Historical volatility			-2.559
			(6.835)
Observations	194	194	194
R-squared	0.004	0.150	0.220
Industry FE	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Following Albuquerque et al. (2020), Table 4 presents the results obtained from cross-sectional regressions where the dependent variable is the *Quarterly abnormal return* for the companies during the first quarter of 2020. The regressions are estimated on the firm's ES scores without and with industry fixed effects (model (1); model (2) and (3), respectively). Firm control variables are added to model (3). Control variables are winsorized at 1 % levels at each tail, and standard errors are robust to heteroskedasticity. The regression constant is not reported to keep the table concise. Robust standard errors are presented in parentheses.

The results shown in Table 4 suggest that the ES score of companies, contrary to the hypothesis, has a negative effect on the quarterly abnormal returns during the first quarter of 2020. The result is statistically significant at a 10 % level, even after controlling for

all variables. Put another way, an increase in the ES scores of companies is linked to lower stock returns during the beginning of the pandemic, the first quarter of 2020. In addition, the same relationship can be noted when firm control variables are added to the model. The relationship between ES scores and quarterly abnormal returns is negative and statistically significant at a 10 % level. This is the opposite of the findings of Albuquerque et al. (2020). In their study, Albuquerque et al. (2020) find that an increase in ES scores implied higher stock returns during the first quarter of 2020.

Following Albuquerque et al. (2020), Table 5 reports the results obtained from cross-sectional regressions where the dependent variable *Yearly abnormal return* is the abnormal return for firms during 2020. The regressions are estimated on firm's ES scores without and with industry fixed effects (model (1); model (2) and (3), respectively). In addition, firm control variables are added to model 3. As in previous tables, control variables are winsorized at 1 % levels at each tail, and standard errors are robust to heteroscedasticity. Robust standard errors are presented in parentheses.

Table 5. Cross-sectional regressions for yearly abnormal return.

Variable	(1) Yearly abnormal return	(2) Yearly abnormal return	(3) Yearly abnormal return
ES18	-0.0694	-0.134	0.146
	(0.186)	(0.210)	(0.258)
Tobin's Q			0.257
			(0.303)
Size			-0.0683
			(0.0431)
Cash			2.143***
			(0.734)
Leverage			0.226
			(0.350)
ROE			0.0949
			(0.309)
SGA			0.485*
			(0.248)
Dividend yield			0.0110
			(0.0236)
Historical volatility			-14.40
			(9.303)
Observations	194	194	194
R-squared	0.001	0.073	0.172
Industry FE	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The results for the *Yearly abnormal return* suggest no significant effect of ES scores on stock returns on an annual basis. As Albuquerque et al. (2020) do not have access to data for the full-year 2020, the results cannot be compared to their study. But, Demers et al. (2021) provide robust findings that ESG scores do not provide positive explanatory power in stock returns during 2020. The results are in line with their study.

Following both Demers et al. (2021) and Wooldridge (2013), to check for multicollinearity, the variance inflation factor (VIF) test is run for model (3). The obtained VIFs is highest for the controlling variable *size*. When omitting *size* from the model, the regression coefficient for ES does not increase in significance. A table is provided in Appendix 11.

Table 6. Difference-in-differences regressions for daily abnormal return.

Variable	Daily abnormal return
ES18treat*postcovid	-0.135**
	(0.0638)
ES18treat*recovery	-0.0984**
	(0.0432)
Observations	43,456
Number of companies	194
Firm FE	Yes
Day FE	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The difference-in-differences results are presented in Table 6. The regression includes both firm and day fixed effects, and standard errors are clustered by firm. The results show a negative correlation between the abnormal returns and ES scores. The results suggest that firms with high ES rates lose an average 14 % daily return relative to other firms during the initial crisis. The results are significant at a 5 % level. The findings are in line with the results obtained in the cross-sectional regressions presented in Table 4.

6.2 Volatility

The cross-sectional regressions for volatility provide expected results that are significant at a 1 % level, but the difference-in-differences regressions do not obtain statistically significant results.

Table 7 reports results for the cross-sectional regressions where *volatility* and *Idio.volatility* are dependent variables estimated on the ES scores of firms. These are estimated for the whole year. Industry fixed effects are added to models (2), (3), (5), and (6), to control for industry-specific effects. Models (3) and (6) include firm control variables. Due to formatting issues, Dividend yield and Historical volatility are noted as *Div. yield* and *H. volatility,* respectively. Control variables are winsorized at the 1 % level at each tail, and standard errors are robust for heteroscedasticity. The regression constant is not reported to keep the table concise. The robust standard errors are reported in parentheses.

Table 7. Cross-sectional regressions for volatility.

	(1)	(2)	(3)	(4)	(5)	(6)
				Idio.	Idio.	Idio.
Variable	Volatility	Volatility	Volatility	Volatility	Volatility	Volatility
ES18	-0.0114***	-0.0138***	0.00115	-0.0386	-0.0722***	-0.0256
	(0.00308)	(0.00340)	(0.00416)	(0.0254)	(0.0267)	(0.0306)
Tobin's Q			0.000129			-0.0494*
			(0.00366)			(0.0277)
Size			-0.000196			-0.00166
			(0.000808)			(0.00549)
Cash			-0.0161			-0.137**
			(0.0121)			(0.0690)
Leverage			0.0127**			0.0784**
			(0.00497)			(0.0367)
ROE			-0.00996**			-0.0340
			(0.00440)			(0.0293)
SGA			0.00280			-0.00884
			(0.00453)			(0.0274)
Div. yield			-0.000676			0.00793**
			(0.000422)			(0.00330)
H. volatility			0.767***			3.007***
			(0.155)			(0.920)
Obs.	194	194	194	194	194	194
R-squared	0.039	0.345	0.580	0.012	0.326	0.434
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

In Table 7, models (1) and (2), an increase in the ES score of firms seem to decrease the volatility of the stock. This finding is statistically significant at a 1 % level in both models. Quite surprisingly, in the model (3), when firm control variables are added, the link between ES scores and volatility seems to be positive. This would mean that an increase in the ES score would result in higher volatility, but this finding is not statistically significant. Compared to the findings of Albuquerque et al. (2020), the relationship between volatility and ES scores is similar in the US sample, but in their study, ES scores remain to have a negative relationship with volatility and are a significant variable even when firm controls are added to the model.

When idiosyncratic volatility is the model's dependent variable, only the model combining ES scores and industry fixed effects shows statistical significance in the variable of

interest. For example, model (5) suggests that an increase in ES scores decreases the volatility, and this finding is statistically significant. However, when firm controls are added to the model (6), the statistical significance of the ES scores is no longer valid.

Again, to check for multicollinearity, a variance inflation factor (VIF) test is run for models (3) and (6) in Appendix 11 (Demers et al., 2021; Wooldridge, 2013). For both models, the highest VIF obtained is for size (3.48), the second largest for ES18 (2.36). The significance of the independent ES18 variable does not increase significantly when the size variable is omitted from both models (results in Appendix 11).

In the difference-in-difference regressions for volatility, no significant relationship can be concluded from the results. The results are presented in Table 8.

Table 8. Difference-in-differences regression for volatility**.**

Variable	Daily price range
ES18treat*postcovid	0.0592
	(0.0748)
ES18treat*recovery	0.0292
	(0.0331)
Observations	43,456
Number of companies	194
Firm FE	Yes
Day FE	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

6.3 Operating performance

The empirical results of the cross-sectional regressions for operating performance are presented in Table 9. The regressions are quantile regressions that slightly differ from the least absolute deviation regressions Albuquerque et al. (2020) conduct. The operating performance measures are calculated for the full-year 2020. All models include industry fixed effects. Models (1), (3), and (5) include Tobin's Q as the only control variable,

but in models (2), (4), and (6), cash and leverage are added to control. All variables are winsorized at a 1 % level at each tail, and standard errors are robust.

Table 9. Cross-sectional regressions for operating performance.

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	ΔROA20	ΔROA20	ΔOPM20	ΔOPM20	ΔAT20	ΔAT20
ES18	-1.410	-1.245	0.572	0.338	-6.661*	-4.764
	(1.035)	(1.061)	(0.882)	(0.925)	(3.705)	(3.583)
Tobin's Q	1.532	1.840	0.637	0.603	5.504*	-0.647
	(1.612)	(1.453)	(1.062)	(1.149)	(3.302)	(2.408)
Cash		-18.52***		-2.455		-23.44
		(5.556)		(3.803)		(14.20)
Leverage		-2.026		-0.526		10.27***
		(1.482)		(1.239)		(3.861)
Observations	194	194	194	194	194	194
Industry FE	YES	YES	YES	YES	YES	YES
R^2	0.0332	0.0537	0.0290	0.0310	0.0599	0.0904

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Table 9 suggests that companies with high CSR scores have lower asset turnover during the full year of 2020. Other statistically significant findings concerning the main variable of interest are not found. The relationship between ES scores and AT is of the same sign as Albuquerque et al. (2020) find in their study analyzing the first-quarter results of 2020 in a US sample. In their study, Albuquerque et al. (2020) discover a statistically significant positive relationship between ES scores and OPM during the first quarter of 2020. The differences in the results may be a cause of the timeframe differing between the studies.

7 Robustness tests

This section goes through the robustness tests conducted to understand whether the results obtained from the presented empirical tests are robust. The findings in the main sample are tested for different variations of samples. The most significant results are provided within the text, and the rest of the tables are found in the appendices. Firstly, the measure for the CSR performance of a company is switched to the Sustainalytics ESG risk rating. Secondly, the main sample of the Nordic countries is divided into two. One of the subsamples consists of only companies listed on the Stockholm exchange, and the other subsample consists of the other companies on Oslo, Copenhagen, and Helsinki exchanges. The third robustness test excludes the industries that are considered "essential", and the final sample excludes the companies in industries affected the most. The chapter's main objective is to present the findings from the robustness tests, and therefore a summary of the findings concludes the chapter.

7.1 Different ES score

Rating methodologies for calculating ES scores vary amongst agencies. Therefore, the ES scores should be considered by another calculation method. Due to data restrictions, the alternative CSR performance measure used in this study is the Sustainalytics ESG risk rating. The Sustainalytics risk ratings are available to the public and cover most of the companies in the full sample. It should be noted that the Sustainalytics ESG risk rating differs from the E and S pillar scores used in the study. As mentioned in the data section of the study, the higher the risk rating is, the more severe the impact of the risks would be on the company if the risks are realized.

The quarterly abnormal returns for the Sustainalytics sample suggest a positive relationship between the CSR score and the quarterly abnormal returns in the first model, where there are no industry fixed effects or firm control variables. The results are presented in Appendix 3. In a way, the result is similar to the result in the full sample. When the Sustainalytics score increases (CSR performance gets worse), the quarterly abnormal

returns for the first-quarter increase. In the full sample, as the CSR performance improves, the quarterly abnormal returns decrease.

On the contrary, the yearly abnormal returns suggest a negative relationship between Sustainalytics ESG risk ratings and yearly abnormal returns. This result is found in model (3) in Table 10 below, where both industry fixed effects and firm control variables are added. This finding is significant at a 5 % level. The full Nordic sample with ES scores from Refinitiv does not suggest any significant relationships between CSR performance and yearly abnormal returns.

Table 10. Cross-sectional regressions for yearly abnormal return. Using data set including companies with Sustainalytics scores.

Variable	(1) Yearly abnormal return	(2) Yearly abnormal return	(3) Yearly abnormal return
Sustainalytics	-0.00519	-0.00757	-0.0171**
	(0.00665)	(0.00753)	(0.00690)
Tobin's Q			0.136
			(0.298)
Size			-0.0393
			(0.0338)
Cash			1.352*
			(0.764)
Leverage			0.0753
			(0.331)
ROE			-0.280*
			(0.145)
SGA			0.374
			(0.270)
Dividend yield			0.00343
			(0.0236)
Historical volatility			-5.524
			(8.677)
Observations	185	185	185
R-squared	0.005	0.126	0.237
Industry FE	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The results for the cross-sectional regressions for volatility differ slightly from the regression results in the sample with ES scores. The results are provided in Table 11. To summarize, there are significant coefficients in the relationship between Sustainalytics scores and both volatility and idiosyncratic volatility. This is similar to the ES score sample. Alternatively, the coefficients are of different signs, but this would imply a relationship in the same direction. The Sustainalytics score sample suggests that both volatility and idiosyncratic volatility increase when the Sustainalytics score increases (CSR performance deteriorates). In the ES sample, as CSR performance improves, the volatility and idiosyncratic volatility of a stock decrease. Hereby it can be concluded that the results imply a similar relationship between CSR performance and the volatility measures. It should be noted that the results and coefficients in Table 11 are especially small.

Table 11. Robustness tests for volatility using Sustainalytics sample.

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Volatility	Volatility	Volatility	Idio. volatility	Idio. volatility	Idio. volatility
Sustainalytics	0.000148	0.000403***	0.000167*	0.00150*	0.000820	0.000414
	(0.000110)	(0.000101)	(8.61e-05)	(0.000826)	(0.000729)	(0.000742)
Tobin's Q			0.00138			-0.0552*
			(0.00270)			(0.0281)
Size			-9.30e-05			-0.00305
			(0.000466)			(0.00432)
Cash			-0.00672			-0.105*
			(0.00837)			(0.0576)
Leverage			0.0121**			0.0834**
			(0.00466)			(0.0385)
ROE			-0.00127			-0.0291***
			(0.00334)			(0.0104)
SGA			0.00352			-0.00368
			(0.00464)			(0.0267)
Dividend yield			-0.000530			0.00904***
			(0.000397)			(0.00337)
Historical volatility			0.608***			2.649***
			(0.128)			(0.948)
Observations	185	185	185	185	185	185
R-squared	0.010	0.311	0.550	0.020	0.258	0.420
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

7.2 Differences in social distancing

The social distancing measures in Sweden were different from those of the other Nordic countries in the sample Norway, Denmark, and Finland. This is covered in more detail in section 1.1. The effect of the different social distancing regimes is attempted to capture through the division of the set into two subsets. The first subset consists of only

companies listed on the Swedish stock exchange. The second subset consists of companies in the other Nordic countries (referred to as the NODEFI sample, as in Norway, Denmark, and Finland).

The cross-sectional regressions for yearly abnormal returns are conducted for the two subset samples, the one consisting of only Swedish firms and the one consisting of all others from the initial sample (meaning companies on the Oslo, Copenhagen, and Helsinki exchanges). The regressions estimating the yearly abnormal returns on ES scores do not show any significance in the variable of interest in either of the subsets. Therefore, the results are the same as in the main sample. The results are presented in Appendix 4.

Secondly, the cross-sectional regressions of the quarterly abnormal returns for Sweden do not show significance in the ES score. On the other hand, in the NODEFI sample, the quarterly abnormal return regression model, equivalent to the model (2) in Table 4, also shows a significant relationship between the ES score and dependent variable. The coefficient for ES scores is negative and statistically significant at a 5 % level. This indicates similar but stronger results as in the full sample regression. These results are shown in the Table 12 below.

Table 12. Cross-sectional regressions for quarterly abnormal returns for SWE and NODEFI samples.

	(1)	(2)	(3)	(4)	(5)	(6)
	SWE	**SWE**	**SWE**	**NODEFI**	**NODEFI**	**NODEFI**
Variable	Quarterly abnormal return	Quarterly abnormal return	Quarterly abnormal return	Quarterly abnormal return	Quarterly abnormal return	Quarterly abnormal return
ES18	0.00600	0.0640	-0.171	-0.326	-0.599**	-0.509
	(0.0987)	(0.120)	(0.139)	(0.254)	(0.281)	(0.339)
Tobin's Q			-0.130			-0.237
			(0.140)			(0.354)
Size			0.0310			-0.0637
			(0.0208)			(0.0760)
Cash			0.188			-0.332
			(0.395)			(0.672)
Leverage			-0.553**			-0.230
			(0.222)			(0.456)
ROE			0.483**			-0.00784***
			(0.197)			(0.00233)
SGA			0.168			-0.556**
			(0.175)			(0.270)
Dividend yield			-0.0101			0.0440**
			(0.0133)			(0.0204)
Historical volatility			-5.355			-10.65
			(6.466)			(10.10)
Observations	105	105	105	89	89	89
R-squared	0.000	0.226	0.441	0.018	0.236	0.342
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

In cross-sectional regressions for volatility, both subsets suggest highly significant coefficients for ES scores in the first two models where firm control variables are excluded. The results are shown in Table 13 for the Swedish sample and 14 for the NODEFI sample. In both samples, ES score coefficients are negative and significant at 1 %. R^2 is 0,002

higher in the Swedish sample for the first model but 0,076 higher in the NODEFI sample for the second model, which includes industry fixed effects. When firm control variables are included in the models, the coefficients for ES scores are no longer significant. Both subsets confirm the robustness of the results obtained in the complete sample regressions for volatility.

Table 13. Cross-sectional regressions for volatility for Swedish sample.

SWE	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Volatility	Volatility	Volatility	Idio. volatility	Idio. volatility	Idio. volatility
ES18	-0.007***	-0.008***	0.003	-0.002	-0.003*	0.002
	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)
Tobin's Q			0.008**			0.003
			(0.004)			(0.002)
Size			-0.001			-0.000
			(0.001)			(0.000)
Cash			0.0119			0.005
			(0.009)			(0.004)
Leverage			0.0152**			0.010**
			(0.007)			(0.004)
ROE			-0.012**			-0.006**
			(0.005)			(0.003)
SGA			-0.007			-0.003
			(0.004)			(0.002)
Dividend yield			-0.000			-8.56e-05
			(0.000)			(0.000)
Historical volatility			0.457***			0.212**
			(0.170)			(0.093)
Observations	105	105	105	105	105	105
R-squared	0.050	0.322	0.595	0.012	0.261	0.507
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

When idiosyncratic volatility is the dependent variable of the regressions, there are deviations in the results of the subsets. The results are presented in Tables 13 and 14. The solely Swedish sample suggests a significant negative correlation between ES score and the dependent variable at a 10 % level only for model (5) in the table. The model

regresses idiosyncratic volatility on ES scores and includes industry fixed effects. In the NODEFI sample, coefficients for ES scores are negative and significant for two of the models. The coefficients are significant at a 1 % level before adding firm control variables to the model. The findings in the robustness tests suggest that the findings in the full sample regressions are subject to some country deviations. Further examination is needed to limit the deviation to being caused by just the social distancing measures, but it is plausible it has an effect.

Table 14. Cross-sectional regressions for volatility for NODEFI sample.

NODEFI	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Volatility	Volatility	Volatility	Idio. volatility	Idio. volatility	Idio. volatility
ES18	-0.018***	-0.019***	0.001	-0.104***	-0.135***	-0.069
	(0.006)	(0.006)	(0.008)	(0.038)	(0.037)	(0.043)
Tobin's Q			-0.011			-0.073*
			(0.008)			(0.041)
Size			-0.000			-0.011
			(0.002)			(0.008)
Cash			-0.0214			-0.163**
			(0.021)			(0.079)
Leverage			0.017*			0.075
			(0.010)			(0.053)
ROE			-8.65e-05			-0.000
			(6.25e-05)			(0.000)
SGA			0.012			-0.016
			(0.009)			(0.038)
Dividend yield			-0.001			0.008***
			(0.001)			(0.003)
Historical volatility			0.768***			0.788
			(0.262)			(0.938)
Observati-ons	89	89	89	89	89	89
R-squared	0.048	0.398	0.603	0.074	0.487	0.589
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Finally, the cross-sectional regressions for operating performance are run for the sample consisting of Swedish companies and the sample composed of Nordic countries, excluding Sweden. The findings for the Swedish sample are presented in Table 15 and for the NODEFI sample in Appendix 5. As before, there are differences in the Swedish sample compared to the NODEFI sample. In the Swedish sample, one of the ROA models and one of the AT models show a negative and significant coefficient for ES scores. The results from the Swedish sample differ from the results obtained from the full sample. The full sample suggests a negative and significant coefficient in ES scores when analyzing AT, and cash nor leverage are included in the model. The results from the Swedish samples do not suggest such findings. The coefficient for ES scores is negative and statistically significant when cash and leverage are added as control variables to the model. The Swedish sample suggests a negative correlation between ES scores and two operational performance measures.

Table 15. Cross-sectional regressions for operating performance in the Swedish sample.

SWE	(1)	(2)	(3)	(4)	(5)	(6)
Variable	ΔROA20	ΔROA20	ΔOPM20	ΔOPM20	ΔAT20	ΔAT20
ES18	-0.891	-1.990*	0.139	0.224	-6.747	-10.04**
	(1.287)	(1.073)	(1.069)	(1.512)	(4.438)	(4.429)
Tobin's Q	2.235	2.693**	0.197	0.328	5.270***	3.975
	(1.493)	(1.168)	(1.471)	(2.125)	(1.892)	(3.121)
Cash		-13.79**		-2.687		-30.93*
		(5.583)		(5.374)		(16.45)
Leverage		-2.305		-0.907		5.688*
		(1.505)		(2.217)		(2.943)
Observations	105	105	105	105	105	105
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0,0648	0,0913	0,0574	0,0603	0,1008	0,1301

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The cross-sectional regressions on operating performance in the NODEFI sample do not suggest any significance for ES scores in predicting operational performance. This is quite surprising, as neither subset provides the same findings as the full sample regressions.

In all samples, in regressions for OPM, the ES scores obtain positive coefficients, but these are not statistically significant. The results are presented in Appendix 5.

7.3 Industries considered essential

During the COVID-19 pandemic, some businesses were kept open, whereas some were forced to close their services from the public. The industries that were considered essential kept operating, and the results of these companies may deviate from the actual impact the pandemic had on performance. Investors may have bought stocks of the essential companies increasing the stock prices. Furthermore, the accounting numbers may have benefitted from a situation where consumers had some limitations on consumption. Albuquerque et al. (2020) recognize the telecommunications, utilities, and financial industries as essential industries in their sample. Mazur et al. (2021) also find that the aforementioned industries are some of the industries that exhibit superior performance during the COVID-19 crisis. Following these studies, the same industries are excluded from the Nordic sample in this study. The yearly abnormal returns provide the same results as the full sample. There is no significant relationship between the ES scores and yearly abnormal returns for 2020.

The sample excluding the telecommunications, utilities, and financials industries provides similar results to the full sample when assessing the cross-sectional regressions for volatility. In both samples, the models (1) and (2) for volatility (which do not include firm control variables), the ES score has a negative coefficient and is significant at a 1 % level. In addition, the sample excluding “critical” industries provides results that suggest more robust implications for ES scores having a negative relationship with idiosyncratic volatility. The models corresponding to models (4) and (5) in Table 7 suggest a negative coefficient for ES scores and significant at 10 % and 1 % levels. Results in Table 16.

Table 16. Cross-sectional regressions for volatility and idiosyncratic volatility. The dataset excludes Telecommunications (15), Financials (30), and Utilities (65) industries.

Variable	(1) Volatility	(2) Volatility	(3) Volatility	(4) Idio. volatility	(5) Idio. volatility	(6) Idio. volatility
ES18	-0.0113***	-0.0140***	0.00176	-0.0485*	-0.0719***	-0.0278
	(0.00329)	(0.00343)	(0.00415)	(0.0272)	(0.0268)	(0.0306)
Tobin's Q			-0.00125			-0.0740**
			(0.00433)			(0.0365)
Size			-0.000588			-0.00176
			(0.000869)			(0.00617)
Cash			-0.0115			-0.120**
			(0.0102)			(0.0574)
Leverage			0.0140**			0.0803**
			(0.00580)			(0.0406)
ROE			-0.000527			-0.0359***
			(0.00374)			(0.00986)
SGA			0.00269			-0.00698
			(0.00452)			(0.0256)
Dividend yield			-0.000698			0.00869**
			(0.000454)			(0.00345)
Historical volatility			0.718***			2.162**
			(0.157)			(0.879)
Observations	178	178	178	178	178	178
R-squared	0.037	0.343	0.554	0.018	0.326	0.459
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The regression results regarding the operational performance suggest similar findings as in the full sample (see Appendix 8). When excluding the telecommunications, utilities, and financial industries from the sample, the only ES score coefficient that is statistically significant is in the corresponding model as in Table 9. The statistical significance is also at a 10 % level as in the full sample regressions. This strengthens the findings that an increase in the ES scores results in a decrease in asset turnover during 2020, considering the first year of the pandemic.

7.4 Industries affected the most

In their study, Ramelli and Wagner (2020) state that the energy, real estate, and consumer services industries suffered particularly during the whole period from January 2nd, 2020, to March 20th, 2020. Similar results are found in Mazur et al. (2021). The energy sector was also affected by the energy price fluctuations. As these industries have been most affected during the beginning of 2020, the robustness tests are run excluding these industries. After excluding the companies with energy, real estate, or consumer discretionary industry codes, the sample consists of 137 companies.

The results corresponding to Tables 4 and 5 provide slightly different outcomes. In the sample excluding energy, real estate, and consumer services industries, the quarterly abnormal returns for the first quarter of 2020 do not suggest significant coefficients for ES scores. As Albuquerque et al. (2020) mention, this may be explained by energy companies traditionally scoring lower CSR ratings (p. 598).

The results are similar to the full sample in the cross-sectional regressions for volatility and idiosyncratic volatility. The results are presented in Table 17 below. For models (1), (2), and (5), corresponding to the same models in Table 7, the coefficients for ES scores are negative and significant. In addition, the coefficient for ES scores in idiosyncratic volatility regressions is significant at a 10 % level, whereas it is significant at a 1 % level in the full sample. Therefore, the findings in the full sample can be confirmed to be strengthened.

Table 17. Cross-sectional regressions for volatility and idiosyncratic volatility. The sample excludes Real Estate (35), Consumer Discretionary (40), and Energy (60) industries.

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Volatility	Volatility	Volatility	Idio. volatility	Idio. volatility	Idio. volatility
ES18	-0.00989***	-0.0126***	0.00213	-0.0213	-0.0613*	-0.0305
	(0.00271)	(0.00359)	(0.00332)	(0.0267)	(0.0336)	(0.0379)
Tobin's Q			0.00357			-0.0395
			(0.00281)			(0.0304)
Size			-0.00100*			-0.000435
			(0.000560)			(0.00610)
Cash			0.00329			-0.0750
			(0.00561)			(0.0723)
Leverage			0.00818**			0.0474
			(0.00379)			(0.0447)
ROE			-0.00587			-0.0120
			(0.00356)			(0.0434)
SGA			0.00100			-0.00979
			(0.00307)			(0.0312)
Dividend yield			8.40e-05			0.00627
			(0.000188)			(0.00390)
Historical volatility			0.605***			2.764**
			(0.122)			(1.290)
Observations	137	137	137	137	137	137
R-squared	0.095	0.285	0.689	0.005	0.143	0.222
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The results in Table 18 for regressions regarding operating performance imply an even more significant relation between ES scores and AT. In the sample where energy, real estate, and consumer discretionary industries are excluded, the coefficient for ES scores is more negative and significant at a 1% level. In the full sample regressions, the same coefficient is negative but significant at a 10 % level. This result strengthens the rather surprising suggestion that ES scores had a negative effect on asset turnover during the first year of the COVID-19 pandemic.

Table 18. Cross-sectional regressions for operational performance. The sample excludes Real Estate (35), Consumer Discretionary (40), and Energy (60) industries.

Variable	(1) ΔROA20	(2) ΔROA20	(3) ΔOPM20	(4) ΔOPM20	(5) ΔAT20	(6) ΔAT20
ES18	-1.857	-1.354	-0.235	-0.118	-11.57***	-1.296
	(1.310)	(1.263)	(0.850)	(1.513)	(3.549)	(3.256)
Tobin's Q	1.353	1.517	0.375	0.574	1.261	-6.504*
	(1.793)	(1.647)	(1.112)	(1.643)	(1.468)	(3.355)
Cash		-10.94**		-0.901		-2.737
		(4.882)		(9.399)		(19.14)
Leverage		-0.629		-0.271		20.65***
		(1.846)		(1.452)		(3.518)
Observations	137	137	137	137	137	137
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.0481	0.0722	0.0165	0.0168	0.0767	0.1115

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

7.5 Different time and ES scores

The difference-in-differences regressions are also conducted once more. The tables with the results can be found in Tables 19 and 20. Table 19 presents the difference-in-differences regressions with a different period specification. The regressions include the timeframe from October 19 to November 10, 2020, since this is the next market dip seen in the OMX Nordic 40 index price development (see Figure 3). The shock period lasts from October 19-October 30, and the recovery2 is from November 2 to November 10, 2020. The results suggest that the volatility increases in high ES rated firms relative to others in the recovery2 period. Such a finding is not suggested in the main tests.

Table 19. Difference-in-difference regressions with a different time period.

Variable	(1) Daily abnormal return	(2) Daily price range
ES18treat*covid2	-0.0147	-0.0811
	(0.0148)	(0.0560)
ES18treat*recovery2	-0.0237	0.223**
	(0.0187)	(0.0866)
Observations	43,456	43,456
Firm FE	Yes	Yes
Day FE	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

The difference-in-difference regressions are also run with a different ES treatment dummy. In the robustness tests, the ES treatment dummy receives a value of 1 if the company holds a high ES score within its industry. In the main sample, the ES treatment is one of the ES score of a company is considered high within the full sample. The results suggest a similar relation to the main sample but are slightly less significant (see Table 20).

Table 20. Difference-in-difference regressions with different treatment dummy.

Variable	(1) Daily abnormal return	(2) Daily price range
ES18treatown*postcovid	-0.128*	-0.0399
	(0.0664)	(0.0763)
ES18treatown*recovery	-0.106**	0.0222
	(0.0452)	(0.0349)
Observations	43,456	43,456
Number of companies	194	194
Firm FE	Yes	Yes
Day FE	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

To summarize the results from the robustness tests, the additional tests conducted to test the robustness of the results obtained for abnormal returns find that the results in the full sample are robust. When conducting the tests with subsets divided by social distancing measures, the results are similar to the findings in the main sample. In addition, the regression run with Sustainalytics ESG risk ratings implies similar results to the full sample.

The robustness tests conclude that the results obtained from the main sample can be verified. The Sustainalytics sample suggests volatility increases as the CSR performance of companies deteriorates. This, in turn, implies that improvement in CSR performance decreases volatility. Comparing the Swedish sample and the NODEFI sample, the results are in line with each other and with the main sample. The sample, which excludes companies in “critical” industries, provides similar results to the main sample. Furthermore, the results are highly significant. Lastly, the sample that excludes the companies in industries that were affected the most (energy, real estate, and consumer discretionary), the suggested results confirm the results of the full sample.

After conducting the robustness tests for operational performance, the result obtained from the full sample can be approved. The Sweden and NODEFI samples provide similar results to the full sample. The results are highly significant in the sample where the companies in the energy, real estate, or consumer discretionary industries are excluded. The ES scores have a negative relationship with AT, and this finding is significant at a 1 % level. It should be noted that the only operating performance measure with which the CSR performance measure has a relationship of statistical significance is the AT measure.

8 Conclusions, limitations, and suggestions for further research

This chapter concludes the thesis. Firstly, the chapter goes through the findings of the study and the implications of the results. This is followed by a discussion of the limitations the empirical part of the study has. Finally, the chapter elaborates on possibilities for future research.

8.1 Summary and implications

The questions presented at the beginning of the thesis regarding whether CSR activities generate superior performance, higher stock valuations, and smaller risk should be answered. The study suggests that returns for companies with high CSR ratings are not superior to those with lower CSR scores. The abnormal return regressions suggest the opposite. When ES ratings increase, the abnormal quarterly returns during the first quarter of 2020 are found to experience a negative effect in the Nordic sample. The yearly abnormal returns do not provide results of statistical significance.

When comparing the Swedish and other Nordics samples, the Swedish sample does not provide results of statistical significance when analyzing the relationship between CSR and abnormal returns. However, the countries that implemented social distancing procedures are found to experience a similar effect to the findings in the full sample. The quarterly abnormal returns are negatively correlated with ES scores. Speculation could be that the lockdown measures affected the firms with higher ES scores more, but this would require an in-depth analysis of the industries in which the top performers regarding CSR performance are. In the main sample of the study, most top performers in CSR scores are in the industry 50, Industrials, which could be thought to have been impacted significantly during the time of the pandemic. This is due to the Industrials industry consisting of a variety of subsectors. Moreover, Industrials may have more globally interdependent supply chains and customer bases, which would have been affected in the

pandemic due to travel restrictions and factory closings, but this should be examined in more depth. Furthermore, the companies within the industry may require on-site work instead of remote work, which would have been highly affected in the countries that imposed social distancing procedures.

On the subject of operating performance, the regression results in the study do not suggest numerous significant results. The only correlation between ES scores and asset turnover is found to be significant at a 10 % level, but the link is negative. Operating profit margins and CSR performance seem to have a positive relationship, but the results are not statistically significant. Based on the one model in the full sample and the robustness tests, the study would conclude a negative relationship between CSR and operational performance. A reason for this could be that companies are willing to contribute to CSR-related initiatives at the cost of operating performance, but this is highly speculative and would require a separate investigation to be concluded.

In the second research question, on the relationship between volatility and CSR performance, the study finds a significant and negative correlation between the two. The results are robust. In addition, the results are the same in both the Swedish sample and the sample consisting of the other Nordic countries. Therefore, no conclusion on the effect of social-distancing procedures can be deducted from these results.

8.2 Limitations

One of the limitations of the study relates to the pandemic time period. Currently, the pandemic period is still upon us, and the full extent of the consequences resulting from the virus are unknown. At this time, uncertainty remains on whether restrictions and social distancing measures are placed and are the vaccines effective enough to end the pandemic. This results in the problem that the whole pandemic period is not examined. The data section discusses the dates that are reviewed in the study.

Due to data restrictions, the commonly used MSCI scores could not be examined in the study. This issue was overcome by analyzing the Sustainalytics ESG Risk ratings, and these ratings are slightly different from the ratings retrieved from Refinitiv. A possibility to strengthen the research would be to conduct the study with more commonly utilized CSR scores. Moreover, the sample size is relatively small compared to studies conducted in the U.S. This is due to the number of companies listed on stock exchanges and the restriction of companies having CSR scores that could be obtained from the Refinitiv database for the year 2018. Therefore, a possibility would be to analyze a European sample to expand the sample size.

A shortcoming of the study is that the empirical tests do not control for the effect of possible subsidies provided to companies by different institutions in response to the pandemic. The regressions include industry fixed effects, but there may be some exceptions within an industry. Moreover, the regressions include control variables for cash and leverage, but the subsidies may have been granted in other forms. All the control variables are estimated using one year of historical data. The data for the control variables could be longer. In addition, the stock betas are calculated using one year. Events during the time frame may affect the value obtained for beta, and therefore extreme events or outlier values would be slightly more mitigated in a longer historical period.

Another limitation of the study is that a possibility of omitted variable bias exists in the study. The methodology does not extensively consider the case of an omitted variable. For example, the study does not consider the international characteristics of companies. As Ding et al. (2021) find, the global links of companies affected their performance during the time of the market crash. As governments implemented social distancing procedures and restricted travel, firms with globally linked supply chains and international customers experienced an impact. In addition, Ding et al. (2021) find that the ownership structure affects the performance of companies. Institutional ownership is also examined in Albuquerque et al. (2020), but this study does not consider the ownership structure of firms.

Furthermore, a limitation of the study is that the sample does not include privately held companies. The ownership structures of companies are found to have an impact on the financial performance of companies during the time of the COVID-19 pandemic. Thus, excluding these characteristics from the sample might deviate from the robustness of the results.

8.3 Suggestions for further research

A possibility for further research would be to fully identify the cause of the differing results in the Swedish and NODEFI samples, seen in the robustness tests. A plausible reason could be the different approaches taken in restricting the economy and policies for social distancing. The conclusions cannot be drawn from the tests run in this study, as there is not enough data, and other explanations are possible. For example, the rates of rising cases or the number of patients in the countries could be examined. As the pandemic is still somewhat a current topic, it might be relevant to conduct the study after the pandemic is announced to be over.

As Nordic firms are generally high performers in the CSR context, a possibility for further research would be to conduct the research in a fully international sample. Most of the studies found for the literature review covered the firms in a specific market, but a limited amount, if any, compared different markets. If a global sample is constructed, the effects of the decisions the country makes regarding social distancing should be controlled. This approach would also increase the sample size, which is relatively small in this study.

References

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Management Science, 65*(10), 4451-4469. https://doi.org/10.1287/mnsc.2018.3043

Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of Environmental and Social Stocks: An analysis of the Exogenous COVID-19 Market Crash. *The Review of Corporate Finance Studies, 9*(3), 593-621. https://doi.org/10.1093/rcfs/cfaa011

Ang, A., Hodrick, R. J., Xing, Y., & Zhang, X. (2009). High idiosyncratic volatility and low returns: International and further U.S. evidence. *Journal of Financial Economics*, *91*(1), 1-23. https://doi.org/10.1016/j.jfineco.2007.12.005

Bae, K., El Ghoul, S., Gong, Z., & Guedhami, O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance, 67,* 101876. https://doi.org/10.1016/j.jcorpfin.2020.101876

Bank of Finland. (2022). *Yields on Finnish benchmark government bonds* [Data set]. Bank of Finland. https://www.suomenpankki.fi/en/Statistics/interest-rates/tables/korot_taulukot/viitelainojen_korot_en/

Barnea, A., & Rubin, A. (2010). Corporate Social Responsibility as a Conflict Between Shareholders. *Journal of Business Ethics, 97*(1), pp. 71-86. https://doi.org/10.1007/s10551-010-0496-z

Barnett, M. L. (2007). Stakeholder Influence Capacity and the Variability of Financial Returns to Corporate Social Responsibility. *The Academy of Management Review, 32*(3), 794-816. https://doi.org/10.5465/AMR.2007.25275520

Barnett, M. L., & Salomon, R. M. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal, 27*(11), 1101-1122. https://doi.org/10.1002/smj.557

Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic Management Journal, 33*(11), 1304-1320. https://doi.org/10.1002/smj.1980

Berg, F., Koelbel, J. F., & Rigobon, R. (2019). *Aggregate confusion: The divergence of ESG ratings* (pp. 1-42). Cambridge, MA, USA: MIT Sloan School of Management. https://dx.doi.org/10.2139/ssrn.3438533

Bollen, N. P. (2007). Mutual fund attributes and investor behavior. *Journal of Financial and Quantitative Analysis*, *42*(3), 683-708. https://doi.org/10.1017/S0022109000004142

Bowen, H. R., Gond, J. & Bowen, P. G. (2013). *Social Responsibilities of the Businessman.* https://ebookcentral-proquest-com.proxy.uwasa.fi/lib/tritonia-ebooks/detail.action?docID=1650798.

Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons, 34*(4), 39-48. https://doi.org/10.1016/0007-6813(91)90005-G

Dahlsrud, A. (2008). How corporate social responsibility is defined: An analysis of 37 definitions. *Corporate Social Responsibility and Environmental Management, 15*(1), 1-13. https://doi.org/10.1002/csr.132

Demers, E., Hendrikse, J., Joos, P., & Lev, B. (2021). ESG did not immunize stocks during the COVID-19 crisis, but investments in tangible assets did. *Journal of Business Finance and Accounting*, *48*(3-4), 433-462. https://doi.org/10.1111/jbfa.12523

Ding, W., Levine, R., Lin, C., & Xie, W. (2021). Corporate immunity to the COVID-19 pandemic. *Journal of Financial Economics 141*(2), 802-830. https://doi.org/10.1016/j.jfineco.2021.03.005

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *The Academy of Management Review, 20*(1),65-91. https://doi.org/10.5465/AMR.1995.9503271992

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics, 131*(3), 693-714. https://doi.org/10.1016/j.jfineco.2018.08.013

European Commission. (2011). *Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions: A renewed EU strategy 2011-2014 for Corporate Social Responsibility* [online]. [cited 13.12.2020]. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0681&from=EN

Fernandez-Perez, A., Gilbert, A., Indriawan, I., & Nguyen, N. H. (2021). COVID-19 pandemic and stock market response: A culture effect. *Journal of Behavioral and Experimental Finance*, *29*, 100454. https://doi.org/10.1016/j.jbef.2020.100454

Freeman, R. E. (1984). *Strategic management: A stakeholder approach.* Boston. Pitman.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & De Colle, S. (2010). Stakeholder theory: The state of the art. Cambridge University Press.

Friedman, M. (1970, September 13). The Social Responsibility of Business is to Increase its Profits. *New York Times Magazine*, 122-126.

FTSE Russell. (2021, June). *Industry Classification Benchmark (Equity) v3.8.* https://research.ftserussell.com/products/downloads/ICB_Rules_new.pdf

Garel, A., & Petit-Romec, A. (2021). Investor rewards to environmental responsibility: Evidence from the COVID-19 crisis. *Journal of Corporate Finance*, *68*, 101948. https://doi.org/10.1016/j.jcorpfin.2021.101948

Garriga, E., & Melé, D. (2004). Corporate Social Responsibility Theories: Mapping the Territory. *Journal of Business Ethics, 53*(1), 51-71. doi:10.1023/B:BUSI.0000039399.90587.34

Global Sustainable Investment Alliance. (2018). *Global sustainable investment review.* Global Sustainable Investment Alliance. http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal, 30*(4), 425-445. https://doi.org/10.1002/smj.750

Gordon, D. V., Grafton, R. Q., & Steinshamn, S. I. (2021). Cross-country effects and policy responses to COVID-19 in 2020: The Nordic countries. *Economic Analysis and Policy, 71,* 198-210. https://doi.org/10.1016/j.eap.2021.04.015

Griffin, J. J., & Mahon, J. F. (1997). The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-Five Years of Incomparable Research. *Business & Society, 36*(1), 5-31. https://doi.org/10.1177%2F000765039703600102

Hull, J. C. (2018). *Options, futures, and other derivatives (Tenth edition.).* Pearson.

Kempf, A., & Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management, 13*(5), 908-922. https://doi.org/10.1111/j.1468-036X.2007.00402.x

Kiernan, M. J. (2001). Eco-value, Sustainability, and Shareholder Value: Driving Environmental Performance to the Bottom Line. *Environmental Quality Management, 10*(4), 1-12. https://doi.org/10.1002/tqem.1100

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. *The Journal of Finance, 72*(4), 1785-1824. https://doi.org/10.1111/jofi.12505

Margolis, J. D., & Walsh, J. P. (2003). Misery Loves Companies: Rethinking Social Initiatives by Business. *Administrative Science Quarterly*, *48*(2), 268-305. https://doi.org/10.2307/3556659

Mazur, M., Dang, M., & Vega, M. (2021). COVID-19 and the march 2020 stock market crash. Evidence from S&P1500. *Finance Research Letters, 38,* 101690, 1-8. https://doi.org/10.1016/j.frl.2020.101690

Nasdaq, Inc. (2022, April 15). *OMX Nordic 40.* https://indexes.nasdaqomx.com/Index/Overview/OMXN40

Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. *Journal of Banking and Finance, 48,* 180-193. https://doi.org/10.1016/j.jbankfin.2013.12.016

Qiu, S. C., Jiang, J., Liu, X., Chen, M. H., & Yuan, X. (2021). Can corporate social responsibility protect firm value during the COVID-19 pandemic?. *International Journal of Hospitality Management*, *93,* 102759. https://doi.org/10.1016/j.ijhm.2020.102759

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19*. The Review of Corporate Finance Studies, 9*(3), 622-655. https://doi.org/10.1093/rcfs/cfaa012

Refintiv. (2020). Environmental, social and governance (ESG) scores from Refintiv [online]. https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/esg-scores-methodology.pdf

Renneboog, L., Ter Horst, J., & Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance, 32(*9), 1723-1742. https://doi.org/10.1016/j.jbankfin.2007.12.039

Rodgers, W., Choy, H. L., & Guiral, A. (2013). Do Investors Value a Firm's Commitment to Social Activities?. *Journal of Business Ethics*, *114*(4), 607-623. https://doi.org/10.1007/s10551-013-1707-1

Schmidlin, N. (2014). *The Art of Company Valuation and Financial Statement Analysis: A Value Investor's Guide with Real-life Case Studies*. John Wiley & Sons, Inc.

Scholtens, B., & Sievänen, R. (2013). Drivers of Socially Responsible Investing: A Case Study of Four Nordic Countries. *Journal of Business Ethics, 115*(3), 605-616. https://doi.org/10.1007/s10551-012-1410-7

Strand, R., Freeman, R. E., & Hockerts, K. (2015). Corporate Social Responsibility and Sustainability in Scandinavia: An Overwiew. *Journal of Business Ethics, 127*(1), 1-15. https://doi.org/10.1007/s10551-014-2224-6

Sustainalytics. (2022). *ESG Risk Ratings.* https://www.sustainalytics.com/esg-data#overview

Sveriges Riksbank. (2022). Search interest & exchange rates [Data set]. Sveriges Riksbank. https://www.riksbank.se/en-gb/statistics/search-interest--exchange-rates/?g7-SEGVB10YC=on&from=02%2F01%2F2019&to=30%2F12%2F2019&f=Day&c=cAverage&s=Comma

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal, 18*(4), 303-319. https://doi-org.proxy.uwasa.fi/10.1002/(SICI)1097-0266(199704)18:4%3C303::AID-SMJ869%3E3.0.CO;2-G

Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach* (Fifth edition.). Cengage.

World Health Organization. (2020, March 11). *WHO Director-general opening remarks at the media briefing on COVID-19 – 11 March 2020*. World Health Organization. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

Yarmol-Matusiak, E. A., Cipriano, L. E., & Stranges, S. (2021). A comparison of COVID-19 epidemiological indicators in Sweden, Norway, Denmark, and Finland. *Scandinavian Journal of Public Health, 49*(1), 69-78. https://doi.org/10.1177/1403494820980264

Appendices

Appendix 1. Correlation matrix.

	Yearly abnormal return	Volatility	Idiosyncratic volatility	ES18	ROA20	OPM20	AT20	Tobin's Q	Size	Cash	Leverage	ROE	SGA	Dividend yield	Historical volatility	ICB Industry code
Yearly abnormal return	1															
Volatility	-0,14	1														
Idiosyncratic volatility	-0,00883	0,413***	1													
ES 18	-0,0269	-0,197**	-0,109	1												
ROA20	0,186**	-0,0103	0,0345	-0,0394	1											
OPM20	0,175*	0,0952	0,0166	-0,0938	0,547***	1										
AT20	0,0312	-0,0432	0,087	-0,141*	0,473***	0,111	1									
Tobin's Q	-0,0344	0,161*	0,0963	0,0461	0,124	0,0041	0,0828	1								
Size	-0,088	-0,283***	-0,067	0,661***	-0,0546	-0,192**	-0,129	0,257***	1							
Cash	0,269***	0,0442	-0,0966	-0,184*	-0,144*	0,258***	-0,182*	-0,352***	-0,309***	1						
Leverage	-0,0577	0,311***	0,268***	-0,189**	0,0979	0,0755	0,205**	0,584***	-0,0608	-0,410***	1					
ROE	-0,0213	-0,422***	-0,262***	0,171*	-0,328***	-0,442***	-0,269***	-0,08	0,280***	-0,0607	-0,225**	1				
SGA	0,161*	0,0381	-0,143*	-0,098	0,109	0,264***	-0,148*	-0,0298	-0,152*	0,363***	-0,134	-0,0327	1			
Dividend yield	0,00913	-0,227**	0,1	0,257***	0,0396	-0,107	0,0538	0,156*	0,404***	-0,207**	0,0409	0,200**	-0,185**	1		
Historical volatility	0,0954	0,596***	0,290***	-0,360***	-0,0405	0,126	0,00276	0,0156	-0,459***	0,367***	0,0948	-0,450***	0,251***	-0,306***	1	
ICB Industry Code	0,0846	0,214**	0,272***	0,167*	-0,018	-0,127	-0,0979	0,182*	0,272***	-0,0956	0,106	-0,0644	-0,263***	0,179*	0,0279	1

*Accounting variables have been winsorized at 1 % level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$*

Appendix 2. Descriptive statistics of sample with Sustainalytics scores.

Variable	Obs.	Mean	St. Dev	25 %	Median	75 %
Annual abnormal return	185	0,029	0,539	-0,299	0,036	0,342
Quarterly abnormal return	185	-0,161	0,415	-0,393	-0,242	-0,047
ROA20	185	-0,094	7,971	-2,415	0,000	1,711
OPM20	185	3,321	31,222	-1,615	0,175	1,579
AT20	185	-3,674	16,422	-8,196	-2,395	2,472
Volatility	185	0,030	0,011	0,024	0,027	0,032
Idiosyncratic volatility	185	0,145	0,076	0,095	0,100	0,162
Sustainalytics	185	22,006	7,214	16,100	21,900	26,700
Tobin's Q	185	0,560	0,185	0,447	0,571	0,681
Size	185	15,122	1,592	14,107	15,097	16,186
Cash	185	0,085	0,095	0,030	0,059	0,106
Leverage	185	0,277	0,164	0,157	0,260	0,381
ROE	185	0,096	0,364	0,063	0,135	0,199
SGA	185	0,195	0,172	0,079	0,156	0,242
Dividend yield	185	2,425	2,135	0,610	2,190	3,710
Historical volatility	185	0,019	0,007	0,015	0,017	0,021

Appendix 3. Cross-sectional regressions for quarterly abnormal returns for the first quarter of 2020, Sustainalytics score sample.

Variable	(1) Quarterly abnormal returns	(2) Quarterly abnormal returns	(3) Quarterly abnormal returns
Sustainalytics	0.00983**	0.00436	0.00209
	(0.00454)	(0.00475)	(0.00495)
Tobin's Q			-0.293
			(0.178)
Size			-0.0152
			(0.0299)
Cash			-0.0795
			(0.398)
Leverage			0.00909
			(0.269)
ROE			-0.238**
			(0.0929)
SGA			-0.187
			(0.156)
Dividend yield			0.0390**
			(0.0185)
Historical volatility			4.144
			(6.112)
Observations	185	185	185
R-squared	0.029	0.176	0.254
Industry FE	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 4. Cross-sectional regressions on yearly abnormal returns, country comparison sample.

	(1)	(2)	(3)	(4)	(5)	(6)
	SWE	**SWE**	**SWE**	**NODEFI**	**NODEFI**	**NODEFI**
Variable	Yearly abnormal return	Yearly abnormal return	Yearly abnormal return	Yearly abnormal return	Yearly abnormal return	Yearly abnormal return
ES18	-0.187	-0.185	-0.171	0.0933	-0.0268	0.294
	(0.212)	(0.230)	(0.278)	(0.335)	(0.351)	(0.449)
Tobin's Q			-0.103			0.595
			(0.451)			(0.460)
Size			0.0120			-0.0812
			(0.0490)			(0.0882)
Cash			1.208			1.137
			(0.767)			(1.507)
Leverage			-0.116			-0.393
			(0.461)			(0.626)
ROE			0.322			-0.00902***
			(0.350)			(0.00299)
SGA			0.500			0.372
			(0.301)			(0.456)
Dividend yield			-0.0504**			0.0521
			(0.0202)			(0.0371)
Historical volatility			-20.68*			-4.684
			(11.64)			(12.45)
Observations	105	105	105	89	89	89
R-squared	0.009	0.121	0.286	0.001	0.135	0.254
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 5. Cross-sectional regressions for operating performance, NODEFI sample.

NODEFI	(1)	(2)	(3)	(4)	(5)	(6)
Variable	ΔROA20	ΔROA20	ΔOPM20	ΔOPM20	ΔAT20	ΔAT20
ES18	-1.620	-0.985	0.345	2.388	-4.498	5.601
	(2.158)	(2.063)	(1.404)	(3.281)	(6.374)	(4.814)
Tobin's Q	1.319	-1.331	3.176	1.090	11.24	-11.67
	(3.248)	(2.077)	(2.020)	(4.119)	(8.582)	(7.097)
Cash		-11.32		22.14		26.99***
		(13.46)		(28.47)		(6.283)
Leverage		1.740		7.086		37.59***
		(3.454)		(6.709)		(6.466)
Observations	89	89	89	89	89	89
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0,0322	0,0607	0,0104	0,0126	0,0207	0.1137

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 6. Descriptive statistics of sample excluding Telecommunications (15), Financials (30), and Utilities (65) industries.

Variable	Obs.	Mean	St. Dev	25 %	Median	75 %
Yearly abnormal return	178	0,004	0,570	-0,323	0,041	0,313
ROA20	178	-0,254	8,152	-2,516	0,000	1,711
OPM20	178	3,675	31,835	-1,615	0,172	1,570
AT20	178	-4,215	15,723	-8,576	-2,674	2,916
Volatility	178	0,031	0,013	0,024	0,027	0,033
Idiosyncratic volatility	178	0,149	0,078	0,095	0,103	0,162
ES18	178	0,551	0,218	0,376	0,558	0,749
Tobin's Q	178	0,565	0,168	0,454	0,588	0,683
Size	178	15,036	1,513	14,107	14,963	16,063
Cash	178	0,087	0,097	0,031	0,060	0,108
Leverage	178	0,284	0,161	0,166	0,276	0,392
ROE	178	0,092	0,371	0,060	0,135	0,195
SGA	178	0,204	0,175	0,096	0,159	0,251
Dividend yield	178	2,366	2,124	0,510	2,175	3,690
Historical volatility	178	0,020	0,008	0,016	0,018	0,022

Appendix 7. Cross-sectional regressions of yearly abnormal returns, sample excluding Telecommunications (15), Financials (30), and Utilities (65) industries.

Variable	(1) Yearly abnormal return	(2) Yearly abnormal return	(3) Yearly abnormal return
ES18	-0.0697	-0.147	0.00126
	(0.195)	(0.211)	(0.288)
Tobin's Q			0.216
			(0.262)
Size			-0.0125
			(0.0506)
Cash			1.611**
			(0.806)
Leverage			0.0344
			(0.365)
ROE			-0.334**
			(0.149)
SGA			0.417
			(0.253)
Dividend yield			0.0162
			(0.0245)
Historical volatility			-11.98
			(9.442)
Observations	178	178	178
R-squared	0.001	0.074	0.182
Industry FE	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 8. Cross-sectional regressions for operating performance, sample excluding Telecommunications (15), Financials (30), and Utilities (65) industries.

Variable	(1) ΔROA20	(2) ΔROA20	(3) ΔOPM20	(4) ΔOPM20	(5) ΔAT20	(6) ΔAT20
ES18	-1.450	-1.639	0.565	0.344	-7.153*	0.0388
	(0.983)	(1.128)	(0.876)	(0.957)	(3.781)	(3.178)
Tobin's Q	1.705	1.750*	0.636	0.610	8.417*	-3.589
	(1.224)	(0.991)	(1.252)	(1.352)	(4.877)	(3.563)
Cash		-10.77*		-2.070		-8.596
		(6.244)		(5.234)		(17.20)
Leverage		-1.044		-0.463		19.91***
		(1.493)		(1.159)		(4.697)
Observations	178	178	178	178	178	178
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 9. Descriptive statistics of the sample that excludes Real Estate (35), Consumer Discretionary (40), and Energy (60) industries.

Variable	Obs.	Mean	St. Dev	25 %	Median	75 %
Yearly abnormal return	137	-0,045	0,472	-0,305	-0,001	0,250
Quarterly abnormal return	137	-0,147	0,368	-0,332	-0,223	-0,049
ROA20	137	0,103	6,883	-2,033	0,000	1,416
OPM20	137	4,544	35,729	-1,266	0,285	1,579
AT20	137	-2,100	12,366	-7,837	-2,650	2,415
Volatility	137	0,027	0,007	0,023	0,025	0,029
Idiosyncratic volatility	137	0,137	0,065	0,094	0,099	0,160
Tobin's Q	137	0,555	0,189	0,452	0,565	0,666
Size	137	15,263	1,582	14,385	15,366	16,390
Cash	137	0,808	0,093	0,031	0,059	0,102
Leverage	137	0,263	0,151	0,166	0,244	0,344
ROE	137	0,131	0,153	0,068	0,138	0,207
SGA	137	0,195	0,165	0,089	0,149	0,255
Dividend yield	137	2,364	2,122	0,630	2,110	3,410
Historical volatility	137	0,019	0,006	0,015	0,017	0,021

Appendix 10. Cross sectional regressions of yearly abnormal return and quarterly abnormal return, sample excluding Real Estate (35), Consumer Discretionary (40), and Energy (60) industries.

Variable	(1) Yearly abnormal return	(2) Yearly abnormal return	(3) Yearly abnormal return	(4) Quarterly abnormal return	(5) Quarterly abnormal return	(6) Quarterly abnormal return
ES18	0.0769	0.00295	0.165	0.00127	-0.191	-0.188
	(0.183)	(0.224)	(0.274)	(0.143)	(0.179)	(0.206)
Tobin's Q			0.316			-0.239
			(0.332)			(0.199)
Size			-0.0234			0.00999
			(0.0426)			(0.0320)
Cash			0.535			-0.227
			(0.591)			(0.398)
Leverage			0.312			0.155
			(0.394)			(0.277)
ROE			-0.175			0.114
			(0.284)			(0.246)
SGA			0.606*			-0.145
			(0.311)			(0.181)
Dividend yield			-0.0216			0.00720
			(0.0210)			(0.0182)
Historical volatility			-15.83*			7.020
			(9.087)			(7.528)
Observations	137	137	137	137	137	137
R-squared	0.001	0.069	0.168	0.000	0.205	0.229
Industry FE	No	Yes	Yes	No	Yes	Yes

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*

Appendix 11. VIF tests for the main sample.

Variable	(1) Yearly abnormal re-turn	(2) Volatility	(3) Idiosyncratic volatility
ES18	-0.0704	0.000525	-0.0309
	(0.202)	(0.00253)	(0.0239)
Tobin's Q	0.153	-0.000170	-0.0520*
	(0.308)	(0.00371)	(0.0265)
Cash	2.235***	-0.0159	-0.135**
	(0.715)	(0.0122)	(0.0683)
Leverage	0.258	0.0128**	0.0792**
	(0.357)	(0.00499)	(0.0363)
ROE	0.0225	-0.0102**	-0.0358
	(0.311)	(0.00442)	(0.0293)
SGA	0.484*	0.00279	-0.00886
	(0.248)	(0.00452)	(0.0273)
Dividend yield	0.00400	-0.000696*	0.00776**
	(0.0229)	(0.000384)	(0.00328)
Historical volatility	-11.57	0.776***	3.075***
	(9.680)	(0.148)	(0.865)
Observations	194	194	194
R-squared	0.163	0.579	0.434
Omitted variable	Size	Size	Size

*Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1*