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ESG or Financial Performance – Does It Have to Be a Choice?

A Regression Analysis of Thomson Reuters ESG scores and Financial Performance in Sweden and the UK

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Abstract

Background: The term Environmental, Social, and Governance (ESG) is a relatively new concept within the financial industry. However, there are a couple of issues connected to the ESG score and sustainable finance. Thus, there is an ongoing conflict between creating economic value, which is the main task for managers, as well as tackling ethical issues such as ESG.

Purpose: The purpose of this report is to investigate if there is a correlation between ESG scores and financial performance measures. The measures analysed are, Return on Assets (ROA), Retention Ratio (RET), Operating Cash-Flow (CF) and Debt-Equity (DE), for listed companies in Sweden and the UK.

Method: To see if there is a correlation between ESG and financial performance, a Pooled OLS Regression and Fixed Effect Regression Model (FE) was used. The data was collected from the Thomson Reuters datastream, where 75 companies listed on the OMXSLCGI in Sweden and 75 companies listed on the FTSE100 in the UK, was retrieved.

Conclusion: The regression results indicated a positive correlation between CF and ESG for both the FE regression and the Pooled OLS for the Swedish middle-ranked companies, as well as a positive correlation between DE and ESG for the lower-ranked Swedish companies. For the UK, no significant variables were found. Because of the limited significant results, this thesis found that there is yet no apparent correlation between the ESG score and financial performance based on the four years analyzed.

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Definitions

CF - Cash Flow from Operating Activities

CSP - Corporate Sustainable Performance

CSR - Corporate Social Responsibility

DE - Debt/ Equity ratio

EBIT - Earnings Before Interest and Tax

ESG - Environmental Social Governance

FE - Fixed Effect Regression Model

FP - Financial Performance

HLEG - High Level Expert Group

KPI - Key Performance Indicators

OLS - Ordinary Least Square Regression Model

RET - Retention ratio

ROA - Return on Assets

SRI - Social Responsible Investments

1. Introduction

The first chapter starts with a short introduction and background information about the topic. Chapter one continues by stating the research problem as well as the purpose of this thesis and the research questions are presented. The chapter is completed with delimitations regarding the topic.

The concept of sustainability is not new to the financial market; however, during recent years, it has grown in popularity and importance as the population has grown more worried about the future of this planet. Because of climate change, the relationship between sustainability and economic growth has become heavily discussed. There are previous studies that have investigated the possibility of a correlation between Environment, Social, and Governance (ESG), and financial performance. However, none of the previous studies have compared Sweden and the UK, and therefore this is an interesting topic to investigate.

1.1. Background

By the end of March 2018, the European Commission implemented an "action plan on sustainable finance" which is based on the recommendations from the High Level Expert Group (HLEG). The action plan aims to simplify and increase the understanding of the strategy to combine finance and sustainability. One of the main tasks is, therefore, to improve the transparency of companies' ESG policies.

The Environment, which is the first component of ESG, combined with economic growth, is a hot topic in society. To prevent environmental changes, the EU members signed the Paris Agreement in 2015. After the Paris Agreement, the EU implemented new regulations during 2018 with the intention to reduce greenhouse emissions by 2030. The key targets connected to the regulations specify that the countries within the EU must cut their emissions by at least 40% compared to the levels from 1990, implement at least 32% of renewable energy and, improve the energy efficiency by 32.5% (European Commission, 2020).

Two of the issues that the Social (S) part of ESG covers are human rights and fair trade, and according to Fairtrade's website, sustainable trade is dependent on human rights. Therefore, Fairtrade (2020) encourages companies to analyse the supply chain to ensure that human rights are respected.

The two theories connected to the final component of ESG, which is Governance (G), are the stakeholder theory and the shareholder theory. These theories imply that the managers of a company must choose between them, where the core of the shareholder theory is to create value for their shareholders. The main objective of the stakeholder theory is to create value for the employees, customers, and the shareholders. However, one problem that could pose as a threat within a company is corruption. A recent example is the money-laundering scandal related to the Swedish bank Swedbank, where the suspicions of this incident arose during the spring of 2019 (Schwartzkopf, 2019).

ESG is not only important from an ethical point of view, it is also argued to be important from an investment perspective as well. According to OECD (2017), the ESG factors have shown to be essential drivers for the risk and return of portfolios. This is confirmed in a report by Bloomberg (2018). The report states that investors have understood that ESG issues might have a material effect on industries and impact the value of their portfolios. Therefore, different agencies are calculating these scores and ranking companies according to the ESG measurement to guide both companies and investors towards more sustainable investments. Thus, there is a need for a ranking system to determine how companies work with ESG, for all actors on the market. However, the ranking system used today is somewhat confusing since the different agents use their own methodologies, which are related to cultural and ideological factors. Thus, different agents can obtain different scores, even though they must respect the same criteria (Dorfleitner et al., 2015).

To determine to what extent companies are working with ESG related risks, an ESG score is obtained. The ESG score is a way for companies to compare their sustainability performance to their competitors. The ESG scores are provided by "sustainability rating agencies," which have been accepted as agents within the market. The sustainability

agents use different kinds of information from companies and the public to calculate ESG scores (Cui et al., 2016). A few of these rating agencies are Morgan Stanley Capital International (MSCI), RobecoSAM, Viego-EIRIS, and Thomson Reuters (Escrig-Olmedo et al., 2019).

According to Thomson Reuters (2013), the ESG Score was developed for reasonable assessments of Corporate Social Responsibility (CSR) for both investments as well as for other agents who find ESG important. They further explain that the goal of the ESG score is to increase transparency, consistency, and illegal discoveries among organizations. Even though ESG is important, one cannot escape the fact that the financial performance of a company is crucial for its survival.

To determine a company's financial performance, its financial and non-financial measures are examined. These measures are indicators connected to financial performance and analysis in the form of assets, cash-flows, and net income, among others. It is evident that financial performance is crucial for companies' survival; however, it is argued that ESG is equally important for a company to survive in the long-run. For a company to survive, it must be accepted by society. The acceptance-need, together with the societal trends that focus on sustainability within firms, indicates that companies with a high ESG score reduce their risk. Hence, it is argued by Syed (2017) that sustainable companies have a strong financial performance in the long-run. These new demands of reducing climate change force companies to change their strategies to succeed in the long-run. However, it is challenging to build a strategy that balances environmental, social, and economic needs for both the company and society (Epstein & Roy, 2001).

The three factors within ESG are influenced in different ways in various countries, which can be observed for Sweden and the UK. One of the differences concerns the use of renewable energy[1], which is one factor within the environmental aspect of ESG. Sweden uses 58.79% renewable energy, while this share only represents 33% of the total energy production in the UK (SCB, 2018; UK Government, 2018). These reports show that Sweden has a larger share of renewable energy sources of their total production. Another difference between the two countries analysed is the minimum wage rate. The Swedish

[1] Renewable energy sources include hydro-, wind-, solar-, biomass- and geothermal power (National Geographic, 2019).

minimum wage is approximately 25,500 SEK per month (SCB, 2018), while it is £1,252.8[2] per month in the UK (UK Government, 2018). The UK minimum wage is correspondingly 14,217[3] SEK, which indicates that wages are lower in the UK compared to Sweden. These indicators show that these two countries have different policies regarding the aspects of ESG.

1.2. Problem Statement

The increased demand for sustainable solutions and investments requires companies to adjust. At the same time, new sustainable solutions, for example, product development, change in production, increased wages, and improved working conditions, often lead to an increase in expenses. The increased expenses can have a negative impact on companies in the short-run before achieving the long-run benefits. However, there are important aspects within ESG that need to be taken into consideration since climate changes worsen, and several workers still live on minimum wages. Syed (2017) addresses this dilemma by explaining that managers are considering making ESG part of their investment process; still, it is not prioritised. Syed explains that managers' essential tasks should be to run their business effectively and have a strong financial performance. Thus, managers must have a clear view of their goals in terms of their investment choices, and they must choose to either increase economic- or ethical value.

Therefore, this thesis will investigate if there must be a choice between ethics and value creation or if a correlation exists between a high ESG score and a strong financial performance. The measurements that will be analysed are Return on Assets (ROA), Retention ratio, Operating Cash-Flow (CF), and Debt-equity (DE). To contribute to new research, three new measures were added in addition to ROA. These measurements include different components of values within a company; hence, they provide various indications of the financial performance of a company.

Since ESG is a relatively new concept, few studies have investigated this relationship, as can be seen, previous studies have used data before 2014 (Eccles et al., 2014; Friede et al., 2015; Teti et al., 2015; Velte, 2017). Besides, these studies have been implemented

[2] £7.83 * 40hours * 4weaks = £1 252.8

[3] The Exchange rate was 11.3482 the 31st of December 2018 (Riksbanken.se, 2020); £1 252.8 * 11.3482 = 14 217 SEK.

on larger economies such as the US and Germany. To our knowledge, a comparison between Sweden and the UK has not yet been investigated. Therefore, a study where a comparison between Sweden and the UK is conducted could contribute with new research to already existing research. This comparison is interesting because of the difference in economies and the similarities in culture. The UK is a much larger economy than Sweden (Bajpai, 2020); however, the two countries are similar in terms of culture, which contributes to an interesting comparison. Another factor that makes this comparison noteworthy is that Sweden and the UK have chosen to implement ESG differently. Thus, it could be interesting to see if this will result in different outcomes for Sweden and the UK.

1.3. Purpose

The purpose of this report is to investigate, through running a multiple linear regression, if there is a significant correlation between financial performance and the ESG score for the two countries, Sweden and the UK. Further, the differences in the countries' regression results will be analysed.

1.4. Research Questions

RQ1: Is there a correlation between the ESG score and financial performance among the largest companies on the Swedish stock market?

RQ2: Is there a correlation between the ESG score and financial performance for the largest companies on the British stock market?

RQ3: Is there a difference between the different ranked groups of high, middle, and low ESG scores?

RQ4: Is there any difference between the two countries Sweden and the UK?

1.5. Delimitations

One delimitation for this report concerns the EU policies. There have been more guidelines and policies regarding sustainable finance and the term ESG rather than

specific regulations. Since the individual countries set their own regulations, it is difficult to assess and compare the two countries based on individual regulations. Because of this factor, it could be challenging to use separate regulations as a frame of reference when interpreting and analysing the data. Therefore, in this thesis, the EU policies will be used as a frame of reference and not the individual countries' regulations.

2. Theoretical Framework

This chapter begins with an explanation of the search strategy, followed by a review of the literature regarding sustainable finance, ESG, EU policies, and Financial performance.

2.1. Search Strategy

To gain insight into the topic of ESG, policies, and financial performance, various information was gathered through search engines as well as websites of different authorities and the EU. The different search engines used were ABI Inform, Google scholar, Web of science, and Proquest. The most commonly used search terms include ESG, sustainable finance, financial performance, and financial measures; these have been used in different combinations to find the most relevant sources for this thesis. Therefore, when determining the relevance and reliability of the articles or sources, different filters have been used, such as *peer-reviewed*, *scholarly journals*, and *articles*. However, since ESG is relatively new, the use of the function *citations* has been limited. Another aspect taken into consideration when searching for articles was the relevance in terms of how recent the literature and previous research was. The final function used to find relevant articles or other sources was to review the references in articles related to the topic.

2.2. Sustainable Finance

Sustainable finance is an important and growing subject which is stated in the EU's action plan from 2018, where ESG is a big part of sustainable finance. Furthermore, Soppe (2004) writes that sustainable corporate finance is an approach where the social, environmental, and financial parts are combined and unified. The EU definition of sustainable development is "… the classical Brundtland version development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987).

Furthermore, Soppe (2004) states that in previous research, it has been discussed that wealth is a function of capital, nature, and labour. During the 19th century, labour was an essential part of that function. However, in the 20th century, capital became the main

driver to create value. Thus, it could be argued that nature should be the next main driver because of the current environmental issues.

In addition, the concept of sustainable finance contains behavioural development, which sees the agent on the financial market as a human being with morals, which is discussed within business ethics. Thus, the companies cannot merely focus on making a profit but must consider other dimensions within society (Soppe, 2004).

According to Drempetic et al. (2019), investing more capital in companies that are more sustainable, is one way of reaching the sustainable development goals formed by the EU. Furthermore, Lagoarde-Segot (2011) is arguing that, according to modern portfolio theory, diversification with a foundation in social and environmental criteria reduces profit. However, Epstein and Roy (2001) argue that firms that are socially responsible are more innovative and cost-efficient, which in turn is attractive for qualified staff. These cost reductions and product improvements could create a positive response among consumers. Thus, the authors argue that a strong sustainability performance can lead to customer loyalty, which in turn leads to an increased stream of consumption. Hence, these firms often have higher profits and therefore generate higher alfas than stocks that are not socially responsible.

2.2.1. Corporate Social Responsibility

The purpose of CSR is to increase shareholder value as well as their social responsibility. The European Commission altered the definition of CSR in 2011. The new definition was then: "The responsibility of enterprises for their impacts on society" (European Commission, 2011). The commission says that for the companies to meet these responsibilities, they must include factors such as social, environmental, ethical, as well as consumer concerns into their operations (European Commission, 2011).

2.3. Environmental, Social and Governance (ESG)

ESG is a new part of "Socially responsible investments" also called SRI (Syed, 2017), where SRI is an approach where unethical industries are excluded from the portfolio. The purpose of the ESG framework is to have a positive effect on the society, environment, and the firm's issues regarding Governance (Syed, 2017). According to Galbreath (2013),

the environmental factor within ESG considers pollution, climate change, and the use of water and energy. While on the other hand, the social component of ESG incorporates working with human rights, fair trade, equality between the sexes, product safety, and health. The last part of ESG, Governance, tackles issues that are connected to corporate governance, which could be independence of the board, corruption, reporting, and disclosure as well as protection of their shareholders.

Since the ESG focuses on these three parts to determine a firm's potential in the long-run, a strong performance in terms of environmental and social awareness and a strong governance record reduces risk. Thus this is an indication of a strong financial performance for many years ahead (Syed, 2017).

However, Syed (2017) argues that there are divided opinions regarding ESG when it comes to the foundation of the phrase. The first opinion implies that ESG is a broader and more developed term of SRI. On the other hand, the other opinion implies that SRI is derived from the ESG, which focuses on what is right and wrong and is thus, a more constricted approach that is aimed towards the retail industry. The ESG is used by "institutional investors" with an approach intended to be aimed towards everybody, instead of only targeting the retail industry.

Based on the two opinions mentioned above, it is difficult to draw a line between ESG and SRI as well as determining if they overlap at any point. The author writes that ESG is thought of as a tool or procedure to determine good management practices, with a concentration on fundamentals (Syed, 2017). By using the ESG framework as part of their primary criteria, the firms are combining an approach of governance and SRI. Therefore, there are companies that are socially responsible and use ESG criteria when making investment decisions today. Thus, this demonstrates that ESG is a term that was developed from SRI but is, in fact, an extension of it (Syed, 2017).

Furthermore, Clarkson (1995) states that the main characters of a company are the managers. The way an organization acts depends on many contractor factors, where one factor is value creation for the shareholders. However, another critical challenge for managers today is to balance a strong business performance with ethical dimensions. To

embrace this challenge, managers must know which ethical practices that are ideal for their company. A manager's primary task should always be to run their business in the most efficient way possible, as well as trying to achieve good management- and financial performance (Syed, 2017).

According to Kocmanová and Dočekalová (2012), ESG is an important part when deciding and evaluating sustainable development within finance and investments. The authors then continue by saying that including the ESG concept into their financial investing procedures maximizes the company's, as well as their shareholders, long-term interests. However, these results focus on a Czech perspective, which implies that the results found, apply to that specific country and values used. The results might then differ depending on the country, as well as ESG score and financial performance measures used.

2.3.1. Stakeholder Theory and Shareholder Theory

One of the two theories within Governance is the Shareholder theory, which was first presented by Milton Friedman (1970) in The New York Times. Friedman further explained how the theory refers to the managers increasing value for the shareholders, which could imply that the managers act in favour of the shareholders, without any positive impact on the company itself. This could mean that they refrain from an action that would benefit the company and would, therefore, decrease the value, or work against the interest, of the shareholders.

Freeman (2010), however, came with an alternative theory that shifted focus from solely the shareholders of a company by incorporating the stakeholders. This theory allowed the managers to include employees, customers, and the shareholders of the company when making decisions.

These two, which are an essential part within the governance aspect of the ESG score, have created a dilemma for managers when making decisions concerning the company. Jeff Smith (2003) discusses the differences between the two theories to shed some light on the situation in corporate society. This can be applied to more recent scandals, which

occurred in 2015 and 2019 for the companies Telia[4] and Swedbank[5]. The author then continues by stating that many critics within the subject say these scandals show a failure within the shareholder theory while calling a victory for the stakeholder theory.

Smith (2003) further explain what the main focuses are of the two theories, shareholder and stakeholder. The author explains that these two theories are *normative,* meaning they indicate what a company's role ought to be in the aspect of corporate social responsibility. The main focus depends on the theory, the shareholder theory's main goal is to increase the value of capital to their managers, which are expected to spend the company's resources in a way that has been permitted by the shareholders of the firm. According to Smith, the stakeholder theory focuses on the obligation of the company towards the stakeholders. The stakeholders can be translated into shareholders, consumers, personnel, suppliers, and the community, which implies that CSR should be included in the management processes.

An example Smith (2003) acknowledges in his article is that the shareholder theory is orientated towards maximizing short-term profitability while disregarding the long-term expenses that may originate from it. However, according to Smith, this is typically not the case since the debate focuses on enlightened self-interest, which would shift the managers towards more long-term decisions. This implies that managers act on behalf of their individual interests. Depending on the manager, the focus will be either to create higher value in the short-run since these benefits will be achieved sooner or to create value in the long-run.

Like with the shareholder theory, there are some confusions regarding the stakeholder theory as well. Smith (2003) explains that a common misunderstanding is that the theory does not focus on profitability, which is not the case. Since, according to the theory, all stakeholder's interests are considered, which include the shareholders. This means that the theory is focusing on profitability; however, it may not be to the same extent as the shareholder theory.

[4] This scandal concerns the Swedish telecom company Telia, who helped Azerbaijan's presidential family swindle approximately SEK 6 billion (sverigesradio.se, 2015)
[5] This arose over suspicions that the Swedish bank, Swedbank was part of a money-laundering scandal, which has been confirmed (Schwartzkopf, 2019)

Both Freeman et al. (2010) and Kramer and Porter (2011) argue that companies can increase their values when working with sustainability and ESG. By including stakeholder values, when making a decision, the value for the shareholders will increase as well. However, if the stakeholders, thus, the employees and customers are ignored, they can turn to different companies, which will decrease the company's value in the long-run.

2.4. ESG Score

To comprehend the core of sustainable finance, it is essential to know what the ESG score measures, since the ESG score is part of determining a company's corporate sustainable performance (CSP) (Drempetic et al., 2019).

Thus, the ESG score is a non-financial way of assessing companies where the purpose is to evaluate how, and to what extent, they work with environmental, social and governance aspects (Achim & Borlea, 2015). One definition of the ESG scores is that it is an additional financial measure of valuation risk, that is intangible. By taking main performance indicators for industries within ESG, the factors that represent opportunities and risks for firms and industries can be analysed (Bloomberg, 2013a, 2013b). However, Bloomberg's ESG scores are criticised because of its purpose, which is to increase financial profit. According to Lloyed (2018), this could lead to bias, which could affect data integrity.

However, there are short-term issues with sustainable finance. For example, companies might experience additional costs in the short-run when trying to increase the environmental performance. Muhmad and Muhamad (2020) explain that carbon tax, which is a way to reduce carbon emissions, contribute to these expenses. The production costs for manufacturing companies will, therefore, increase because of the carbon tax. However, the atuthors argue that sustainable finance will increase the profitability in the long-run in terms of stakeholder relationships and profitability (Ma et al. 2017; Muhmad & Muhamad, 2020; Cheng et al. 2017).

According to Escrig-Olmedo et al. (2019), MSCI, RobecoSAM, and Viego-EIRIS merge are rating agencies that provide ESG scores. Other agencies are Bloomberg (Bloomberg, 2019) and Thomson Reuters (Tarmuji et al., 2016), where Thomson Reuters will be used in this thesis.

Dorfleitner et al. (2015) investigated the different databases that provide ESG scores to see how much they differ from each other. The databases compared were Bloomberg, Thomson Reuters, and the KLD ratings, and they found variation in the methodologies used. For instance, Bloomberg provides ESG data for 4100 companies in 52 different countries. Thomson Reuters' provided ESG data for 4300 companies worldwide during 2014, and the KLD provided data for the 3000 largest companies in the US during 2003. The KLD does not provide an overall ESG score nor an individual ESG sub-criteria score. Thus, the ESG score provided by the KLD is presented by binary ESG indicators. Thomson Reuters, on the other hand, divides the binary data points into 18 category scores, which are divided into pillars that represent the ESG factors. These pillars are equally weighted when calculating the score, and all scores are normalized and benchmarked against the total 4000 companies. Bloomberg calculates a "total ESG disclosure score," which combines the factors of the ESG disclosure scores. These are then tailored towards different business sectors so that the data points that the companies are evaluated on are relevant for the industry it practices within. However, there were no significant statistical differences regarding the variances of the scores reported.

2.5. EU Policies and Regulations

According to the European Commission (2018), the financial sectors and centers are important for the promotions concerning sustainable finance. In addition, the expansion of sustainability goals and climate actions are growing within different sectors in the economy (European Commission, 2018). It is stated in the report that since ESG is a relatively new concept and subject for the financial sectors, the number of centers that officially work toward these goals are still low. For this to expand, the EU must encourage this behaviour and support the green and sustainable financial initiatives; this implies that the fiscal policies implemented must be evaluated.

Based on the situation regarding sustainability, present within the financial sectors, the High Level Expert Group (HLEG) recommends that the financial sectors have to be more specific and more transparent regarding the ESG reporting. Another recommendation is that these sectors review their policies and systems, such as the fiscal situation. It is also important that the time and effort needed for green and sustainable actions and investments are prioritized (European Commission, 2018).

In a report by KPMG (2019), it is written that after the recommendations from the European Commission, different countries have taken different actions regarding sustainable finance. Some governments have chosen to apply specific restrictions while others have chosen to let the market be the main driver. The Swedish government has, according to a report conducted by the Swedish financial supervisory authority (Finansinspektionen, 2018), chosen to incorporate sustainability as a part of the whole corporate governance and not limit it to certain areas of corporate governance. The UK , on the other hand, decided to work with three pillars to strengthen the competitiveness within the financial sector and to align environmentally friendly growth with the financial flows in the private sector. The three pillars are the following, "greening finance," "financing green," and "capturing the opportunity" (the Green Finance Strategy report, 2019).

However, Goodhart (2008) mentions one issue that is connected to the EU policies, the *boundary problem*, which sums up the challenge of internalising external factors. This means that when stricter regulations are implemented into one segment, the business will be shifted to other segments and to other countries with fewer requirements. Another example is when national restrictions for products can be avoided by relocating the production to other countries with fewer restrictions. When looking at issues present in the finance sector, the "sustainable" investors sell the unsustainable investments, but these investments are then "picked up" again by other investors who see these as undervalued investments (Schoenmaker & Wierts, 2015). The authors then propose that a solution to this problem could be an activity or product-based regulation.

In addition, Schoenmaker and Tilburg (2016) present another way to solve the boundary problem, which is to supervise and decrease the financial imbalances within the whole

financial sector that arise because of ecological pressure. The authors propose that this could be done by supervisors and central banks through, for instance, *carbon stress tests*. This stress test would reveal concentrations in and overexposures to assets that are "carbon-intensive," which includes all sectors that use fossil fuels in any way.

2.6. Financial Measures

Some of the most common traditional financial performance measures are according to Bernard (1999) Return on assets (ROA), Return on equity (ROE), Return on capital (ROC), Debt-Equity ratio, Retention ratio among others. The authors continue by saying that the performance indicators used and calculated depend on the growth stage of a company; for example, a business that is in the start-up phase would focus on the growth performance, while a more stable firm would focus on maximizing their profit. Previous studies that are presented under the upcoming section 2.7. has apart from these accounting-based measures used market-based measures such as Tobins'q and stock returns (Teti et al., 2015; Eccles et al., 2014; Friede et al., 2015; Velte, 2017).

2.6.1. ROA

According to Selling and Stickney (1989), the return on assets (ROA) is a measure that shows the success of a company by using their assets in comparison to their earnings, which are independent of the financing, which means either debt or equity. This means that ROA includes variables such as net income, tax rate, interest expense, as well as the total assets when calculated. The authors continue by explaining that changes in ROA are connected to either the operating leverage or product-life-cycle trends. This shows that companies with smaller operating leverage have a more stable ROA than companies with greater operating leverage. According to Damodaran (2012), the formula to calculate ROA is:[6]

$$ROA = \frac{EBIT*(1-T_c)}{Total\ Assets} \quad (1)$$

[6] EBIT stands for "Earnings before interest and taxes", and Tc stands for "Tax rate"

2.6.2. Operating Cash Flow

Cheng et al. (2020) state that the operating cash flow (CF) of a company is an essential part when evaluating the performance of the company. The authors continue by saying that as time has passed, more people have started to acknowledge the importance of the measurement, such as investors and other professionals in the field. Cheng et al. are critical to the opinion that CF cannot be managed. Instead, the authors consider the measurement to be a benchmark when evaluating the predictability of earnings. In another paper by Rayburn and Jennings (1986), the author explains that the process where earnings are connected to operating activities is a function of when cash flows are transformed into earnings. This measure can then be used to see the relationship between earnings and different activities within the company, which makes it an important financial performance measurement. According to Rist and Pizzica (2015), the formula for Operating Cash Flow is the following:

$$CF = \big(EBIT * (1 - Tax\ rate)\big) + Depreciation + Amortization \quad (2)$$

2.6.3. Retention Ratio

In their study, Sasaki and Fujita (2011) mention that the retention ratio of a firm is the amount that the company decides to keep within the company. I.e., how much they are reinvesting back into the company and therefore, do not pay out to their shareholders, which is confirmed by Kahn et al. (2011). The retention ratio is calculated by subtracting the company's total dividend from earnings and dividing that by the earnings. The authors continue by saying that this ratio is used in combination with the dividend to see its effects on stock prices. In an article by Lieu et al. (2008), it is stated that stable firms tend to have lower retention ratio as well as a lower likelihood of financial distress. Retention ratio can also be written as reinvestment rate in different articles or sources. Chakravarty and Xiang (2011) and Hanusch and Pyka (2007) states that reinvestments are placed into areas such as development and research as well as human resources. These two areas include attracting new employees, who contribute to innovative solutions in order to increase the firm's profit. Based on the information provided by Kahn et al. (2011), the formula for retention ratio is:

$$Retention\ ratio = 1 - Dividend\ pay\text{-}out \quad (3)$$

2.6.4. Debt-Equity Ratio

According to Bhandari (1988), the debt-equity ratio is used to estimate the risk of a company's equity, by dividing the debt by the equity. Bhandari then continues by explaining that if the ratio increases, so does the risk that is connected to the common equity. The ratio is expected to be positively correlated to a company's equity risk; this is then the reason for the ratio being used as an alternative to risk in an analysis. The risks that are connected to this ratio are the business and financial risk (Bender, 2014). Business risk is the risk within the firm, which is not correlated with the financing of the company. Thus, business risk determines a company's ability to make enough profit to cover its operational costs and thereby make a profit. The financial risk is the risk for bankruptcy and is focused on the debt and financial leverage of the firm (Gabriel et al. 1980). Between these two, there should be a negative correlation; if the business risk is increasing, the financial risk should decrease. The level of risk depends on the growth phase of a company, thus, if a company is in a stable growth phase the business risk should decrease since it becomes less risky to invest, and vice versa for firms in an unstable growth phase. When the business risk decrease, the financial risk should increase, which can be done by increasing the debt in the company. Thus, the debt-equity ratio should increase as a company gets more stable (Bender, 2014). The formula to calculate the debt-equity ratio is, according to Damodaran (2012):

$$Debt\text{-}equity\ ratio = \frac{Debt}{Equity} \qquad (4)$$

2.7. ESG and Financial Performance

There have been a few previous studies to investigate if there is a relationship between ESG and different financial performance measures. One previous study conducted by Teti et al. (2015) for the period 2005-2010, with a sample between 191 to 538 companies, found that sustainable investments can create value for both the investor and the companies.

Eccles et al. (2014), tested 90 companies that were considered to be highly sustainable and 90 unsustainable companies in the US for an 18 year period between the years 1993 and 2010, to find the effect of sustainability in companies processes and performance.

From this study, the authors found significant results saying that highly sustainable companies surpassed the other, less sustainable, companies in the long-run in both the stock market and accounting performances. Another conclusion drawn by the authors is that less sustainable companies focus more on maximizing their profit and sustainability is seen as an externality.

Fried et al. (2015) conducted a meta-analysis on approximately 2200 individual studies, where they found a positive relationship in 90 percent of the cases, with a significance level of 0.05, where they tested the ESG against corporate financial performance. The authors also concluded that the positive impact ESG has on CFP seems to be stable in the long-run.

In a previous study by Velte (2017), the impact of ESG on the CFP for German companies such as DAX30[7], TecDAX[8] , and MDAX[9] was investigated. For the research, Velte conducted the study on 412 observations over the time-period between 2010 and 2014. The number of companies ranged from 80 to 85 for the four years. The results showed, as the two previous studies mentioned, a positive impact on financial performance when the three factors are tested individually. Velte found that the factor, Governance, had the biggest influence on the financial performance contrasted to the other two factors. However, when the author tested the ESG against Tobin's Q, which is the financial performance based on the market, no significant impact was found in the relationship between the variables.

[7] DAX30 is the German stock market index, with companies trading on the Frankfurt Stock Exchange (Lobel, 2020).
[8] TecDAX is an index containing the 30 companies ranked directly beneath the DAX stocks in terms of size (Deutsche Börse Group, 2020b).
[9] MDAX is an index that contains the 60 largest companies beneath the DAX stock (Deutsche Börse Group, 2020a).

3. Methodology

Chapter three explains the scientific research approach, which is followed by a description of the data, data collection, and data analysis. Finally, the hypotheses are described, and the limitations are acknowledged.

3.1. Scientific Research

Within the scientific research on methodology, several areas need to be decided and clarified when conducting a research report, according to Saunders et al. (2016). These areas are research philosophies, approaches, and designs, which are based on different aspects and approaches.

However, for this research, a positivistic philosophy will be used since this report is using a larger scaled sample as well as a quantitative data set. Hence, a quantitative method is most appropriate since this method is, just like the philosophy, used for larger scaled data sets as well as for statistical analysis. This is the case with the data regarding the ESG score as well as financial performance indicators. The most suitable approach for this report is a deductive method since, for this method, the theory must be determined first, and the data is collected based on the theory in order to find evidence for or against the already existing theory (Saunders et al., 2016).

Within the final area, substantial deductions must be made depending on the purpose of the research design. The type of study that is conducted in this report is a combination of exploratory and explanatory studies. An exploratory study is, according to Saunders et al. (2016), when the research questions are open in order to discover and explain what happens as well as gaining insight and interest in the subject. While the explanatory studies are more about creating a fundamental relationship between different variables in the research. Based on these deductions, this report will be based on a combination of these two, and gain insight into the subject as well as investigating if there is a relationship between the variables ESG and financial performance. ESG is not formally seen as an approach within finance; however, there is still a policy pressure on the concept. Hence

it is an important aspect when investigating the relationship. Another aspect of the analytical tests of this report is the null hypothesis, which consists of a prediction that there will not be a significant relationship between the variables.

3.2. Data Sampling

The countries that will be compared are Sweden and the United Kingdom. The original plan of action was to have around 20 companies that had a low ESG score, 20 with a moderate ESG score, and 20 with a high ESG score. Thus, a variety of both higher and lower scores leads to a more fair approach. However, when reviewing the data, the sample was slightly small. Therefore, the remaining companies that had the financial information needed and an ESG score for the period analysed were retrieved. Each group was thereby increased, and the final sample consisted of 25 companies with a high score, 25 with a middle score, and 25 with a low score. Thus, 75 companies from the OMXSLCGI, where companies with a market capitalization over 1 billion Euro are listed, was chosen for Sweden (Avanza, 2020). The same process was made for the UK, where 75 companies from the FTSE100 was collected, where the 100 largest companies in terms of market capitalization are listed for the UK. The companies used for this thesis can be seen in appendix 1 for Sweden and appendix 2 for the UK. Furthermore, both Nemetz (2015) and Lloyd (2020) have, because of the purpose of their investigations, said that companies with higher ESG scores were measured to work more with sustainability. The assumption made by Nemetz and Lloyd will be applied in this thesis.

3.3. Data Collection

3.3.1. Secondary Data

Secondary data can come in many forms; one example, is raw data, which means that there has been close to no alternations and processing of the data. Secondary data can also be compiled data, which includes data that has been received by some selection or summarization (Saunders et al., 2016). For this report, the data used is secondary data collected from the Thomson Reuter Eikon datastream, which is a form of compiled data. Secondary data will be used since the ESG score is distributed by the main rating agencies such as Thomson Reuter and Bloomberg. For the financial measures, secondary data will also be used in order to be consistent with the gathering of the values, by using

the values from Thomson Reuters it is ensured that they have been through the same process when being calculated. Thomson Reuters delivers high-quality data, which ensures high reliability. The data collected is also interpreted as panel data.

3.3.2. Procedure

The ESG scores were collected from Thomson Reuters Datastream, as well as the financial performance indicators. This datastream is used for both the Swedish and British variables.

Since Dorfleitner et al. (2015) investigated the differences between the different databases that provide ESG scores and found no significant difference between them, the data was collected from the Thomson Reuters datastream. Thomson Reuters was chosen since that database was accessible at the University and provide high-quality data.

To divide the companies into three groups of high, mid, and low scores, the Thomson Reuters ranking from 2019 was used as a guideline. However, since the scores included in this thesis are collected during the period 2015-2018, the final ranking will be based on the 2018 ESG scores. This means that companies that were, during 2019, ranked among the middle and the lower-ranked companies, had, in some cases, higher scores in 2018 than the higher ranked companies in 2019. However, the ranking presented in this thesis is based on the 2018 scores; the companies chosen are inspired by the 2019 ranking. This did not impact the results since we rearranged the companies after their ESG scores when they were all listed in the same Excel file.

The data concerning the ESG score is retrieved from the Thomson Reuters database, which is a peer-to-peer comparison, that is deigned to be as accurate as possible. The process of producing the score is divided into six main conclusions; these processes transform the data into ratings, which consists of three values for the screened companies; these are the Raw Score, Percentile Rank, and Ratings. The Raw score gives a value between 0 and 1 if they have reported at least one Key Performance Indicator (KPI) during a given year. The percentile rank is based on the raw score. The final value produced, which is used in this report, is the Ratings, which gives a value between 0 and 100, this rating is calculated by using the Environmental, Social, and Governance practices which

have been normalized and adjusted for skewness. The conclusions consist of weighting and modelling KPIs, environmental-, social- and governance practices, calculations of denominators for KPIs, and policy indicators. However, this does not weigh as heavy as the observed practices, and the final conclusion is that each KPI's weight is checked against academic literature (Thomson Reuters, 2013).

3.4. Data Analysis

3.4.1. Multiple Linear Regression Model

Regression analysis is a common tool to use for forecasting and prediction. A multiple linear regression model can be used to determine if a relationship exists between at least two or more explanatory variables. Furthermore, one of the main tasks when creating a multiple regression model is to choose the factors. The factors that were chosen was ESG score, ROA, CF, RET, and D/E ratio, because of their capacity to inform investors about the company's financial performance, where the ESG score is the dependent variable.

Osbourne and Waters (2002) explain that in a multiple regression analysis, there are four assumptions that researchers should always test. These assumptions are that the variables used are normally distributed, linearity between independent and dependent variables, reliability of the variables, and homoscedasticity (Osbourne & Waters, 2002). In the case where these assumptions are not fulfilled, the results and findings are less reliable; hence they can interfere with the results. Another assumption is that there is no multicollinearity in the multiple regression. When this assumption is not satisfied, it is difficult to estimate the impacts of the independent variables in the regression, which is why it is one of the more severe problems with the analysis of the regression (Obite et al., 2020).

3.4.2. Ordinary Least Square (OLS)

Ordinary least square (OLS) regression is a way of estimating linear regression models (Ohlson & Kim, 2014). When performing an OLS regression on panel data, this becomes a Pooled OLS regression. However, OLS cannot be used when there are outliers, which are points that are located very far away from the other observations. Neither can it be used when heteroscedasticity exists (Ohlson & Kim,

2014). Heteroscedasticity is a situation where the dependent variable has a variance that is linked to the values of the independent variables (Cai & Hayes, 2008).

Furthermore, a few remedies for heteroscedasticity are mentioned in the article by Cai and Hayes (2008), for example, WLS (weighted least squares) estimators. However, weighted least squares can only be used if the cause of the heteroscedasticity is known. If the cause for the heteroscedasticity is unknown, there is still a need to consider it. If the heteroscedasticity is not considered, it can lead to biased and inconsistent standard errors. A consequence of biased and inconsistent standard errors are incorrect t-tests (Cai & Hayes, 2008).

In order to analyse the data, five regressions will be performed, where two regressions will include all companies, and three will be performed for the individual groups, thus, contain 25 companies each. When including all the data, a Pooled OLS regression and a Fixed effect regression model (FE) will be used. For the three smaller sample groups (high-, middle- and low ESG score), a Pooled OLS will be used since these samples are too small for a FE model to be accurate.

When using a Pooled OLS regression for panel data, the results can be misleading since one assumption this regression makes is that the data is independent. This means that the OLS regression has the best effect when the individual effect (i.e., cross-sectional or time-specific effect) does not exist. In other words, this means that the variation is not isolated within the units, which could indicate that, for example, the results for the lower-ranked companies might affect the higher-rated companies. Thus, the results can be misleading.

Furthermore, when determining which regression model to use, it is crucial to choose the model that fits the data best. One indicator of how well the model fits the data is the adjusted R^2, which can be seen in the appendix 5 for Sweden with a value of 0.031461 and in appendix 8 for the UK with a value of 0.055825. Both the adjusted R^2 in the Pooled OLS regressions for the two countries are relatively low, which indicates that this model is not the most appropriate to use for this data sample.

3.4.3. Fixed Effect Model

Previous studies, such as Velte (2017) and Eccles et al. (2014), used a FE to investigate the relationship between ESG and financial performance. A FE is, according to Uchôa et al. (2014), commonly used when analysing panel data. The purpose of the FE is, therefore, to tackle the matter of omitted variable bias (Allison et al., 2017). One issue that arises when estimating variation between units, which for example, could be men and women, when using traditional statistical methods is an increased risk for omitted variable bias and heterogeneity (Hill et al., 2019; Uchôa et al. (2014). However, Hill et al. emphasize that when using a FE, the variation is kept within the units, thus with the example above within the individuals. This reduces the risk of unnoticed heteroscedasticity and omitted variable bias. The reason for the decrease in omitted variable bias under FE is because less variation appears within units than between units. Furthermore, Vaisey et al. (2016) explain that the FE is designed in a way that makes it able to clear out the estimation equation of all features, unmeasured as well as measured, that are constant within groups or over time.

However, there are some critics, like Gayle and Lambert (2014), who mean that the sample size is reduced when a sample is limited to variables that change over time. The authors continue by saying that this then leads to lower statistical power.

To determine which model to use, a diagnostics test was performed. This test resulted in the FE regression model to fit the data better for the regressions where all companies were included. Previous studies have used the FE model when analysing similar data sets, in terms of size and aim of the study. An example of a similar study that has used the FE model is Velte (2017), where 80-85 companies were analysed for four years, which resulted in a total of 412 observations. Therefore, the FE model will be used for the regression, including all companies. However, the Pooled OLS run for all companies, will be included as well, but will be used as a benchmark to see if the results differ between the FE and the Pooled OLS. For the regressions that only contain one of the three groups (low, middle, or high), the Pooled OLS was preferred, according to an additional diagnostic test. Thus, the Pooled OLS will be used for the separate groups.

When estimating the regressions, the following equation is used:

$$ESG_i = \beta_0 + \beta_1 ROA_i + \beta_2 RET_i + \beta_3 CF_i + \beta_4 DE_i + \varepsilon_i \quad (5)$$

3.5. Hypotheses

In order to determine if there is a relationship between the ESG score and financial performance in Sweden and the UK, two hypotheses were conducted for FE regression. Two different hypotheses are presented below for the Pooled regressions for the individual ranking groups (high, middle, and low). The hypotheses are based on a positivistic approach, which means that the standing point is that there is no correlation between the independent variable and the dependent variable. Thus, the hypotheses are as follows:

H1: There is no positive/negative correlation between the ESG score and any of the financial measures ROA, RET, CF, and DE for companies in Sweden during the time-period 2015-2018.

H2: There is no positive/negative correlation between the ESG score and any of the financial measures ROA, RET, CF, and DE for companies in the UK during the time-period 2015-2018.

H3: There is no positive/negative correlation between the ESG score and any of the financial measures ROA, RET, CF, and DE for companies in any of the individual ranking groups, high, mid, and low in Sweden during the time-period 2015-2018?

H4: There is no positive/negative correlation between the ESG score and any of the financial measures ROA RET, CF, and DE for companies in any of the individual ranking groups, high, mid, and low in the UK during the time-period 2015-2018?

3.6. Limitations

One important factor has been to maximize the reliability of this thesis through transparency with the help theory and data selection and analytical tests. However, some limitations and restrictions have to be considered when implementing the analysis, which will be presented in this section.

Since the data was collected from Thomson Reuters datastream, the data is limited to the data available on datastream. The companies that contained all information needed for this thesis are companies listed as large-cap. Besides, Thomson Reuters only had accessible data for the majority of the companies during a four-year period, which is a limitation regarding the long-term effects. Hence, it will not be possible to draw any significant conclusions regarding the long-run effect, nor differences between different company sizes. The data collection has further been limited because of a change in opening hours at the IT service at the university because of Covid-19. The IT services are needed in order to access the database Thomson Reuters, where data for another country would have been collected.

The first limitation concerning the multiple linear regression model used for the statistical tests is the assumptions; normal distribution, linearity, reliability, and homoscedasticity as well as multicollinearity. Since the ESG score is considered being a predictive measure, linearity could be a problem since the exact structure of the relationship cannot be determined. This means that we can neither dismiss nor confirm that linearity is a problem within these tests conducted in section 4.1. Another limitation of the multiple linear regression model is that it only takes the information that is easily measured, into account. This means that information that is not included within this category could be excluded, e.g., the culture within a company, which can affect both the ESG and the financial performance. By using the FE model, these limitations are accounted for and thus should not be a problem. A multiple linear regression model is also sensitive to outliers, which can be a limitation when running the regression. Limitations regarding the final FE regression model, which is presented in section 4.1, showed signs for heteroskedasticity for both Sweden and the UK, which indicates that the regression does not capture all the relevant information. However, when running the regressions, the model considers this through robust standard errors.

There are also limitations regarding the data sample, firstly, this report only considers four years, which means that this report does not consider the long-term effect of the relationship between the ESG score and financial performance measures. Another limitation is that this report only uses data from 2 countries, Sweden and the UK, which

both are located in Europe. Furthermore, the ESG score itself is a constraint, since different agencies use different techniques to obtain the ESG scores. Thus, the final score for the same company could differ from agency to agency. However, since Thomson Reuters is a high-quality rating agency, the findings in this thesis will be based on this data.

3.6.1. Reliability and Validity

When measuring data, there are three main biases that could occur; deliberate distortion, changes in the data collection, and a data collection method that does not fit the purpose of the topic (Saunders et al., 2016). These affect the reliability of the research. Reliability is referring to the ability to replicate the study and consistency. Thus, if someone can successfully replicate a previous research design and accomplish the same results, the method is reliable. Another vital part of any research is the term validity, which means correctness of the different measures used as well as the precision of the study (Saunders et al., 2016). The secondary data used for this report can be seen as reliable because the data is collected from Thomson Reuters, which has an influential part within the field of financial data.

4. Empirical findings

The fourth chapter presents the statistical results where the descriptive statistics are presented first, followed by the regression results obtained for Sweden and finally, the UK.

4.1. Results

4.1.1. Descriptive Statistics

***Table 1**: Descriptive statistics: Summary statistics for the Swedish variables during the period 2015-2018*

Nr of observations	300				
	ESG	ROA	RET	CF	DE
MEAN	67.2740	0.0568	0.1685	3778.00	1.2016
MEDIAN	70.3850	0.0500	0.0800	2814.50	0.5300
MINIMUM	17.0700	-0.1600	-3.0000	-305050.00	0.0000
MAXIMUM	94.2100	0.3400	1.0000	70932.00	32.8000
STD. DEV	17.4490	0.0565	0.3874	27718.00	2.6254

***Table 2**: Descriptive statistics: Summary statistics for the UK variables during the period 2015-2018*

Nr of observations	300				
	ESG	ROA	RET	CF	DE
MEAN	69.3000	0.1000	0.0150	3038.30	1.1232
MEDIAN	71.5950	0.0600	0.2600	701.2500	0.6300
MINIMUM	7.0000	-0.2300	-6.8000	-12414.00	-2.3600
MAXIMUM	95.3300	2.3700	1.0000	68959.00	24.7000
STD. DEV	15.0590	0.2666	0.7236	7663.60	1.9392

This study was conducted on 75 companies in each country, which is equivalent to 300 observations for each country. Thus, there are 600 observations in total.

For the different countries, most of the variables have similar descriptive statistics; however, for the minimum value, the UK has lower values than Sweden, except for the CF, which can be seen in Table 1 and Table 2. Other variables that differ are the median for the CF, where Sweden has higher values than the UK. The standard deviation is

another variable that differed for the CF, where Sweden also had higher values than the UK.

***Table 3**: Correlation Matrix: To detect multicollinearity for Sweden*

	ROA	RET	CF	DE
ROA	1.0000			
RET	0.2331	1.0000		
CF	0.0326	-0.1232	1.0000	
DE	-0.0923	0.1997	-0.2250	1.0000

***Table 4**: Correlation Matrix: To detect multicollinearity for the UK*

	ROA	RET	CF	DE
ROA	1,0000			
RET	0,1493	1,0000		
CF	-0,0810	-0,4665	1,0000	
DE	0,0276	-0,1136	-0,0131	1,0000

Within the formulas, two variables are including EBIT, which could imply that there is a multicollinearity problem. A correlation matrix was performed to detect a potential multicollinearity problem for the two countries. However, these found no collinearity between the independent variables for neither of the countries, which can be seen in Table 3 and 4 respectively.

4.1.2. Regression Summary

In order to conduct the OLS regression, we used the program GRETL, which stands for Gnu Regression, Econometrics, and Time-series Library. This program is, according to their official website, a software for econometric analysis, which is written in the programming language C (Gretl, 2020).

Gretle was chosen since it is a program that is specially designed for the type of data that we are using as well as its easy access.

Furthermore, five regressions will be performed in order to evaluate if there is any correlation, thus no causation between financial performance and ESG score. The

regressions that will be performed are a FE regression model and Pooled OLS for all companies, as well as three Pooled OLS regressions for each individual group (high, middle, and low).

4.1.3. OLS Regression

The regressions that were conducted for this study was four Pooled OLS regressions, including one for all companies as well as three individual regressions for the separate groups (High, mid and low), where the ESG score is the dependent variable and the financial measurements are independent variables.

When the Pooled OLS regression was performed, a panel diagnostics test was conducted. This test contains three different tests that reveal if heteroscedasticity is present and if a random effect or fixed effect model should be used. If the diagnostics test shows that a FE fits the data best, this model will be used for the regressions.

The significance level used for these tests was 0.05, and when testing for heteroskedasticity, a Breusch-Pagan test was conducted. Thus, the 0.1 significance level will not be commented on, since the 0.05 level represents more accurate results.

4.1.4. Sweden

When running a regression with panel data, the first test was the F-statistic test, which determines if a Pooled OLS model or a FE model should be used. This test for Sweden resulted in a p-value lower than the significance level of 0.05. Therefore, the null hypothesis is rejected, and a FE model should be used.

The second test is a Breush-Pagan test, which determines if a Pooled OLS model is ideal rather than a random effect model. This test determines that a random effect is more suitable than a Pooled OLS since the p-value is smaller than 0.05.

The third test is a Hausman-statistics test where the null hypothesis predicts that a random effect model is the most suitable choice. This test resulted in a p-value of 0,0498, which is very close to the significance level. However, since the p-value is smaller than 0.05, we reject H_0, and a FE model is still preferred. Because of the small difference between

the p-value and the significance level, a regression with the random effect was run as well. No significant difference was found between the results from the random effect[10] and FE model, and therefore, only the FE model results will be discussed in this thesis. This is followed by a short analysis concerning the combined Pooled OLS regression.

***Table 5**: Diagnostics test for Sweden: To determine if a Pooled effect or fixed effect model should be used*

	p-value	
F-statistics	**1.63E-96**	***
Breush-Pagan	**2.35E-77**	***
Hausman	**0.0498365**	**

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

After these three tests, it was evident that the FE model should be used. When running the FE regression, the dependent variable is the ESG score, and the independent variables are the financial performance measures, ROA, RET, CF, and DE. The previous Breush-Pagan test showed evidence of heteroskedasticity; this was accounted for when running the regression through robust standard errors.

For Sweden, the FE regression with robust standard errors shows that the CF is positively correlated with the ESG score with a p-value smaller than 0.05.

***Table 6**: Fixed effect model regression: Regression with robust standard errors for Sweden during the period 2015-2018 with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	300				
	coefficient	std. error	t-ratio	p-value	
ROA	16.8145	10.1704	1.653	**0.1025**	
RET	-1.28406	1.55043	-0.8282	**0.4102**	
CF	1.87E-05	2.71E-06	6.928	**0.0000**	***
DE	0.0236379	0.0525113	0.4501	**0.6539**	

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

The results found for the combined Pooled OLS regression was a positive correlation between ESG and CF, with a p-value smaller than 0.05. This can be seen in Table 7.

[10] These results are available by the authors upon request.

Table 7: *Combined Pooled OLS Regression: Regression for Sweden during the period 2015-2018 with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	300				
	coefficient	std. error	t-ratio	p-value	
ROA	-22.3542	18.2711	,1,223	**0.2221**	
RET	-3.0900	2.71821	-1.137	**0.2566**	
CF	0.000111	3.69E-05	3.019	**0.0028**	***
DE	0.5040	0.398207	1.266	**0.2066**	

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

To see if the results would differ between the groups of high, middle, and low ESG scores, three separate regressions were run consisting of 100 observations[11] in each test. The first separate Pooled OLS regression for the highly ranked companies for Sweden resulted in no significant relationship between the ESG score and financial performance measures. The results for the middle-ranked companies revealed a positive correlation between ESG and the independent variable CF. The lower-ranked companies had a positive correlation between ESG and DE since this variable has a p-value smaller than 0.05. The results mentioned are presented in Table 8.

[11] 25 companies for 4 years = 100 observations

***Table 8**: Separate group regressions: Regression for Sweden during the period 2015-2018 for the separate ranking groups, high, middle and low with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	100		
High	coefficient	p-value	
ROA	29.9751	0.1026	
RET	-1.79935	0.3109	
CF	4.31E-05	0.5438	
DE	0.825698	0.0999	*
Nr of observations	100		
Middle	coefficient	p-value	
ROA	-3.77993	0.7884	
RET	-2.14228	0.3432	
CF	0.000128298	0.0313	**
DE	0.206741	0.4004	
Nr of observations	100		
Low	coefficient	p-value	
ROA	15.8327	0.4212	
RET	-3.4585	0.3180	
CF	1.26143E-05	0.6996	
DE	1.34726	0.0343	**

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

4.1.5. United Kingdom

The first test, which is the diagnostic test for the UK, will reveal if a Pooled OLS model or a FE should be used. In this case, the null hypothesis is in favor of using a Pooled OLS model. The p-value is lower than the significance level of 0.05, and thus, a FE model is preferred.

The second test is a Breush-Pagan test that investigates if a Pooled OLS model (H_0) is preferred over a random effect model. The p-value is once again smaller than 0.05, and a random effect is, therefore, a better fit than a Pooled OLS.

The third test is a Hausman- statistic test, and in this test, it will be determined whether the random effect or FE is better to use. In this test, the null hypothesis consists of the random effect being preferred. The p-value is again lower than 0.05, and therefore, the FE model is ideal to use. However, the p-value is very close to 0,05.

***Table 9**: Diagnostics test for the UK: To determine if a Pooled effect or fixed effect model should be used*

	p-value	
F-statistics	**4.41E-100**	***
Breush-Pagan	**8.46E-78**	***
Hausman	**0.0464856**	**

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

The next step was to run a regression with the fixed effect model. ESG was the dependent variable, and the independent variables were ROA, RET, CF, and DE. When this regression was performed. performing this regression, heteroscedasticity was considered since the Breush-Pagan test revealed a p-value lower than the significance level. This was done through robust standard errors.

The FE regression with robust standard errors showed that none of the independent variables were significant, which can be seen in Table 10.

***Table 10**: Fixed effect model regression: Regression with robust standard error for the UK during the period 2015-2018 with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	300			
	coefficient	std. error	t-ratio	p-value
ROA	4.67185	5.17895	0.9021	**0.3699**
RET	-0.396594	0.301356	-1.316	**0.1922**
CF	-3.28E-07	3.51E-05	-0.009354	**0.9926**
DE	-0.0492709	0.0820512	-0.6005	**0.5500**

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

The combined Pooled OLS regression for the UK found a positive correlation between ESG and CF. This significant variable was not found for the FE model.

***Table 11**: Combined Pooled OLS Regression: Regression for Sweden during the period 2015-2018 with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	300			
	coefficient	std. error	t-ratio	p-value
ROA	0.90653	3.21421	0.282	**0.7781**
RET	-2.64649	1.34614	-1.966	**0.0502** *
CF	3.48E-04	1.25E-04	2.778	**0.0058** ***
DE	0.140318	0.440915	0.3182	**0.7505**

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

The Pooled OLS regression for the group of companies in the UK that were ranked with a high ESG score resulted in no significant independent variables. The same result was found for the groups with a moderate and low ESG score. These results are shown in Table 12 below.

***Table 12**: Separate group regressions: Regression for the UK during the period 2015-2018 for the separate ranking groups, high, middle and low with ESG as the dependent variable and ROA, RET, CF and DE as independent*

Nr of observations	100		
High	coefficient	p-value	
ROA	-11.9285	0.1842	
RET	-1.04961	0.1209	
CF	9.68E-05	0.0994	*
DE	0.142825	0.7725	
Nr of observations	100		
Middle	coefficient	p-value	
ROA	-0.0536955	0.9713	
RET	0.0546445	0.9651	
CF	0.000331696	0.2434	
DE	0.746247	0.0915	*
Nr of observations	100		
Low	coefficient	p-value	
ROA	-6.19875	0.7395	
RET	-5.85911	0.1158	
CF	-0.000493931	0.0987	*
DE	-0.0304993	0.9461	

*: p-value < 0.1, **: p-value < 0.05, ***: p-value < 0.01

5. Analysis & Discussion

The fifth chapter includes an analysis and discussion of the empirical findings in chapter four. The chapter starts with a summary of the regression results, followed by a comparison of the results obtained for Sweden in this thesis and previous research. This is followed by a similar comparison made for the UK results and a discussion of theories and policies.

In the empirical findings, the diagnostics tests for both Sweden and the UK determined that a FE regression fit the data best. This implies that the analysis will be based on the results from the FE regressions. However, they will be compared to the benchmark, which is the combined Pooled OLS regression.

The analyses are based on the different regressions in the empirical findings. Based on the results, we reject the null hypothesis for Sweden (H1) of no positive or negative correlation between the ESG score and the financial measurements chosen. The FE model presented a positive correlation between the ESG and CF, which could indicate that working with ESG, and receiving a higher score has a positive effect on the CF of a company. The combined Pooled OLS regression found the same result. The other null hypothesis for Sweden (H3) of no positive or negative correlation for any of the individual groups (High, mid, and low) is also rejected. When running the Pooled regressions for the high-, middle- and low-ranked companies, the same result was found for the middle-ranked companies with a positive correlation between the ESG score and CF. The regression for the lower-ranked companies resulted in a positive correlation between ESG score and DE. Thus, as the ESG score increase, DE and CF will increase as well.

Based on the regressions for the UK, we do not reject the null hypothesis (H2) of no positive or negative correlation between the ESG score and the financial measures based on the FE model. When analysing the results from the combined Pooled OLS regression, one significant variable was found. This significant variable was CF, which had a positive

correlation with ESG. The other null hypothesis for the UK (H4) of no positive or negative correlation for any of the individual groups, is not rejected (High, mid, and low).

5.1. Sweden – ESG Score and Financial Performance

The significant variables for Sweden in this thesis were CF and DE, which had positive correlations to the ESG score. These empirical findings differentiate against previous research on the correlation between ESG and financial performance measures. Both Eccles et al. (2014) and Velte (2017) found a positive correlation between highly sustainable companies and the financial measure ROA. In their studies, Eccles et al. had a sample consisting of 180 US companies between the years 1993-2010, and Velte analysed between 80-85 companies over the years 2010-2014. One possible reason for this difference can be the time-periods analysed, for example, Eccles et al. have used a longer time-period, and therefore, the long-term effects might not be shown in the regressions in this thesis. However, this is not the case for the differences with Velte's study which used a four-year period as well. When comparing the regression results in this thesis with the findings in the meta-analysis conducted by Friede et al. (2015), Friede found a positive correlation in 90% of the cases based on 2200 individual studies analysed. This result is once again different from the findings in this thesis.

Previously there has been a discussion regarding if managers have to choose between creating value or implementing ESG. Syed (2017) also states in the same section that the managers' primary focus should be on an efficient business with a strong financial and management performance. Therefore, the correlation between ESG and CF could indicate that working with ESG has a positive impact on CF. Since the components of this measure, according to Rayburn and Jennings (1986), is revenue and operating expenses, the results indicated that either a firm's revenue increases or their operating expenses decrease as the firm works more with ESG. Even though we cannot completely determine whether the revenues have increased, or the expenses decreased based on these results, Epstein and Roy (2001) argue that sustainable firms are more cost-efficient than unsustainable firms. Thus, according to these authors, ESG affects costs in a positive way. This positive correlation implies that in Sweden, based on the findings from the FE regression, the managers do not have to choose between creating value and working with ESG.

When analysing the combined Pooled OLS regression, the same result as in the FE regression was found. Thus, the results indicate a positive correlation between the CF and the ESG score. Since the same result was received for both the FE regression and combined Pooled OLS, this increases the reliability of the result.

The final three regressions analysed for Sweden concerns the individual groups of high-, middle- and low-ranked companies. Since none of the groups found a correlation between the ESG score and ROA, these findings do not support the previous research. For the highly-ranked group, no correlation was found for any of the independent variables. Thus, we can neither support nor oppose a correlation between the highly ranked Swedish group and financial performance. However, the results for the middle-ranked companies indicate a positive correlation between the CF and ESG, which is in line with the FE and combined Pooled OLS results.

Furthermore, the lower-ranked companies found a positive correlation between DE and ESG. A positive correlation between ESG and DE indicates that as companies increase their ESG, their DE also increases, which can be done by either increasing the debt or decreasing the equity. According to Bender (2014), an increase in DE indicates that the financial risk increases; thus, the business risk decreases (i.e., the companies are becoming more stable). However, it is not specified if the business risk decreases or financial risk increases. Based on the positive correlation between DE and ESG, the result indicates that as a company works more with ESG and thus receives a higher score, the business risk decreases, i.e., the risk of not receiving a profit. Therefore, the correlation with ESG implies that a company's potential to generate a profit increase. However, as business risk decreases, the financial risk within a company will increase because of the natural process within the growth stages of a firm.

Furthermore, two variables do not indicate a correlation with ESG in any of the regressions run; these are ROA and RET. Based on these results, there is no evidence to support a positive nor negative correlation between the variables and ESG. DE is correspondingly not correlated to the ESG for the high-, middle-ranked, and combined regressions.

Connecting the empirical findings from all regressions mentioned above, the significant values indicate that managers do not have to choose between creating value and ethics. However, since only one variable for each test has been significant, based on these results, it is difficult to argue that there is a correlation between ESG and financial performance as a whole. The conclusion that can be drawn is, based on the findings in this thesis, that a positive correlation exists between CF and ESG for the combined regressions and middle-ranked companies. In addition, a positive correlation is present between DE and ESG for the lower-ranked companies for Sweden.

5.2. UK – ESG score and Financial Performance

When analysing the results from the FE regression for the UK data, none of the independent variables were significantly correlated to the ESG. These findings are substantially different from previous research, as well as the results found for Sweden. The interpretation of this result indicates that there is no correlation between ESG and financial performance in the UK.

However, for the combined Pooled OLS regression, the same result was found as for the Swedish FE, combined Pooled OLS and middle-ranked companies results. Thus, the findings from the combined Pooled OLS regression for the UK indicate a positive correlation between the ESG scores and CF. This could imply that a higher commitment to ESG has a positive effect on CF. However, it is difficult to determine whether this effect is present because of a decrease in expenses or an increase in revenue, based on these results. Nevertheless, the Pooled OLS is only used as a benchmark in this thesis. Furthermore, it does not isolate the variation within the units; hence it might not give a fair indication of the impact between the variables. However, this result can be an indication of ESG having a positive impact on CF in the future since this is the case for Sweden, and for the Pooled OLS for the UK, based on the findings in this thesis.

Finally, the three separate regressions for high-, middle- and low-scored companies resulted in no significant independent variables. Thus, for the three separate regressions, it is not possible to determine a correlation between ESG score and financial performance.

Based on the findings for the UK, there is no evidence of a choice between creating value or ethics. However, because there is no correlation between the variables, there is a lack of evidence that these variables are associated with each other.

5.3. Theories and Policies

Previously in the literature review, two normative theories are presented, shareholder and stakeholder theory, which implies that they are seen as guidelines for the governance aspect within ESG (Smith, 2003). However, these theories do not take the survival of companies into account since they focus on creating value for either their shareholders or stakeholders. For companies that are struggling to survive, i.e., generate enough profit to cover their costs, these theories could possibly complicate things. A recent example of this is the pandemic, caused by Covid-19, where companies within different industries and sectors are struggling to survive. Industries that have adapted to this pandemic, and thereby increased their chances of survival, are supermarkets and restaurants. These sectors have started to offer home delivery to their customers, which then increases the environmental impact of these companies. However, this is done in order to survive. This addresses the difficulty with the combination of ESG and financial performance. Because of the lack of significant results, there is no evidence of a correlation, which could be because of the difficulty of balancing high sustainable performance and high financial performance. Part of this problem is the short-term expenses discussed by Muhmad and Muhamad (2020). These short-term costs could consist of increased production costs because of the carbon tax, among others. Thus, this could contribute to the survival dilemma, if working with ESG increases production cost and thus decrease revenues.

The policies that have been implemented by the European Commission is supposed to work as an encouragement for companies to work with ESG and sustainable finance. According to the European Commission (2018), the policies are fulfilling their purpose, and more financial institutions are more engaged in environmental actions and are developing new sustainable expansion goals. However, the European Commission also writes that the total number of financial institutions working with the policies is still fairly low since the policies are still new. However, when considering the FE regression, combined Pooled OLS, and the middle-ranked companies, the CF is positively correlated to the ESG score for Sweden. Therefore, these results indicate that

more companies will work with ESG since it, according to these findings, increases financial performance. The combined Pooled OLS for the UK found a positive correlation between the ESG scores and CF as well, which indicates the same pattern as for Sweden. Both of the countries have, among their lower-ranked companies, investment, and banking services; however, there are more of these companies in Sweden. Since this thesis found evidence of a positive correlation between ESG and CF, it could be of interest for these companies to increase their sustainable investments, which is, according to Drempetic et al. (2019), one way of reaching the sustainable development goals.

One of the recommendations provided by the HLEG through the European Commission (2018) is to invest in sustainable assets. However, there are a few issues with sustainable finance policies that are discussed by Goodhart (2008) and Schoenmaker and Wierts (2015). One of these issues is that companies avoid the regulations by moving the production to other countries with fewer regulations. Another issue is that the unsustainable assets that sustainable investors sell are being bought by other investors who see these assets as undervalued. Since approximately a third of the lower-scored companies for Sweden work with investments and assets, stricter regulations regarding sustainable assets could be beneficial from a sustainable perspective as well as an investment perspective. It could be beneficial from an investment perspective since ESG is positively correlated to CF in this study, and thus it would not have a negative impact.

Thus, there is a chance that this creates an evil circle since there is no point for a few companies to only invest in sustainable assets if other companies still buy unsustainable assets. In addition, when different countries have different regulations, which have previously been discussed, companies can shift the production to other countries where there are fewer restrictions, which then might result in a decrease of emissions in some countries but an increase in other countries. In our findings, it is evident that there are major differences between Sweden and the UK. Since Sweden had more significant variables than the UK, this could indicate that it is more profitable to work with ESG in Sweden than in the UK. Therefore, there could be a need for improvement regarding these policies. Since one of the issues concerns differences in regulations, one possible solution

could be a unified regulation system, in order to make it more profitable for more countries to work with ESG.

5.4. A Comparison Between Sweden and the UK

The two countries included in this thesis have somewhat different results based on the findings. Sweden found more significant results than the UK, which can be seen above. Since the two countries set their own regulations, which can differ, one possible reason for the difference within the results found in this thesis could be because of differences between the two countries from a government perspective. Sweden and the UK differ in both energy production and minimum wage rates. Where Sweden produce more renewable energy than the UK. Thus, there is more renewable energy available in Sweden than in the UK, and energy usage is one aspect within the environmental factor for ESG. The minimum wage rate is connected to the social aspect within ESG, and different reports show a lower minimum wage rate in the UK by approximately SEK 10,000. Because of the lower wages, the social factor could be affected negatively and lead to a reduced total ESG score for the UK.

The summary from the analysis and discussion, based on the empirical findings in this thesis, indicates that there is almost no correlation between ESG scores and financial performance. Sweden, however, has more significant variables than the UK, which only has one significant correlation between ESG and CF for the combined Pooled OLS regression, which is regarded as a benchmark. Because of the results from the diagnostic tests, the FE results and separate Pooled OLS regressions are only included when answering the research questions. However, due to the lack of significance among the dependent and independent variables for both countries, the result could indicate that these two factors do not belong together. Thus, there is no evidence that an increase in the ESG score will increase the financial performance. One potential way to increase the company's motivation to improve their ESG score could be to make it more profitable to work with ESG. Thus, addressing the short-run expenses that companies face, which is one of the issues with ESG at the moment.

6. Conclusion

The final chapter consists of four parts; the first part is answering the research questions. The second part address the practical contribution of the study, followed by the research implications of the study. Thus, the final part will present potential future research.

6.1. Answering the Research Questions

Is there a correlation between the ESG score and financial performance among the largest companies on the Swedish stock market?

The empirical findings for Sweden resulted in a positive correlation between the ESG score and CF for the FE regression, the combined Pooled OLS regression, and the middle-ranked companies. For the lower-ranked companies, a positive correlation was found between DE and the ESG. Due to the limited amount of significant results, the conclusion for Sweden is that there is no strong correlation between the ESG score and financial performance since only one variable was significant at a time.

Is there a correlation between the ESG score and financial performance for the largest companies on the British stock market?

After analysing the empirical findings regarding the UK results, no correlations were found for the FE regression, nor any of the separate Pooled OLS regressions for the high, mid- and lower-ranked companies resulted in a correlation. For the combined Pooled OLS regression, a positive correlation between the ESG and CF was found. However, the same conclusion can be drawn as for Sweden, that there is no correlation between the ESG score and financial performance, due to the lack of significant correlations for the UK.

Is there a difference between the different ranked groups of high, middle, and low ESG scores?

When running separate regressions for the different groups, Sweden had two significant independent variables. For the middle-ranked companies, a positive correlation was found between the ESG and CF. Additionally, a positive correlation between the ESG and DE was found for the lower-ranked companies in Sweden. However, for the UK, none of the separate Pooled OLS regressions indicated a correlation between ESG and the financial

measures. This indicates a difference between the two countries for both the rank as well as the independent variable being significant. However, based on these findings, neither of the countries show a strong correlation between the ESG score and financial performance since there is only one significant variable in one of the groups.

Is there any difference between the two countries Sweden and the UK?

Based on the previous research questions, a difference between the countries can be observed. On the contrary to Sweden, the UK only had one significant independent variable, CF, that was positively correlated, for the combined Pooled OLS regression. Sweden had two different significant independent variables, CF for the FE regression, combined Pooled OLS regression as well for the middle-ranked companies. Additionally, the DE had a positive correlation for the lower-ranked Swedish companies. Even though the two countries have different significant variables, the same conclusion can be drawn from the empirical findings, since only the FE model will be used to answer the research questions for the combined regressions. Thus, there is no correlation between the ESG score and financial performance measures at all for the UK, and due to the limited amount of significant variables for Sweden, no major conclusion can be drawn regarding the existence of a correlation between ESG and financial performance as a whole.

6.2. Practical Contribution of the Study

This study could be of use for European policymakers as well as for individual countries when implementing new policies regarding ESG. Because of the different findings in this study, some aspects could be of importance when making policy decisions. Since this study has limited significant results, there is almost no indication of a correlation between ESG score and financial performance, which needs to be considered when increasing taxes and other costly regulations that could negatively affect companies. This information could be valuable to avoid regulations that could have a strong negative effect on the economy in the short-run.

6.3. Research Implications

6.3.1. Theoretical Implications

The results found in this thesis contribute to implications for concepts such as sustainable finance and ESG through newer data and a new comparison to the already existing

research. This research provides results for different financial performance measures, CF, RET, and DE, which have not previously been investigated. Additionally, a comparison between the two countries Sweden and the UK was conducted. Previous research implies that sustainable firms increase their financial performance (Syed, 2017). However, this study only found one significant variable when including all companies for Sweden. Because of the limited amount of significance, the result implies that there is a limited correlation between ESG and financial performance. This result differs from the already existing research; therefore, the results from this thesis cannot support the existing theory since it is not given that there is a distinct correlation. However, the significant variable was CF, which had a positive correlation with ESG.

Furthermore, this thesis found many companies that act within the investment and banking services sector. In addition, previous research has appointed an issue regarding unsustainable assets. The unsustainable assets that are sold by some investors are bought by other investors who consider these as undervalued. This issue, combined with the findings in this thesis of an increase in CF when ESG increases, indicates that sustainable investments do not necessarily have to reduce value. Thus, stricter regulations within sustainable assets could be one solution that contributes to sustainability without jeopardizing the financial performance.

However, it is essential to remember that this thesis only found one significant variable for the combined FE results. Therefore, there are three other variables where this study did not find a correlation and cannot conclude how these variables will react to stricter regulations. Thus, it could be interesting to do further investigations on CF, DE, and the UK, since CF was significant for the Pooled OLS regression and not for the FE regression and the DE only was significant for the lower-ranked Pooled OLS. By investigating this variable and the DE further, future development over time can be studied.

6.3.2. Managerial and Ethical Implications

The practical aspects based on the empirical findings of this thesis found almost no correlation between ESG and financial performance. This shows that the previous research is not supported by the findings in this thesis, which indicates that there is almost no correlation between ESG score and financial performance. This indicates that it is not

beneficial enough to work with ESG in terms of financial performance. Thus, to increase the number of companies that are engaged in ESG, there is potentially a need for a stronger correlation between ESG and financial performance. Furthermore, it is needed to reduce the short-term costs, which is an obstacle that companies face when working with ESG. Therefore, the authors of this thesis, hope that these findings, which differ from previous research, encourage future researchers to examine this topic further. The on-going conflict between ESG and financial performance that managers face is difficult to handle because of the imbalance between value and ethics. Because of the environmental issues that become increasingly severe, ESG is an important topic that needs to be considered. However, it is equally important to consider the short-term costs that firms face before receiving the long-term benefits that previous research implies will come. This leads to a collision of a manager's primary task, which is to run their business in an efficient way (Syed, 2017) and take social responsibility. Therefore, this study could be of importance for researchers who are interested in investigating the short-term effects and relationship between ESG and financial performance.

6.4. Future Research

Potential future research could include a wider variety of company size to see if the result would be different for larger companies than for smaller companies. Since bigger companies might have more significant challenges with, for example, emissions if they have a larger production quantity, but at the same time, they might have more capital to invest in R&D to find new sustainable solutions. Another interesting aspect is to perform this test using a more extended time-period to see the development over time. This would be interesting since the countries would have had a longer time to adjust to the regulations that have been conducted by the European Commission. Besides, it could be interesting to see if more companies work with ESG now and in the future than before since global warming is a hot topic right now. This could be done if the researcher has more access to data than the data collected for this thesis. As more data becomes available throughout the years, it could also be interesting to see if what Syed (2017) claims is true, that companies that work with ESG have more potential in the long run.

It could also be interesting to look at the ESG scores provided by different agents, e.g., Thomson Reuters and Bloomberg, and see if this would give a different result. It

could also be of interest to look at the factors separately to see if only the “E” is correlated with the financial performance or only the “S” or “G” correspondingly. When separating the aspects within ESG, it could be possible to see if one factor has a larger impact on the financial measurements than the others, which could be valuable for both policymakers and managers. If the Policymakers are aware of which factor that is the most challenging for companies from an economic point of view, it might be easier for them to address the short-run issues previously discussed in this thesis. This research could also be conducted for other combinations of countries that perhaps are located on different continents to get a broader spread and an overview for the world as a whole and not just Europe and the European policies.

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Appendices

Appendix 1

75 Companies for Sweden with the corresponding ESG scores and rankings

Industry	Stockname	Company name	ESG score			
			2018	2017	2016	2015
Machinery, Tools, Heavy Vehicles, Trains & Ships	ATCOa.ST	Atlas Copco AB	94.21	93.36	86.71	88.18
Pharmaceuticals	AZN.ST	Astrazeneca AB	93.84	85.92	78.57	76.09
Machinery, Tools, Heavy Vehicles, Trains & Ships	ABB.ST	ABB AB	93.14	92.59	89.64	89.40
Metals & Mining	SSABa.ST	SSAB AB	90.33	86.05	81.79	66.11
Machinery, Tools, Heavy Vehicles, Trains & Ships	ALFA.ST	Alfa Laval AB	90.33	86.05	81.79	66.11
Homebuilding & Construction Supplies	ASSAb.ST	Assa Abloy AB	88.82	90.16	89.84	87.52
Containers & Packaging	VOLVa.ST	Volvo AB	88.57	88.81	85.48	81.67
Paper & Forest Products	SCAb.ST	Svenska Cellulosa SCA AB	87.26	84.04	76.54	84.39
Paper & Forest Products	STEa.ST	Stora Enso AB	87.17	84.71	76.52	84.33
Paper & Forest Products	STEr.ST	Stora Enso AB	86.50	82.26	83.49	81.74
Banking Services	NDASE.ST	Nordea Bank AB	86.49	82.26	83.57	81.74
Machinery, Tools, Heavy Vehicles, Trains & Ships	SAND.ST	Sandvik AB	86.40	88.85	85.15	82.77
Household Goods	HUSQb.ST	Husqvarna AB	86.40	88.85	85.15	82.77
Containers & Packaging	BILL.ST	Billerudkorsnas AB	86.18	77.86	73.11	69.68
Construction & Engineering	SKAb.ST	Skanska AB	85.75	90.22	84.85	85.97
Professional & Commercial Services	SECUb.ST	Securitas AB	85.51	77.74	81.48	82.37
Telecommunications Services	TEL2b.ST	Tele2 AB	85.46	78.15	73.11	69.41
Real Estate Operations	CAST.ST	Castellum AB	84.89	87.13	77.88	85.84
Metals & Mining	BOL.ST	Boliden AB	84.83	83.13	80.10	72.84
Household Goods	ELUXb.ST	Electrolux AB	84.66	89.08	86.98	87.55
Telecommunications Services	TELIA.ST	Telia Co AB	83.84	77.96	76.37	81.26
Communications & Networking	ERICb.ST	Telefonaktiebolaget LM Ericsson	83.81	86.96	81.03	72.94
Banking Services	SWEDa.ST	Swedbank	83.42	80.26	80.28	78.52
Machinery, Tools, Heavy Vehicles, Trains & Ships	ATCOb.ST	Atlas Copco AB	83.23	76.06	77.93	77.68
Machinery, Tools, Heavy Vehicles, Trains & Ships	SKFa.ST	AB SKF	83.18	83.10	81.77	84.79
Machinery, Tools, Heavy Vehicles, Trains & Ships	SKFb.ST	AB SKF	83.17	76.06	77.93	77.68
Food & Drug Retailing	AXFO.ST	Axfood	81.55	75.54	72.21	70.40
Software & IT Services	TIETOS.ST	Tietoenator	80.39	76.97	78.92	67.60
Metals & Mining	SSABb.ST	SSAB AB	79.98	86.06	84.46	83.81
Aerospace & Defense	SAABb.ST	Saab AB	78.17	80.58	80.10	76.52
Chemicals	NOLAb.ST	Nolato AB	77.85	74.56	77.25	79.79
Media & Publishing	MTGb.ST	MTG	77.74	76.45	76.53	61.44
Real Estate Operations	FABG.ST	Faberge AB	76.78	77.15	66.37	71.70
Food & Drug Retailing	ICAA.ST	ICA Gruppen AB	75.79	80.93	78.84	81.76
Metals & mining	LUMIN.ST	Lundin Mining AB	75.79	80.93	78.84	81.76
Machinery, Tools, Heavy Vehicles, Trains & Ships	TRELb.ST	Trelleborg AB	74.19	74.66	69.76	70.18
Telecommunications Services	TEL2a.ST	Tele2 AB	71.81	54.79	65.02	64.21
Banking Services	SHBb.ST	Svenska Handelsbanken AB	70.98	68.10	59.11	62.55
Investment Banking & Investment Services	RATOb.ST	Ratos AB	70.37	69.85	68.11	61.61
Real estate operations	HUFVa.ST	Hufvudstaden AB	70.36	74.39	75.42	75.25
Paper & Forest Products	HOLMa.ST	Holmen AB	70.36	74.39	75.42	75.25
Paper & Forest Products	HOLMb.ST	Holmen AB	68.45	63.22	63.02	59.49
Chemicals	HPOLb.ST	Hexpol	67.53	67.83	50.10	41.14
Automobiles & Auto parts	ALIVsdb.ST	Autoliv	67.10	74.27	76.85	76.84
Real estate operations	WIHL.ST	Wihlborgs Fastigheter	67.07	66.62	72.22	68.17
Consumer Cyclical	KINDsdb.ST	Kindred Group	66.89	74.52	76.74	76.84
Real estate operations	KLED.ST	Kungsleden AB	65.98	56.15	50.17	53.67
Real estate operations	BALDb.ST	Fastighetsbalder	65.49	69.04	61.83	59.81
Banking Services	INTRUM.ST	Intrum	65.47	60.44	59.57	54.17
Electronic Equipment & Parts	HEXAb.ST	Hexagon	64.48	67.18	65.17	62.45

Investment Holding Companies	LUNDb.ST	Lundbergs	62.35	61.14	57.59	53.99
Machinery, Tools, Heavy Vehicles, Trains & Ships	BEIJb.ST	Beijer Ref AB	61.91	57.82	55.62	46.92
Banking Services	SHBa.ST	Svenska Handelsbanken AB	60.90	60.86	59.67	54.31
Pharmaceuticals	SOBIV.ST	Swedish Orphan Biovitrum AB	60.65	60.86	59.55	54.31
Household Goods	ELUXb.ST	Electrolux AB	58.83	50.09	49.64	49.22
Construction & Engineering	NCCa.ST	NCC AB	58.76	50.23	49.43	49.22
Banking Services	SEBc.ST	Skandinaviska Enskilda Banken AB	58.43	48.95	53.17	52.17
Paper & Forest Products	SCAa.ST	Svenska Cellulosa SCA AB	58.07	66.08	61.83	62.56
Banking Services	SEBa.ST	Skandinaviska Enskilda Banken AB	58.07	66.08	61.83	62.56
Food & Tobacco	SWMA.ST	Swedish Match AB	57.36	55.10	56.22	46.61
Homebuilding & Construction Supplies	NOBI.ST	Nobia AB	54.95	56.96	52.33	51.93
Healthcare Equipment & Supplies	EKTAb.ST	Elekta AB	54.47	49.62	49.14	42.08
Machinery, Tools, Heavy Vehicles, Trains & Ships	VOLVb.ST	Volvo AB	54.47	49.62	49.14	42.08
Healthcare Equipment & Supplies	GETIb.ST	Getinge AB	54.31	48.81	27.76	31.50
Household Goods	HUSQa.ST	Husqvarna AB	53.67	49.64	48.80	44.43
Construction & Engineering	NCCb.ST	NCC AB	53.02	52.48	45.08	39.50
Machinery, Tools, Heavy Vehicles, Trains & Ships	NIBEb.ST	Nibe Industrier AB	53.02	52.48	45.08	39.50
Professional & Commercial Services	SECUb.ST	Securitas AB	51.86	50.40	53.05	58.92
Investment Holding Companies	KINVb.ST	Kinnevik AB	50.82	37.55	32.15	36.61
Investment Holding Companies	KINVa.ST	Kinnevik AB	50.29	44.16	45.71	37.58
Homebuilding & Construction Supplies	JM.ST	JM AB	43.17	21.56	24.85	20.00
Media & Publishing	MTGa.ST	Modern Times Group MTG AB	40.62	36.62	47.75	43.59
Communications & Networking	ERICa.ST	Telefonaktiebolaget LM Ericsson	36.37	30.83	31.90	34.75
Investment Banking & Investment Services	RATOa.ST	Ratos AB	29.11	20.13	19.92	17.07
Metals & Mining	SSABb.ST	SSAB AB	24.11	25.41	26.74	18.78

Appendix 2

75 Companies for the UK with the corresponding ESG scores and rankings

Industry	Stock name	Company	ESG score			
			2018	2017	2016	2015
Pharmaceuticals	AZN.L	Astrazeneca Ord	94,21	93,36	86,71	88,18
Beverages	CCH.L	Coca Cola HBC AG	90,11	89,23	90,15	93,24
Oil & Gas	RDSa.L	Royal Dutch Shell Ord SH A	89,25	90,49	95,33	93,55
Oil & Gas	RDSb.L	Royal Dutch Shell PLC	89,20	90,34	90,14	90,11
Containers & Packaging	MNDI.L	Mondiplcpre Ord	88,95	81,87	80,21	76,96
Beverages	DGE.L	Diageo PLC	88,87	84,81	82,68	84,45
Professional & Commercial Services	REL.L	Relx PLC Ord	88,26	90,63	91,54	89,92
Pharmaceuticals	GSK.L	Glaxosmithkline Ord	88,20	88,20	88,89	88,31
Personal & Household Products & Services	ULVR.L	Unilever Ord	87,60	86,25	86,22	86,02
Personal & Household Products & Services	RB.L	Reckitt Benckiser Group PLC	85,68	83,42	78,60	80,52
Hotels & Entertainment Services	TUIT.L	Tui AG	85,05	84,05	82,84	74,21
Construction Materials	CRH.L	CRH PLC Ord	84,14	86,70	89,04	85,49
Media & Publishing	PSON.L	Pearson PLC	84,07	83,07	83,22	73,58
Chemicals	CRDA.L	Croda Ord	83,97	74,03	69,48	68,02
Metals & Mining	BHPB.L	BHP Group PLC	83,68	85,23	85,55	84,91
Hotels & Entertainment Services	IHG.L	Intercontl Hotels Ord	83,31	86,93	77,67	79,41
Banking Services	HSBA.L	HSBC Holdings Ord	82,22	87,06	87,26	81,99
Metals & Mining	POLYP.L	Polymetal Ord	81,37	78,05	76,45	71,62
Specialty Retailers	KGF.L	Kingfisher Ord	81,10	85,82	85,90	89,13
Food & Tobacco	BATS.L	British American Tobacco Ord	80,67	73,62	71,21	71,57
Residential & Commercial REITs	SGRO.L	Segro Reit Ord	79,87	76,61	82,78	79,27
Metals & Mining	RIO.L	Rio Tinto PLC	79,38	81,83	77,27	76,59
Aerospace & Defense	BAES.L	Bae Systems Ord	79,35	82,86	76,51	81,51
Food & Drug Retailing	TSCO.L	Tesco Ord	79,17	78,67	75,54	66,21
Investment Banking & Investment Services	LGEN.L	Legal and General Group Ord	78,21	80,94	78,25	74,49

Banking Services	LLOY.L	Lloyds TSB GRP	78,20	82,12	81,47	83,51
Hotels & Entertainment Services	CPG.L	Compass Group PLC	77,62	74,56	75,88	74,58
Insurance	AV.L	Aviva PLC	77,53	76,96	76,63	82,31
Containers & Packaging	SKG.L	Smurfit Kappa Group PLC	76,85	76,67	81,44	83,49
Investment Banking & Investment Services	LSE.L	London Stock Exchange Group Ord	75,80	70,18	67,78	69,57
Professional & Commercial Services	SN.L	Smith&Nephew	75,58	75,78	71,68	59,54
Passenger Transportation Services	ICAG.L	Intl Consolidated Airlined GRP Ord	74,89	75,04	82,00	82,95
Investment Banking & Investment Services	SDR.L	Schroders Ord	74,58	72,51	62,54	65,73
Specialty Retailers	NXT.L	Next Ord	74,25	74,22	80,35	76,27
Food & Tobacco	ABF.L	Associated British Foods Ors	73,71	71,55	75,96	71,52
Insurance	RSA.L	RSA Insurance Group PLC	73,03	72,21	73,26	66,93
Water & Related Utilities	UU.L	United Utilities Group PLC	73,03	75,68	67,00	68,11
Containers & Packaging	SMDS.L	DS Smith PLC	73,03	68,08	67,75	45,30
Software & IT Services	RMV.L	Rightmove Ord	73,01	71,22	71,49	70,73
Telecommunications Services	BT.L	BT Group Ord	72,84	74,03	75,00	75,19
Media & Publishing	ITV.L	ITV Ord	72,37	69,58	67,19	62,86
Homebuilding & Construction Supplies	FERG.L	Ferguson PLC Ord	71,50	66,80	70,40	60,60
Insurance	PRU.L	Prudential Ord	71,08	76,41	72,64	73,46
Media & Publishing	WPP.L	WPP PLC	70,47	74,31	74,09	72,75
Food & Tobacco	IMB.L	Imperial Brands PLC Ord	69,80	70,21	68,52	68,92
Homebuilding & Construction Supplies	TW.L	Taylor Wimpey Ord	69,21	69,85	65,37	66,47
Aerospace & Defense	MGGT.L	Meggitt PLC	68,51	60,43	48,56	54,66
Multiline Utilities	NG.L	National Grid PLC	67,25	63,27	73,08	68,12
Electric Utilities & IPPs	SSE.L	SSE Ord	67,23	72,99	79,75	74,00
Multiline Utilities	CNA.L	Centrica PLC	66,63	67,46	69,99	75,57
Specialty Retailers	BRBY.L	Burberry Group Ord	65,94	56,85	61,62	59,49
Machinery, Tools, Heavy Vehicles, Trains & Ships	HLMA.L	Halma PLC Ord	65,89	63,73	69,68	55,84
Hotels & Entertainment Services	WTB.L	Whitebread Ord	65,89	63,73	69,68	55,84
Software & IT Services	SGE.L	Sage Group Ord	62,56	66,36	64,12	61,35
Chemicals	JMAT.L	Johnson Matthey Ord	62,45	62,23	65,45	68,20
Investment Banking & Investment Services	HRGV.L	Hargreaves LS Ord	61,35	49,67	54,98	51,96
Investment Banking & Investment Services	SJP.L	St.James's Place Ord	61,30	57,97	51,88	53,01
Water & related Utilities	SVT.L	Severn Trent Ord	60,68	67,82	64,75	59,09
Passenger Transportation Services	EZJ.L	Easyjet Ord	59,90	60,13	66,50	64,00
Machinery, Tools, Heavy Vehicles, Trains & Ships	MRON.L	Melrose Industries PLC	58,59	54,02	50,29	36,07
Insurance	ADML.L	Admiral Group Ord	58,14	62,19	54,47	51,07
Metals & Mining	EVRE.L	EVRAZ plc	57,94	53,28	46,43	52,78
Homebuilding & Construction Supplies	BKGH.L	Berkeley Group Holdings PLC	56,39	51,84	49,85	48,10
Pharmaceuticals	HIK.L	Hikma Pharmaceuticals PLC	56,24	54,89	53,87	55,81
Professional & Commercial Services	EXPN.L	Experian Ord	55,94	64,39	65,34	54,56
Machinery, Tools, Heavy Vehicles, Trains & Ships	SPX.L	Spirax-Sarco Engineering PLC Ord	55,36	48,55	47,01	48,60
Media & Publishing	INF.L	Informa PLC	52,52	50,03	49,75	53,84
Telecommunications Services	VOD.L	Vodafone Group PLC	49,65	45,91	52,84	44,90
Specialty Retailers	JD.L	JD Sports Fashn Ord	48,98	45,09	43,88	40,60
Industrial Congolomerates	SMIN.L	Smiths Group Ord	48,94	62,56	62,49	59,49
Oil & Gas	BP.L	BP PLC	46,74	49,96	42,89	43,65
Professional & Commercial Services	AHT.L	Ashtead Group Ord	44,90	50,68	50,51	52,93
Software & IT Services	AVV.L	Aveva Group Ord	42,29	44,70	49,23	47,12
Diversified Industrial Goods Wholesalers	BNZL.L	Bunzl Ord	41,86	44,86	35,76	45,94
Collective Investments	SMT.L	Scottish Mortgage Investment Trust PL	9,12	7,16	11,77	13,26

Appendix 3

Descriptive statistics for Sweden during the years 2015-2018

	Mean	Median	Minimum	Maximum
ESG	67.274	70.385	17.070	94.210
ROA	0.056800	0.050000	-0.16000	0.34000
RET	0.16850	0.080000	-3.0000	1.0000
CF	3778.0	2814.5	-3.0505e+005	70932
DE	1.2016	0.53000	0.00000	32.800

	Std. Dev.	C.V.	Skewness	Ex. kurtosis
ESG	17.449	0.25937	-0.75146	-0.087811
ROA	0.056531	0.99526	0.60198	4.1628
RET	0.38742	2.2992	-1.1468	15.032
CF	27718	7.3369	-9.1548	100.81
DE	2.6254	2.1848	7.0309	70.990

	5% perc.	95% perc.	IQ range	Missing obs.
ESG	31.912	88.848	27.285	0
ROA	-0.010000	0.15000	0.050000	0
RET	-0.19600	1.0000	0.23500	0
CF	-367.75	26660	5658.0	0
DE	0.020500	6.2045	0.57750	0

Appendix 4

Descriptive statistics for the United Kingdom during the years 2015-2018

	Mean	Median	Minimum	Maximum
ESG	69.300	71.595	7.0000	95.330
ROA	0.10000	0.060000	-0.23000	2.3700
RET	0.15030	0.26000	-6.8000	1.0000
CF	3038.3	701.25	-12414.	68959
DE	1.1232	0.63000	-2.3600	24.700

	Std. Dev.	C.V.	Skewness	Ex. kurtosis
ESG	15.059	0.21730	-0.95416	1.6143
ROA	0.26655	2.6654	7.6251	60.600
RET	0.72358	4.8142	-5.1591	39.180
CF	7663.6	2.5223	4.7421	28.862
DE	1.9392	1.7265	7.2306	75.788

	5% perc.	95% perc.	IQ range	Missing obs.
ESG	44.900	89.244	20.915	0
ROA	0.00000	0.24000	0.070000	0
RET	-0.61950	0.81900	0.51000	0
CF	0.74650	17477	1896.6	0
DE	0.020000	3.0550	1.0000	0

Appendix 5

Correlation matrix between the independent variables ROA, RET, CF and DE for Sweden during the period 2015-2018

Correlation Coefficients, using the observations 1:1 - 75:4
5% critical value (two-tailed) = 0.1133 for n = 300

ROA	RET	CF	DE	
1.0000	0.2331	0.0326	-0.0923	ROA
	1.0000	-0.1232	0.1997	RET
		1.0000	-0.2250	CF
			1.0000	DE

Appendix 6

Correlation matrix between the independent variables ROA, Retention ratio, CF and DE for the UK during the period 2015-2018

Correlation Coefficients, using the observations 1:1 - 75:4
5% critical value (two-tailed) = 0.1133 for n = 300

ROA	RET	CF	DE	
1.0000	0.1493	-0.0810	0.0276	ROA
	1.0000	-0.4665	-0.1136	RET
		1.0000	-0.0131	CF
			1.0000	DE

Appendix 7

Pooled OLS regression for Sweden with ESG as the dependent variable and ROA, RET, CF and DE as independent during the period 2015-2018

```
Model 1: Pooled OLS, using 300 observations
Included 75 cross-sectional units
Time-series length = 4
Dependent variable: ESG

              coefficient     std. error    t-ratio    p-value
  ------------------------------------------------------------
  const        68.0379         1.53100       44.44     9.63e-133 ***
  ROA         -22.3542        18.2711        -1.223     0.2221
  RET          -3.09000        2.71821       -1.137     0.2566
  CF            0.000111454    3.69175e-05    3.019     0.0028    ***
  DE            0.504000       0.398207       1.266     0.2066

Mean dependent var    67.27420   S.D. dependent var    17.44897
Sum squared resid     86991.89   S.E. of regression    17.17230
R-squared             0.044418   Adjusted R-squared    0.031461
F(4, 295)             3.428108   P-value(F)            0.009280
Log-likelihood       -1276.150   Akaike criterion      2562.299
Schwarz criterion     2580.818   Hannan-Quinn          2569.711
rho                   0.954240   Durbin-Watson         0.114353

Excluding the constant, p-value was highest for variable 5 (RET)
```

Appendix 8

Diagnostics test for Sweden

```
Diagnostics: using n = 75 cross-sectional units

Fixed effects estimator
allows for differing intercepts by cross-sectional unit

            coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------
  const      66.4363        0.687439      96.64     8.80e-183 ***
  ROA        16.8145        9.59533        1.752    0.0811    *
  RET        -1.28406       1.56428       -0.8209   0.4126
  CF          1.87469e-05   1.34682e-05    1.392    0.1653
  DE          0.0236379     0.185491       0.1274   0.8987

Residual variance: 5909.15/(300 - 79) = 26.7382

Joint significance of differing group means:
 F(74, 221) = 40.9792 with p-value 1.62679e-096
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the fixed effects alternative.)

Variance estimators:
 between = 260.904
 within = 26.7382
theta used for quasi-demeaning = 0.841947

Random effects estimator
allows for a unit-specific component to the error term

            coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------
  const      66.5994        2.00015       33.30     6.21e-102 ***
  ROA        14.0806        9.44137        1.491    0.1369
  RET        -1.49150       1.52678       -0.9769   0.3294
  CF          2.20125e-05   1.34971e-05    1.631    0.1040
  DE          0.0359155     0.183703       0.1955   0.8451


Breusch-Pagan test statistic:
 LM = 346.588 with p-value = prob(chi-square(1) > 346.588) = 2.3455e-077
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)

Hausman test statistic:
 H = 9.49566 with p-value = prob(chi-square(4) > 9.49566) = 0.0498365
(A low p-value counts against the null hypothesis that the random effects
model is consistent, in favor of the fixed effects model.)
```

Appendix 9

FE regression model corrected for Heteroskedasticity with Robust Standard Errors for the Sweden with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018

```
Model 2: Fixed-effects, using 300 observations
Included 75 cross-sectional units
Time-series length = 4
Dependent variable: ESG
Robust (HAC) standard errors

             coefficient     std. error    t-ratio     p-value
  ------------------------------------------------------------
  const       66.4363         0.613102     108.4      2.80e-083 ***
  ROA         16.8145        10.1704         1.653    0.1025
  RET         -1.28406        1.55043       -0.8282   0.4102
  CF           1.87469e-05    2.70577e-06    6.928    1.34e-09  ***
  DE           0.0236379      0.0525113      0.4501   0.6539

Mean dependent var   67.27420   S.D. dependent var   17.44897
Sum squared resid    5909.150   S.E. of regression   5.170903
LSDV R-squared       0.935090   Within R-squared     0.023666
Log-likelihood      -872.7528   Akaike criterion     1903.506
Schwarz criterion    2196.104   Hannan-Quinn         2020.604
rho                  0.045843   Durbin-Watson        1.190285

Joint test on named regressors -
  Test statistic: F(4, 74) = 13.7548
  with p-value = P(F(4, 74) > 13.7548) = 1.95943e-008

Robust test for differing group intercepts -
  Null hypothesis: The groups have a common intercept
  Test statistic: Welch F(74, 77.0) = 52.3069
  with p-value = P(F(74, 77.0) > 52.3069) = 1.75315e-045
```

Appendix 10

Pooled OLS regression for the UK with ESG as the dependent variable and ROA, RET, CF and DE as independent during the period 2015-2018

```
Model 1: Pooled OLS, using 300 observations
Included 75 cross-sectional units
Time-series length = 4
Dependent variable: ESG

             coefficient    std. error    t-ratio    p-value
  ------------------------------------------------------------
  const       68.3933        1.16055       58.93     3.21e-165 ***
  ROA          0.906530      3.21421        0.2820   0.7781
  RET         -2.64649       1.34614       -1.966    0.0502    *
  CF           0.000347758   0.000125199    2.778    0.0058    ***
  DE           0.140318      0.440915       0.3182   0.7505

Mean dependent var    69.30037   S.D. dependent var    15.05904
Sum squared resid     63163.94   S.E. of regression    14.63267
R-squared             0.068456   Adjusted R-squared    0.055825
F(4, 295)             5.419671   P-value(F)            0.000318
Log-likelihood       -1228.138   Akaike criterion      2466.275
Schwarz criterion     2484.794   Hannan-Quinn          2473.686
rho                   0.902055   Durbin-Watson         0.161315

Excluding the constant, p-value was highest for variable 4 (ROA)
```

Appendix 11

Diagnostics test for the United Kingdom

```
Diagnostics: using n = 75 cross-sectional units

Fixed effects estimator
allows for differing intercepts by cross-sectional unit

             coefficient    std. error     t-ratio     p-value
  ------------------------------------------------------------
  const      68.9491        0.757642      91.00       3.74e-177 ***
  ROA         4.67185       6.65115        0.7024     0.4832
  RET        -0.396594      0.522317      -0.7593     0.4485
  CF         -3.28217e-07   6.29916e-05   -0.005210   0.9958
  DE         -0.0492709     0.188450      -0.2615     0.7940

Residual variance: 3976.43/(300 - 79) = 17.9929

Joint significance of differing group means:
 F(74, 221) = 44.4526 with p-value 4.41306e-100
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the fixed effects alternative.)

Variance estimators:
 between = 195.17
 within = 17.9929
theta used for quasi-demeaning = 0.849905

Random effects estimator
allows for a unit-specific component to the error term

             coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------
  const      69.1390        1.73412       39.87     8.08e-121 ***
  ROA         1.85165       4.58145        0.4042   0.6864
  RET        -0.397532      0.511880      -0.7766   0.4380
  CF          2.98337e-05   6.17085e-05    0.4835   0.6291
  DE         -0.0486659     0.186696      -0.2607   0.7945


Breusch-Pagan test statistic:
 LM = 348.622 with p-value = prob(chi-square(1) > 348.622) = 8.45619e-078
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)

Hausman test statistic:
 H = 9.66394 with p-value = prob(chi-square(4) > 9.66394) = 0.0464856
(A low p-value counts against the null hypothesis that the random effects
model is consistent, in favor of the fixed effects model.)
```

Appendix 12

FE regression model corrected for Heteroskedasticity with Robust Standard Errors for the United Kingdom with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018

```
Model 2: Fixed-effects, using 300 observations
Included 75 cross-sectional units
Time-series length = 4
Dependent variable: ESG
Robust (HAC) standard errors

            coefficient    std. error     t-ratio      p-value
  ------------------------------------------------------------
  const      68.9491        0.545335      126.4        3.28e-088 ***
  ROA         4.67185       5.17895         0.9021     0.3699
  RET        -0.396594      0.301356       -1.316      0.1922
  CF         -3.28217e-07   3.50867e-05    -0.009354   0.9926
  DE         -0.0492709     0.0820512      -0.6005     0.5500

Mean dependent var   69.30037   S.D. dependent var   15.05904
Sum squared resid    3976.427   S.E. of regression   4.241802
LSDV R-squared       0.941356   Within R-squared     0.004866
Log-likelihood      -813.3350   Akaike criterion     1784.670
Schwarz criterion    2077.269   Hannan-Quinn         1901.769
rho                 -0.069333   Durbin-Watson        1.395119

Joint test on named regressors -
  Test statistic: F(4, 74) = 2.30459
  with p-value = P(F(4, 74) > 2.30459) = 0.0662092

Robust test for differing group intercepts -
  Null hypothesis: The groups have a common intercept
  Test statistic: Welch F(74, 77.0) = 61.3107
  with p-value = P(F(74, 77.0) > 61.3107) = 4.74979e-048
```

Appendix 13

Pooled OLS regression for the 25 highest ranked companies for Sweden, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018.

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

             coefficient     std. error    t-ratio    p-value
  ------------------------------------------------------------
  const      81.1524          1.22031      66.50     1.78e-081 ***
  ROA        29.9751         18.1841        1.648    0.1026
  RET        -1.79935         1.76621      -1.019    0.3109
  CF          4.30531e-05     7.06574e-05   0.6093   0.5438
  DE          0.825698        0.496935      1.662    0.0999    *

Mean dependent var   83.36580   S.D. dependent var   5.712350
Sum squared resid    3061.381   S.E. of regression   5.676712
R-squared            0.052340   Adjusted R-squared   0.012438
F(4, 95)             1.311728   P-value(F)           0.271234
Log-likelihood      -312.9664   Akaike criterion     635.9328
Schwarz criterion    648.9587   Hannan-Quinn         641.2046
rho                  0.661430   Durbin-Watson        0.631838

Excluding the constant, p-value was highest for variable 6 (CF)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 12.2293
  with p-value = P(Chi-square(14) > 12.2293) = 0.587892
```

Appendix 14

Pooled OLS regression for the 25 middle-ranked companies for Sweden, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018.

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

             coefficient     std. error    t-ratio    p-value
  ------------------------------------------------------------
  const       69.8781         1.36342      51.25     5.08e-071 ***
  ROA         -3.77993       14.0415       -0.2692   0.7884
  RET         -2.14228        2.24902      -0.9525   0.3432
  CF           0.000128298    5.87032e-05   2.186    0.0313    **
  DE           0.206741       0.244767      0.8446   0.4004

Mean dependent var   70.88470   S.D. dependent var   8.499165
Sum squared resid    6573.610   S.E. of regression   8.318407
R-squared            0.080787   Adjusted R-squared   0.042083
F(4, 95)             2.087317   P-value(F)           0.088487
Log-likelihood      -351.1763   Akaike criterion     712.3525
Schwarz criterion    725.3784   Hannan-Quinn         717.6243
rho                  0.830345   Durbin-Watson        0.455748

Excluding the constant, p-value was highest for variable 4 (ROA)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 12.7624
  with p-value = P(Chi-square(14) > 12.7624) = 0.545316
```

Appendix 15

Pooled OLS regression for the 25 lower-ranked companies for Sweden, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018.

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

              coefficient     std. error    t-ratio    p-value
  ------------------------------------------------------------
  const        47.5769         1.84549      25.78     1.13e-044 ***
  ROA         -15.8327        19.5996       -0.8078    0.4212
  RET          -3.45850        3.44499      -1.004     0.3180
  CF            1.26143e-05    3.25923e-05   0.3870    0.6996
  DE            1.34726        0.627344      2.148     0.0343    **

Mean dependent var   47.57210   S.D. dependent var   12.16009
Sum squared resid    13488.81   S.E. of regression   11.91585
R-squared            0.078565   Adjusted R-squared   0.039767
F(4, 95)             2.025001   P-value(F)           0.097076
Log-likelihood      -387.1161   Akaike criterion     784.2322
Schwarz criterion    797.2581   Hannan-Quinn         789.5040
rho                  0.881401   Durbin-Watson        0.226352

Excluding the constant, p-value was highest for variable 6 (CF)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 14.3162
  with p-value = P(Chi-square(14) > 14.3162) = 0.42643
```

Appendix 16

Pooled OLS regression for the 25 highest ranked companies for the UK, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

              coefficient    std. error    t-ratio    p-value
  ------------------------------------------------------------
  const       83.2907        1.01426       82.12     4.96e-090 ***
  ROA        -11.9285        8.91676       -1.338    0.1842
  RET         -1.04961       0.670662      -1.565    0.1209
  CF           9.67551e-05   5.81474e-05    1.664    0.0994    *
  DE           0.142825      0.492505       0.2900   0.7725

Mean dependent var   83.17070   S.D. dependent var   6.135569
Sum squared resid    3220.162   S.E. of regression   5.822065
R-squared            0.135962   Adjusted R-squared   0.099582
F(4, 95)             3.737219   P-value(F)           0.007210
Log-likelihood      -315.4947   Akaike criterion     640.9894
Schwarz criterion    654.0152   Hannan-Quinn         646.2612
rho                  0.834956   Durbin-Watson        0.455739

Excluding the constant, p-value was highest for variable 7 (DE)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 22.7798
  with p-value = P(Chi-square(14) > 22.7798) = 0.0639493
```

Appendix 17

Pooled OLS regression for the 25 middle-ranked companies for the UK, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018.

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

             coefficient    std. error    t-ratio     p-value
  ------------------------------------------------------------
  const      70.3005        0.973414      72.22      8.18e-085 ***
  ROA        -0.0536955     1.48869       -0.03607   0.9713
  RET         0.0546445     1.24412        0.04392   0.9651
  CF          0.000331696   0.000282600    1.174     0.2434
  DE          0.746247      0.437670       1.705     0.0915    *

Mean dependent var   71.72650   S.D. dependent var   6.455127
Sum squared resid    3915.969   S.E. of regression   6.420337
R-squared            0.050720   Adjusted R-squared   0.010750
F(4, 95)             1.268949   P-value(F)           0.287668
Log-likelihood      -325.2763   Akaike criterion     660.5525
Schwarz criterion    673.5784   Hannan-Quinn         665.8243
rho                  0.866883   Durbin-Watson        0.514237

Excluding the constant, p-value was highest for variable 4 (ROA)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 6.66502
  with p-value = P(Chi-square(14) > 6.66502) = 0.946855
```

Appendix 18

Pooled OLS regression for the 25 lower-ranked companies for Sweden, with ESG score as the dependent variable and financial performance measures as the independent variables for the period 2015-2018.

```
Model 1: Pooled OLS, using 100 observations
Included 25 cross-sectional units
Time-series length = 4
Dependent variable: ESG

             coefficient     std. error    t-ratio     p-value
  ------------------------------------------------------------
  const      55.9530         2.08987       26.77      4.80e-046 ***
  ROA        -6.19875       18.5850        -0.3335    0.7395
  RET        -5.85911        3.69121       -1.587     0.1158
  CF         -0.000493931    0.000296237   -1.667     0.0987    *
  DE         -0.0304993      0.449558      -0.06784   0.9461

Mean dependent var   53.00390   S.D. dependent var   11.70724
Sum squared resid    12741.89   S.E. of regression   11.58124
R-squared            0.060948   Adjusted R-squared   0.021409
F(4, 95)             1.541471   P-value(F)           0.196456
Log-likelihood      -384.2678   Akaike criterion     778.5357
Schwarz criterion    791.5615   Hannan-Quinn         783.8075
rho                  0.795322   Durbin-Watson        0.255545

Excluding the constant, p-value was highest for variable 7 (DE)

White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 42.9164
  with p-value = P(Chi-square(14) > 42.9164) = 8.83483e-005
```