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ESG and Economic Performances

From a shareholder and a stakeholder perspective
in Sweden and Norway

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Abstract

The purpose of this thesis is to investigate what impact the environment, social, and governance score (ESG) has on economic performances of Swedish and Norwegian firms. Even though Sweden and Norway are similar in many aspects and considered as two sustainable countries, there are some significant differences. For example, the largest industry in Norway is petroleum, and Sweden is a member of the European Union. In order to investigate the firms in these two countries, the research is based on public companies listed on the exchange markets in Sweden and Norway. To fulfill the purpose, two hypotheses are tested. The first hypothesis states that ESG score has no impact on economic performances of Swedish and Norwegian firms. The second hypothesis states that the impact of ESG score on economic performances is the same for Swedish and Norwegian firms. The hypotheses are tested by running multiple linear regressions with stock return and return on assets as dependent variables. The econometric analysis resulted in no significant relationship between ESG score and stock returns of the firms in the two countries. Yet, the econometric analysis resulted in a significant positive relationship between ESG score and the return on assets of firms in Sweden, but no significant relationship among the firms in Norway. These results are analyzed from a shareholder and a stakeholder perspective where the return on assets is the metric of economic performance with a stakeholder perspective. The ESG score has an impact on economic performance if stakeholders are taken into account in Sweden, but ESG scores in Norway are not proven related to economic performances at all. Due to the insignificant results, it is not possible to state that there is a difference in the impact of ESG on economic performances between the Swedish and Norwegian firms. The only difference that can be seen is that the average ESG score in Sweden is higher than it is in Norway.

Acknowledgments

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1. Introduction

In 2015, all member states of the United Nations agreed to combat climate change, prepare for its effect, and support developing countries to take action for a healthier planet (UN, 2019a). The agreement's central aim is to strengthen the countries' capability to deal with the impact of climate change and keep global warming below 2 degrees Celsius (UN, 2019a). When this agreement took place, the 17 Sustainable Development Goals was implemented and implied a commitment that each member state will work actively towards this agenda by 2030 (UN, 2019b). International organizations, governments, the business sector, individual and other non-state actors must contribute in moving towards sustainable patterns of production and consumption (UN, 2019b).

Financial systems should also contribute to sustainable development (Finansinspektionen, 2019). There are large financial information systems, like Bloomberg Finance L.P, who has access to the companies' sustainability performances through annual reports, social responsibility reports, surveys, and websites (Bloomberg Terminal, 2019). Bloomberg Terminal (2019) distributes environment, social, and governance (ESG) scores in order to range the companies' sustainability achievement. In the past ten years, the number of customers using Bloomberg ESG data has tripled (Bloomberg Finance L.P, 2019a).

Previous research analyzes the sustainability effects on different large financial markets, for example, in Europe and the United States (Rennings, Schroder, and Ziegler, 2003; Eccles, Ioannou, and Serafeim, 2014). Their research results in both significantly positive and negative, as well as no causal effect between sustainability and economic performances. Economic performances are often discussed from a shareholder perspective and are focused on stock returns (Rennings, Schroder, and Ziegler, 2003; Eccles, Ioannou, and Serafeim, 2014; Limkriangkrai, Koh, and Durand, 2017).

This bachelor's thesis aims to investigate what impact sustainability has on economic performances measured in stock return and return on assets. According to Baselli (2019) and the sustainability scores from Morningstar (2019), the northern European countries are the leaders of sustainability performance. Scandinavia has a strong, sustainable profile (Baselli, 2019), and therefore, this research aims to see what differences there are between firms in Sweden and Norway regarding sustainability related to economic performances. These are two countries with similar conditions, but with some relevant differences. Sweden is a member of the European Union, while Norway is not (European Union, 2019). Even if the countries are perceived as sustainable profiles, remember that the largest industry in Norway is petroleum with its largest export products being oil, and gas, (Regjeringen.no, 2001), and Sweden has transport and forestry as its largest industries (Carlgren, 2019).

1.1. Purpose and Hypotheses

This thesis aims to investigate the sustainability impact on economic performances of Swedish and Norwegian firms. In order to investigate this population, the samples are the listed firms on the Oslo Stock Exchange OBX Index (OBX) and the OMX Stockholm 30 Index (OMX30). The research also aims to analyze what, and if, there is a difference between the two countries.

Firms' sustainability performance is throughout this thesis measured in terms of the ESG disclosure score reported from Bloomberg Terminal (2019). In order to investigate the sustainability effect from a shareholder perspective, economic performance is measured in stock returns. The sustainability agenda by the United Nations (2019b) influences all countries and stakeholders to act in a collaborative partnership towards the goals. It is therefore also relevant to investigate the impact of ESG score on return on assets and not only return on stocks. Assets can be funded of both debt and equity holders (Berk and DeaMarzo, 2017), which also make this research related to, what Freeman, Harrison, and Wicks (2010), refers to as the Stakeholder Theory.

To fulfill the purpose, two hypotheses are tested. In order to investigate the impact of ESG scores on stock return and return on assets, the first hypothesis is statistically tested with an econometric approach through a multiple linear regression model. Further, the second hypothesis aims to analyze the different outcomes between the firms in Sweden and Norway.

Hypothesis I	Hypothesis II
H_0: ESG score has no impact on economic performances of Swedish and Norwegian firms	H_0: The impact of ESG score on economic performances is the same for Swedish and Norwegian firms.
H_1: ESG score has an impact on economic performances of Swedish and Norwegian firms	H_1: The impact of ESG score on economic performances is not the same for Swedish and Norwegian firms

1.2. Contributions to the Field

Much previous research has used the Fama and French's multiple factor model and the Capital Asset Pricing Model, and that has led to mixed results, which is presented later in this thesis. The purpose of using a multiple linear regression model in this thesis is to contribute with a new approach to the research area.

1.3. Framework

This section is followed by a background of the United Nations Sustainable Development Goals and regulations regarding sustainability in Sweden and Norway. The next chapter presents a literature review of previous research essential to this study. The literature is followed by a theoretical framework, containing a review of the Shareholder and Stakeholder Theory. The fourth chapter, the methodology, contains information about how this quantitative research is performed through eight linear regression models for each country. This section is followed by the data section that provides descriptions and calculations that are used in the econometric models in order to perform an appropriate quantitative research. After presenting the data, the empirical results are presented, followed by a discussion that integrates the results and the theoretical framework. Subsequently, the thesis is finished with a conclusion.

1.4. Background

Sweden is a member of the European Union, which implies that some decisions are made on an international level (the Government Offices of Sweden, 2019). Norway is not a member and hence all decisions are made on a national level (European Union, 2019). However, as we present below, there are no significant differences in the regulations in the two countries regarding sustainability.

1.4.1. The United Nations Sustainable Development Goals

The 2030 Agenda for sustainable development was implemented in 2015 by all the members of the United Nations (UN, 2019c). The agenda is a shared blueprint for prosperity and peace for the planet and its people, for today and future generations. The agenda is based on 17 sustainable development goals that concern poverty, health and education quality, gender equality, climate actions, and inspiration for economic growth. In order to make the 2030 Agenda reality, the ownership of the goals must be transformed into a commitment among all countries and stakeholders (UN, 2019b).

1.4.2. Sustainability Goals and Regulations in Sweden

The 2030 Agenda has become the objective when it comes to decision-making within the United Nations and for all countries in the world (Lövin and Shekarabi, 2018). Lövin and Shekarabi (2018) further explain that this implementation means a readjustment of Sweden as a modern society. They also explain that some of the goals in Sweden are to have a strategy for sustainable consumption, no green gas emissions by the year 2045, adjustments in the policy about rights for people with disabilities, and strategies that aim to strengthen the competitiveness of the industries. To fulfill these goals, the authorities and the government work with prosperity indicators and climate appendices, which should appear in the government's policy (Lövin and Shekarabi, 2018). In 2016, a legal requirement was made for corporations in Sweden to establish a sustainability report in their annual report. The report should contain information about how the company works with human rights, sustainability, employees, social responsibility, and counteracting of corruption (Sveriges Riksdag, 2016). The reporting requirement is based on an EU-directive from 2014, which encourages companies to use the guidelines from the Global Reporting Initiatives (GRI) (Ljungdahl, 2017). Firms with more than 250 employees, over 175 million SEK of assets, and a net income of at least 350 million SEK will be affected by the reporting requirement (Ljungdahl, 2017).

1.4.3. Sustainability Goals and Regulations in Norway

Norway is also committed to the 2030 Agenda. The agenda works as control principles for the Norwegian government, companies, and organizations (Norwegian Ministry of Finance and Foreign Affairs, 2018). Focus is kept on policy development, and political attention to sustainable production and consumption, education and health, employment, migration, and equality. When it comes to carbon dioxide, Norway is committed to reducing 40% of emissions by the year 2030 (Utenriksdepartementet, 2016). In 2013, the Norwegian government established a requirement that large companies need to provide information about how the business strategies include social responsibility. Already in 1998, took the Norwegian Accounting Act effect and required sustainability information in the Directors' report (GRI, 2013). GRI (2013) also states that Norway is a leader in the field of corporate sustainable responsibility, which is shown to be shared between the state and the businesses.

2. Literature Review

This section presents a review of previous studies in the field of sustainability and economic performance. Previous research uses different approaches, resulting in different conclusions. The causal relationship between sustainability factors and economic performances turn out to be both significant and insignificant for the different studies presented below.

Rennings, Schroder, and Ziegler (2003) examine the relationship between stock returns and sustainability performance in European companies. The sustainability performance is independently measured by an evaluation of environmental and social activities of a company relative to its industry, and by an evaluation of environmental and social risk within the industry. The research method includes two econometric approaches, with panel and cross-sectional data with the Capital Asset Pricing Model and Fama and French's multiple factor model. The researchers find that a sector with higher environmental performances have a significant positive effect on stock performances, while higher social performances have a less significant and negative influence. Variables of an overall sustainable performance have no significant effect. This leads to their conclusion that companies with higher environmental and social activities do not have better economic performances.

In a recent study by Giovanni and Mauro (2019), ESG scores are used to investigate abnormal returns on the Italian Exchange with the Fama and French's multiple regression model. The research results in no statistically significant evidence of ESG scores on abnormal returns. Giovanni and Mauro (2019) include control variables like EBITDA, debt/equity ratio, and total assets, which proves to be significantly causally related to abnormal returns.

Limkriangkrai, Koh, and Durand (2017) use ESG ratings to examine if there is a significant difference in stock returns among Australia's largest securities. Similarly to previous research, they use Fama and French's model to analyze the results between portfolio returns. Between all groups, differences in average returns for high and low ESG score portfolios were found. According to the authors, Australian firms with higher ESG ratings also tend to increase their leverage. Limkriangkrai et al. (2017) also investigate the ESG scores divided into its three components and find that the differences are statistically significant for the environment and governance groups. They also demonstrate that firms with high governance ratings and low environmental ratings tend to have less debt. Those firms with low governance ratings also have lower dividend payouts, and firms with high governance hold less cash (Limkriangkrai et al., 2017). Further, the researchers also find that social ratings have no impact on firms' financial decisions. Finally, their research proves no significant difference in risk-adjusted returns for portfolios based on ESG ratings and that there is no cost of ESG investments.

Derwall, Günster, Bauer, and Koedijk (2004) prove a significant positive relationship between portfolio performances and corporate eco-efficiency scores. They establish two different portfolios consisting of low respectively high ranked eco-efficient companies. By using the Capital Asset Pricing model and Fama and French, the researchers find that high ranked eco-efficient portfolios are statistically positive significant on stock performances. Overall, Derwall et al.'s (2004) findings suggest that it can be substantial to consider environmental criteria in the investment process.

Research about socially responsible investments (SRI), stock returns, and the book to market ratio is made by Galema, Plantinga, and Scholtens (2008). They use Fama and French's model to investigate the effect of SRI performances and stock returns. Further, they perform a multiple regression for the book to market ratio and SRI performance. The authors explain that they conduct this research in order to clarify the existing differences between theoretical literature and the insignificant relationship between SRI and stock returns. Galema et al. (2008) claim that many researchers control for risk and include sensitivity in stocks by using book to market ratios when using Fama and French regressions in order to analyze stock returns. They further claim that the previous literature finds no significance of these regressors. The authors conclude the opposite – that portfolios with positive scores on diversity, environment, and product have a significant impact on stock returns.

Research by Eccles, Ioannou, and Serafeim (2014) takes both shareholders and other stakeholders into account. They investigate different firms in the United States, which they divided into low and high sustainability performances based on the ESG disclosure scores from Bloomberg and Reuters. The authors claim that Reuters selects fewer data points on the disclosure, which leads to higher ESG scores than Bloomberg. Eccles et al. (2014) find that high sustainability firms display higher measurement and disclosure of non-financial information and are more long-term oriented. They also claim that these companies are more likely to have established processes for stakeholder commitment. Subsequently, Eccles et al. (2014) argue that high sustainability companies significantly outperform their counterparts over the long-term, both in terms of shareholders and accounting performance.

In conclusion, there is some previous literature on this theme. Most of them use the Fama and French model and show mixed results when investigating sustainability and economic performances.

3. Theoretical Framework

The following chapter describes the main theories applied in this thesis. The purpose of this section is to provide a foundation for discussion and analysis of the research results.

3.1. Shareholder Theory

The purpose of a company is to increase profits (Friedman, 1962). Friedman (1970) argues that the social responsibility of a company, again, is to increase profits. Zhang (2011) concludes that the emphasis on shareholders, by solely maximizing profit, leads to a short-term focus on profit with no long-term focus on development. Furthermore, Zhang (2011) explains that the lack of long-term focus brings consequences on both the company and the society. Zhang (2011) stresses that stakeholder and shareholder values are the same if companies focus on social and environmental factors in maximizing values. Focusing on those factors also lead to long-term profit maximization that brings maximized shareholder wealth (Zhang, 2011). However, many scientists, along with Friedman, do not have the same perception and claim that the two are completely separated (Freeman, 2010).

Moreover, there is the principal agency problem. In the principal and agent relationship, the principal uses the agent to perform or act in the principal's favor and best interest (Jensen and Meckling, 1976). Jensen and Meckling (1976) further explain that the problem arises when there is a conflict of interest between the agent and the principal. That could be that the agent has to act in the best interest of the principal, but that does not align with the interest or goal of the agent. When the shareholders' interest is put first and the management has to fulfill that interest, other interests are overruled, even when the other interests apply to more actors (Jensen and Meckling, 1976).

3.2. Stakeholder Theory

The Stakeholder Theory explains the importance and influence of other actors than the shareholders to a company and its performance (Freeman et al., 2010). The purpose of the Stakeholder Theory is to provide an understanding and emphasize the problems of ethics in capitalism, and to create an understanding of how ethics and organizations are related (Freeman et al., 2010). It is, however, argued what actors to acknowledge and to what extent they should be treated like stakeholders (Freeman, 1994).

The company law states that the purpose of corporations is to ensure the interest of its shareowners (Freeman, 1994). However, Freeman et al. (2010) explain that with globalization and information technology came pressure and incentives for companies to increase transparency and to take responsibility. Freeman et al. (2010) further explain that the number of influencing actors increased because the external actors that were previously overlooked were now integrated and taken into account. Freeman (1994) argues that "corporations shall be managed in the interests of its stakeholders, defined as employees, financiers, customers, employees, and communities". He further explains that Stakeholder Theory is a theory of how to raise a normative core regarding fields like feminist standpoints and ecological principles.

4. Methodology

This chapter includes a description of how the hypothetical testing statistics are performed. The purpose of the chapter is to fulfill the reader with enough knowledge to make an own assessment of the empirical result. This thesis is established on quantitative research, which, according to Patel and Davidson (2011), is described as a measurement of numerical values. They further explain that hypothetical testing statistics are used in order to test the statistical hypothesis, which is done in this thesis. The numerical values prevail data imported from Bloomberg Terminal (2019). A hypothetical-deductive method is used, where according to Patel and Davidson (2011) the empirical conclusions and hypotheses are derived from an already existing theoretical framework.

4.1. Econometric Analysis

Eight ordinary least squares (OLS) linear regression models are run in order to investigate if there is a causal relationship between the ESG score and the economic performances measured in stock return and return on assets. The assumptions for the OLS model are presented in section 4.2.

These models are implemented in Stata, which is a statistical software for data science (Stata, 2019). The models include 36 companies on the OMX Stockholm 30 Index for every year between 2007 and 2017. The same regression models are used separately for the 52 companies on the Oslo Stock Exchange OBX Index for the same time period. By using these companies as a sample, it will be possible to predict the population, which is firms in Sweden and Norway.

The first approach is to test whether the ESG score has an impact on economic performances or not. In other words, if there is a causal relationship between ESG score and stock return or return on assets. This is made by applying eight different linear regression models with 11 regressors. The models include one dependent variable, one variable of interest, and ten control variables (described in chapter 5) followed by an error term, ε. ε represents the combined effect of all unobserved variables on the outcome (Wooldridge, 2014). The β-parameters are the coefficients on each corresponding regressor. β_0 is the intercept and β_{1-11} are the average marginal effect of each regressor. These multiple regression models are based on the ordinary least squares (OLS) assumptions, which make it possible to define the causal effects, the parameters in an underlying population model, or the true model (Wooldridge, 2014). According to Wooldridge (2014), the causal effect is the outcome effect of changing the regressor by one unit while keeping the other inputs fixed. The change in the dependent variable will be an increase if $\beta > 0$ and a decrease if $\beta < 0$ (Wooldridge, 2014). The estimated coefficients are chosen in order to make the best prediction of the outcome variable given the independent regressors of the samples.

In the first four models, the stock return (R) is treated as the outcome, the dependent variable. Model (1) includes the total ESG disclosure score (ESG) as the variable of interest, followed by ten control variables (see chapter 5 for descriptions of the variables). The variables are followed by the error term. Model (2), (3), and (4) replaces the ESG disclosure score with its respective performance scores; environment (Env), social (Soc) and governance (Gov). The OLS regressions will be made separately for the OMX Stockholm 30 Index and the Oslo Stock Exchange OBX index.

$$R_{i,t} = \beta_{0,i,t} + \beta_1 ESG_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{1}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$R_{i,t} = \beta_{0,i,t} + \beta_1 Env_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{2}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$R_{i,t} = \beta_{0,i,t} + \beta_1 Soc_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{3}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$R_{i,t} = \beta_{0,i,t} + \beta_1 Gov_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{4}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

Model (5), (6), (7), and (8) includes the same variable of interest and control variables, but replaces the dependent variable with the new dependent variable return on assets (ROA).

$$ROA_{i,t} = \beta_{0,i,t} + \beta_1 ESG_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{5}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$ROA_{i,t} = \beta_{0,i,t} + \beta_1 Env_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{6}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$ROA_{i,t} = \beta_{0,i,t} + \beta_1 Soc_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{7}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

$$ROA_{i,t} = \beta_{0,i,t} + \beta_1 Gov_{i,t} + \beta_2 ASS_{i,t} + \beta_3 Eq_{i,t} + \beta_4 PB_{i,t} + \beta_5 EBITm_{i,t} + \beta_6 DbtCap_{i,t} + \beta_7 Profm_{i,t} \tag{8}$$
$$+ \beta_8 PE_{i,t} + \beta_9 SalesGr_{i,t} + \beta_{10} DPR_{i,t} + \beta_{11} Empl_{i,t} + \varepsilon_{i,t}$$

i = Security, company
t = Time period, year
R = Yearly stock return
ROA = Return on assets
ESG = ESG score
Env = Environment score
Soc = Social score
Gov = Governance score
Ass = Total assets
Eq = Total equity
PB = Price to book ratio, P/B ratio
EBITm = EBIT margin
DbtCap = Debt to capital ratio
Profm = Profit margin
PE = Price to earning ratio, P/E ratio
SalesGr = Sales growth
DPR = Dividend payout ratio
Empl = Number of employees

4.2. Statistical Properties of the OLS Estimator

The purpose of running an OLS regression is to estimate the coefficients in order to observe the causal effects (Wooldridge, 2014). In order to conduct a correct OLS regression, some assumptions are made. Wooldridge (2014) refers to these as multiple linear regression assumptions (MLR) under which the OLS estimators are unbiased for the true model and are presented below. To increase reliability, some of the most relevant assumption are tested, while the others are still assumed to be satisfied.

The first assumption, MLR-1, is the linear assumption which defines the regression model (Wooldridge, 2014). By conducting a scatterplot for the models, the assumption is assumed to be satisfied since no deviation is observed.

The second assumption, MLR-2, is the random sampling assumption (Wooldridge, 2014). To learn about a population, the random sample needs to be large enough to represent the population, which MLR-6 implies. In order to make the sample large enough, 36 and 52 firms over a ten-year period are used. Consequently, this results in two large samples of 360 and 520 observations, respectively, which is a large sample, according to Lantz (2015). With this sample, it is possible to make a statement about the firms in Sweden and Norway.

The third assumption, MLR-3, implies no perfect collinearity (Wooldridge, 2014). That means that there is no variable that is dependent on the other. The assumption rules out relationships among the variables. It does allow the independent variables to be correlated but not perfectly correlated (Wooldridge, 2014). For example, this is the reason why the ESG score is divided into its respective performance scores. Otherwise, this might cause a multicollinearity problem, which occurs when the independent variables are correlated. This causes problems when interpreting the results (Wooldridge, 2014). The correlation matrix of the independent regressors can be found in appendix I. Since there is no high correlation among the variables, the assumption can be assumed to be satisfied.

The fourth assumption, MLR-4, is the exogeneity assumption that says that the regressors are exogenous (Wooldridge, 2014). The unobserved component, ε, and the regressors are independent, which means that their covariance is zero.

The fifth assumption, MLR-5, is the homoscedasticity assumption, which implies that the variance of the unobserved component is independent of the regressors (Wooldridge, 2014). The error term has the same, constant, variance given any value of the independent variables. This means that the regressors are not informative about the variability of the outcome due to the unobserved component. This assumption is an evolvement of the exogeneity assumption by counting for the variability (Wooldridge, 2014). If the assumption does not hold, the error term is heteroscedastic. In order to correct for the violated homoscedastic assumption, the standard errors can be replaced with heteroscedastic-robust standard errors (Stock and Watson, 2015). This research includes robust standard errors since some of the models are heteroscedastic, seen in appendix II.

The final assumption, MLR-6, denotes that the sample is normally distributed (Wooldridge, 2014). According to Stock and Watson (2015), the sample needs to be large in order to be approximately normally distributed around the mean and its variance. As described in MLR-2, this sample can be assumed to be normal due to the 360 respectively 520 observations for Sweden and Norway respectively. The time period of 2007 and 2017 was chosen due to special circumstances that might affect the outcome. For example, there is data before and after the financial crisis in 2008 and data before and after the implementation of the United Nations 17 Sustainable Development Goals conducted in 2015 (UN, 2019c). The sample is normally distributed when MLR-1 to MLR-4 are satisfied, which also implies that the OLS estimators are unbiased of the true model (Wooldridge, 2014). A histogram of the normal distribution for this study's regression models can be found in appendix III where the normality can be assumed.

4.3. Awareness and Restrictions

Including too many regressors in a multiple linear regression model is often a result of nervousness about biases that might arise by regressions according to Wooldridge (2014). He further refers to this as over-controlling for factors in multiple regressions. Before the correct model for this research was stated, there was more control variables included in the regressions, and due to multicollinearity, these variables are excluded.

The data section contains a review about how the ESG score is calculated and divided into the three performances, which in turn can be divided into its different sustainability metrics (seen in the data section 5.3). Due to the lack of data on many of the metrics, these scores are not considered in the regression models. If all the detailed sustainability metrics were used, too many companies would have been excluded, which would reduce the number of observations and violate the randomness and the normal distribution of the model. It could also lead to the problem with over-controlling.

4.4. Testing Hypothesis I

In order to make a definite statement about the true causal effect, a statistical testing method is used. In the introduction section of the thesis, the two null hypotheses are stated. The first null hypothesis, "ESG score has no impact on economic performances of Swedish and Norwegian firms", is a statement about the true model that eventually can be disproved or proved. Wooldridge (2014) claims that if the null hypothesis can be disproved, its negation is true, which means that the null hypothesis can be rejected and the regressor is statistically significant. If the alternative hypothesis in this thesis is true, it will imply that ESG has an impact on the economic performances of Swedish and Norwegian firms. If it is not possible to reject the null hypothesis, implying that the regressor is insignificant, there is nothing to be learned about the model. If the test manages to disprove the null hypothesis, it admits a small probability of incorrectly rejecting the null hypothesis, which is called a type-1 error, according to Wooldridge (2014). In Stata, the software tests for joint significance between the regressors, and if the test rejects, the variables are jointly significant. By computing the corresponding p-value, Wooldridge (2014) claims that it is possible to see if the null hypothesis can be rejected or not. Further, he states that the p-values are compared with the correct significance or probability level and if the p-value is smaller than the significance level, the test rejects.

4.5. Testing Hypothesis II

Recall the second null hypothesis, "The impact of ESG score on economic performances is the same for Swedish and Norwegian firms". In order to reject this null hypothesis, a comparison between the regression results is made. The method of this approach is solely to compare how the empirical results from the linear regression differ between the two countries. The null hypothesis can be rejected if there is any difference in the results. Also, the mean and the number of observations will be discussed in order to compare the possible differences. The mean scores are statistically tested with a *t-test: Two-sample Assuming Unequal Variances* in order to test if the mean of the ESG score of the two countries are equal. Summary statistics and the t-test can be found in table Ia–Ib and table II in section 6.1.

5. Data

This chapter provides a description of how the data is collected from Bloomberg Terminal, an information platform that is based on global information from Bloomberg L.P, established in 1981 (Bloomberg Finance L.P, 2019b). Bloomberg delivers business and financial information, news, and insights to customers around the world (Bloomberg Finance L.P, 2019b). In this thesis, data about the Swedish OMX30 companies and Norwegian OBX companies have been collected from Bloomberg and then transferred into Excel. The OMX30 and OBX were chosen to represent the two countries because those stocks are the most traded and are available on the public market.

5.1. Data from Bloomberg

The companies analyzed in this thesis is based on the OMX Stockholm 30 Index (OMX30) consisting of the 30 most actively traded stocks on the Stockholm exchange and is a market-weighted price index. The thesis is also based on the Oslo Stock Exchange OBX Index (OBX), which is a capitalization-weighted index of the largest companies traded on the Oslo stock exchange (Bloomberg Terminal, 2019). In order to get a randomized sample, the range of the data is from the year 2007 to 2017, which results in 36 companies on OMX30 and 52 companies on OBX. Some observations have not been analyzed due to unreported data. Descriptions, calculations, and field IDs for the analyses can be found with Bloomberg's FLDS function. By using the correct code for each variable of interest, the data was transferred into Excel for every correct ticker (the letter that identify a company's security) for each year between 2007 and 2017.

5.2. Dependent Variables

To investigate the impact ESG score has on economic performances, two dependent variables are examined. In order to study sustainability from a shareholder perspective, the stock return is used. The ratio is based on a security's last price for each year, P_t, collected from Bloomberg Terminal (2019). To calculate the yearly return on the security, R_t, the following formula is used:

$$R_t = \frac{P_t - P_{t-1}}{P_t} \qquad\qquad (A)$$

The second dependent variable, return on assets (ROA), investigates the results from a stakeholder perspective according to the Stakeholders Theory by Freeman et al. (2010). Berk and DeMarzo (2017) explain return on asset as an operating ratio, calculated as net income plus interest expenses divided by the book value of assets. An increase in the firm's payables and receivables will increase total assets and lower the return on asset. By calculating return on assets, investors and other stakeholders can see how efficient a firm's managers are at investing in order to generate earnings. The interest expenses are included because the assets can be funded both by equity and debt investors. Interest expenses are excluded in the income statement and are therefore added in order to measure the correct performance ratio (Berk and DeMarzo, 2017).

$$ROA = \frac{Net\ Income\ +\ Interest\ Expense}{Book\ Value\ of\ Assets} \qquad\qquad (B)$$

5.3. Variable of Interest

The aim of the thesis is to analyze what impact the ESG score has on the economic performances of Swedish and Norwegian firms. The yearly environment, social, and governance (ESG) scores used in this thesis are Bloomberg ESG disclosure scores. ESG provides an overview of firms' environmental, social, and governance performances (Bloomberg Finance L.P, 2019c). Bloomberg has become one of the fastest and most credible digital information sources in the financial industry (Nath, 2019). The scores are based on information the companies publish in annual and corporate social responsibility reports, surveys, and their websites (Bloomberg Terminal, 2019). The information is made into comparable metrics by Bloomberg Finance L.P (2019c). The ESG points are presented as a percentage of total possible disclosure score across the ESG fields available on Bloomberg and range from 0.1 to 100 (Bloomberg Terminal, 2019).

Companies' ESG scores can be disclosed with the total score (ESG) or the environmental, social, and governance scores separately (Bloomberg Finance L.P, 2019c). Each score can be further divided into more precise metrics. The metrics that are used to calculate a company's ESG score are adjusted based on the industry of the company to make the score as relevant as possible. However, the metrics for governance are the same for all industries. The social and environmental impact metrics are divided into subgroups with high, medium, and low impact presented below (Bloomberg Finance L.P, 2019c).

Environment		
High impact industries: Medium impact industries: Low impact industries:	Materials, Industrials, Energy, Utilities Consumer Discretionary, Consumer Staples Communications, Financials, Health Care, Technology	
Metrics for environmental impact:	GHG/Revenue Energy/Revenue Water/Revenue	Waste/Revenue Water Recycled % SOx/Revenue NOx/Revenue
Social		
High impact industries: Low impact industries:	Materials, Industrials, Energy, Utilities, Consumer Staples Consumer Discretionary, Communications, Financials, Health Care, Technology	
Metrics for Social (safety) impact:	Women Employees to Management Ratio Women Employees % Employee Turnover %	Employees Unionized % Lost Time Incident Rate Total Incident Rate Fatalities/1000 Employees
Governance		
Metrics for Governance impact	Percentage of independent directors Percentage of board members that are women Average age of directors	Directors meeting attendance in percentage Board size - number of directors on board

5.4. Control Variables

In order to make a correct analysis of the ESG scores, the research need to include control variables. These are variables that are related to the total stock return and the firms' return on assets. From Bloomberg Terminal (2019), the following data were progressed:

- **Total Assets**

Total assets, current assets and long-term assets include the company's cash, inventory, property, equipment, and other investments that are made (Berk and DeMarzo, 2017). These are listed in the balance sheet or the statement of financial position. Total assets should be equal to the company's total liabilities and shareholders' equity.

- **Total Equity**

Total equity is an accounting measure of the net worth of the firm, the book value of equity or shareholders equity (Berk and DeMarzo, 2017). It is not unusual that the book value of equity differs from the market value of equity. The market value of a stock depends on what the investors think that the assets will produce in the future. The market value is similar to the yearly return on the stocks, and therefore will the model only control for the total equity.

- **Price to Book ratio, P/B ratio**

Price to book ratio, also known as the market to book ratio, is the relation between the market value and the book value of the shareholders' equity (Berk and DeMarzo, 2017). If the price to book ratio exceeds one, it indicates that the value of the company's assets, when they are put in use, are higher than the historical costs. Most successful firms have a price to book ratio over one. The differences in firms' characteristics lead to a variation in the ratio.

- **EBIT margin**

An important profitability ratio is the EBIT (earnings before interests and taxes) margin. The EBIT margin can be used to see how efficient the firm is compared to other firms in the same industry (Berk and DeMarzo, 2017).

$$EBIT\ margin = \frac{EBIT}{Sales} \tag{C}$$

- **Debt to Capital ratio**

The dept to capital ratio gives information about a firm's leverage. According to Berk and DeMarzo (2017), this shows the fraction of the firm financed by debt.

$$Debt\ to\ Capital\ ratio = \frac{Total\ Debt}{Total\ Equity + Total\ Debt} \tag{D}$$

- **Profit margin**

Another profitability ratio that will be controlled for is the profit margin, which shows the portion of each krona or dollar in revenue that is available to the equity holders (Berk and DeMarzo, 2017). Comparing profit margin between companies shows the differences in efficiency and leverage.

$$Profit\ margin = \frac{Net\ Income}{Sales} \tag{E}$$

- **Price to Earnings ratio, P/E ratio**

The price to earnings ratio is the most common ratio to evaluate the market value of the firm (Berk and DeMarzo, 2017). It shows the value of equity to the firm's earnings, on a total basis or a price-per-share basis. It is a simple measure to investigate if the stock is overvalued or undervalued. For example, a price to earnings ratio of ten, shows that investors are willing to pay ten times the firm's earnings to purchase a share. The risk of a firm can affect the ratio. If all else equal, the higher risk, the lower is the price to earnings ratio.

$$P/_E\ ratio\ = \frac{Market\ Capitalization}{Net\ Income} = \frac{Share\ Price}{Earnings\ per\ Share} \tag{F}$$

- **Sales Growth**

The sales growth shows the revenue growth per year (Bloomberg Terminal, 2019). It is calculated as a percentage decrease or increase in sales revenue by comparing the current period with the same period last year.

$$Sales\ Growth\ = \frac{Revenue\ from\ Current\ Period - Revenue\ from\ Same\ Period\ Prior\ Year * 100}{Revenue\ from\ Same\ Period\ Prior\ Year} \tag{G}$$

- **Dividend Payout ratio**

The dividend payout ratio is a simple measurement of a firm's growth (Berk and DeMarzo, 2017). The dividend payout ratio is the fraction of the firm's earnings that it pays in dividends each year. By increasing this ratio, the firm can increase its dividend.

- **Number of employees**

The number of people employed by the company based on full-time equivalents (Bloomberg Terminal, 2019).

6. Empirical Results and Discussion

The following chapter begins with a summary of the observations and the variables for the OMX Stockholm 30 Index securities and the Oslo Stock Exchange OBX Index securities. The summary statistic is followed by the test results and discussion of the first hypothesis and subsequently of the second hypothesis. Recall, that the aim of this thesis is to investigate what relationship sustainability, in terms of the ESG score, has on economic performances and if there are any differences in the relationship for the firms in Sweden and Norway.

6.1. Summary Statistics

In order to make a statement about the differences between Sweden and Norway, a statistical t-test is made, and is presented below. The low p-value, P(T<=t), indicates that there is a significant difference of the mean between the two countries. The correlation between the ESG score and its underlying performance scores are also presented below and shows that the variables correlates with each other, and therefore, need to be separated in different regression models.

Table Ia presents a description of the observations of the OMX Stockholm 30 Index securities (OMX30) between 2007 and 2017. In this time period, there are 360 observations that contain an ESG disclosure score, resulting in a mean of 41.5 points. As seen below, the average stock return is 13.4%, and the average return on assets is 5.9%. The number of observations varies due to missing data of the variables. For example, it is only 339 observations that include data on environment scores, compared to social and governance that can be found in 360 observations.

Table Ib presents a description of the observations of the Oslo Stock Exchange OBX Index securities (OBX) between the same time period, 2007 – 2017. During this time, there are 356 observations that contain an ESG score, resulting in a mean of 27.3 points. The average return on stocks is 14.2% and return on assets is on average 2.6%. Also, similarly to OMX30, the number of observations for OBX decrease when testing the underlying ESG performances. Only 261 observations include the environmental score compared to 356 observations that have data on ESG score. There are 454 observations that have information about stock returns.

The average overall ESG score in the world is 24.9 points and the country with the highest ESG score is France, with an average of 46.9 points (Jang, 2019). Remember that this thesis is based on the samples of the largest exchange markets and not on the total score of the two countries.

Table Ia and Table Ib - Summary Statistics

Table Ia - Sweden	Mean	Std. Dev.	Obs
Return	13.403	96.144	373
Return on Asset	5.898	14.247	371
ESG	41.513	13.306	360
Environment	35.855	16.946	339
Social	43.170	12.893	360
Governance	56.905	8.754	360
Total Assets	293.478	630.841	373
Total Equity	44.004	49.809	373
Price to Book	5.110	20.496	315
EBIT margin	8.395	30.452	314
Debt to Capital	21.651	73.234	373
Profit margin	10.445	59.615	370
Price to Earnings	26.465	86.682	307
Sales Growth	14.221	134.270	366
Dividend Payout ratio	72.055	133.237	332
Employees	43.606	54.646	367

Table Ib - Norway			
Return	14.207	73.094	454
Return on Asset	2.576	12.974	497
ESG	27.309	15.760	356
Environment	25.341	15.633	261
Social	35.602	15.234	295
Governance	44.728	13.723	356
Asset	79.433	334.417	503
Equity	12.119	26.516	503
Price to Book	2.728	7.234	434
EBIT margin	-0.250	83.270	461
Debt to Capital	8.062	293.159	499
Profit margin	-4.203	66.775	499
Price to Earnings	40.920	283.586	356
Sales Growth	14.553	67.205	491
Dividend Payout ratio	179.467	1716.160	342
Employees	5.798	8.603	464

Table II - T-test Two sample Assuming Unequal Variances

	ESG OMX30	ESG OBX
Mean	41.513	27.309
Variance	177.043	248.365
Observations	360	356
t-stat	13.024	
P(T<=t) two-tail	0.000	
t Critical two-tail	1.963	

Table III - Correlations between the ESG score and its underlying performance scores

OMX30	ESG	Environment	Social	Governance
ESG	1.000			
Environment	0.965	1.000		
Social	0.783	0.637	1.000	
Governance	0.660	0.515	0.493	1.000
OBX				
ESG	1.000			
Environment	0.969	1.000		
Social	0.834	0.749	1.000	
Governance	0.735	0.614	0.439	1.000

6.2. Empirical Results - Hypothesis I

The first approach is to test if there is a causal relationship between the ESG score and the return on stocks or assets. This part of the empirical research will firstly explain the results of companies on the Swedish OMX30 exchange, followed by the results of the companies on the Norwegian OBX exchange.

6.2.1. OMX Stockholm 30 Index Securities - The Impact of ESG on Stock Return in Sweden

After running a multiple linear regression on OMX30 with the total ESG score as the variable of interest, the results show no significant relationship between ESG score and stock returns, seen in Table IV, model (1). The only variables that show any significance on a 10% probability level are the EBIT margin and the price to earnings ratio. Sales growth is significant on a 1% significance level. The EBIT margin is shown to have a negative impact on stock returns, but the price to earnings ratio and the sales growth has a positive impact.

To further investigate the sustainability effect on stock return, the ESG score has been divided into its three performance scores, environment, social and governance, also seen in Table IV, model (2) – (4). Again, these sustainability factors show no significant effect on stock return on OMX30 in Sweden. Since there is no significant causal relationship, nothing can be learned from these regressions. ESG score has no proven impact on the stock return of Swedish firms.

Table IV - The impact of ESG on stock return (R) in Sweden

	(1) Change in R	(2) Change in R	(3) Change in R	(4) Change in R
ESG	0.228 (0.54)			
Environment		0.206 (0.61)		
Social			0.229 (0.60)	
Governance				0.038 (0.07)
Total Assets	-0.005 (-0.06)	0.000 (-0.00)	-0.004 (-0.05)	-0.003 (-0.04)
Total Equity	-0.068 (-0.34)	-0.104 (-0.64)	-0.060 (-0.30)	-0.054 (-0.27)
Price to Book	0.108 (1.41)	-0.038 (-0.37)	0.120 (1.62)	0.124 (1.56)
EBIT margin	-1.101* (-1.67)	0.248 (0.31)	-1.109* (-1.69)	-1.117 (-1.63)
Debt to Capital	-0.098 (-1.71)	0.007 (0.09)	-0.098 (-1.20)	-0.105 (-1.19)
Profit margin	0.477 (0.72)	0.200 (0.30)	0.462 (0.70)	0.430 (0.64)
Price to Earnings	0.230* (1.71)	0.339 (1.45)	0.232* (1.71)	0.213 (1.46)
Sales Growth	1.254*** (13.80)	-0.344 (-1.08)	1.250*** (14.08)	1.246*** (13.25)
Dividend Payout ratio	-0.119 (-1.61)	-0.190 (-1.50)	-0.120 (-1.62)	-0.111 (-1.41)
Employees	-0.056 (-1.10)	0.001 (0.03)	-0.064 (-1.40)	-0.067 (-1.42)
Constant	16.214 (0.67)	10.351 (0.44)	15.817 (0.65)	24.040 (0.65)
Observations	213	218	218	218
R-squared	0.7914	0.0458	0.7914	0.7910
Period	2007-2017	2007-2017	2007-2017	2007-2017

1. t- values are in parenthesis

2. *, **,*** denotes a significance at the 0.10, 0.05, and 0.01 level or better

6.2.2. OMX Stockholm 30 Index Securities - The Impact of ESG on Return on Assets in Sweden

In Table V, the same regression models are used, but the stock return is replaced with the return on assets. The causal relationship between ESG scores and return on assets (5) is statistically significant on a 5% significance level. The coefficient on ESG score is a value of 0.058, which indicates that for every point the ESG increases, return on assets increases with 0.058 percentage points on average. Compared with the previous model with stock return, more control variables show a significant impact on return on assets. Total equity, debt to capital ratio, and sales growth have negative impacts on return on assets on a significance level of 1%, 1%, and 5%, respectively. Price to book ratio, EBIT margin, profit margin, and the number of employees are positive related to return on assets on a significance level of 5%, 10%, 1%, and 1% respectively.

When dividing ESG score into its underlying performance score, the social score (7) shows no significance. The environment score (6), shows a positive causal relationship with return on assets on a significance level of 5%. The coefficient on the environment score is 0.039, which implies that for every increase of environment points, the return on assets increases by 0.039 percentage points on average. Also, the governance score (8) has a positive impact. On a 10 % significant level, the coefficient states that for every point the governance score increases, return on assets will increase by 0.081 percentage points in average. These results indicate that the null hypothesis can be rejected, implying that ESG score has an impact on the return on assets of Swedish firms.

Table V - The impact of ESG on return on assets (ROA) in Sweden

	(5) Change in ROA	(6) Change in ROA	(7) Change in ROA	(8) Change in ROA
ESG	0.058** (2.58)			
Environment		0.039** (2.44)		
Social			0.000 (-0.02)	
Governance				0.081* (1.73)
Total Assets	0.011 (1.28)	0.010 (1.39)	0.012 (1.31)	0.014* (1.78)
Total Equity	-0.082*** (-3.19)	-0.077*** (-3.84)	-0.077*** (-2.90)	-0.087*** (-3.68)
Price to Book	0.050** (2.49)	0.065*** (3.06)	0.054*** (2.66)	0.055*** (2.73)
EBIT margin	0.214* (1.87)	0.056* (0.51)	0.212* (1.82)	0.194 (1.60)
Debt to Capital	-0.090*** (-7.54)	-0.104*** (-9.40)	-0.092*** (-7.95)	-0.089*** (-7.16)
Profit margin	0.506*** (2.89)	0.552*** (2.92)	0.493*** (2.82)	0.510*** (2.95)
Price to Earnings	-0.020 (-1.11)	-0.023 (-0.96)	-0.025 (-1.32)	-0.020 (-1.03)
Sales Growth	-0.025** (-2.34)	0.141*** (2.69)	-0.027*** (-2.62)	-0.025** (-2.26)
Dividend Payout ratio	0.009 (0.98)	0.012 (1.00)	0.012 (1.20)	0.009 (0.87)
Employees	0.021*** (4.23)	0.016*** (3.35)	0.018*** (3.68)	0.019*** (4.03)
Constant	1.192 (0.71)	3.479** (2.45)	3.709* (1.71)	-0.749 (-0.31)
Observations	219	214	219	219
R-squared	0.7410	0.7794	0.7367	0.7403
Period	2007-2017	2007-2017	2007-2017	2007-2017

1. t- values are in parenthesis

2. *, **,*** denotes a significance at the 0.10, 0.05, and 0.01 level or better

6.2.3. Oslo Stock Exchange OBX Index Securities - The Impact of ESG on Stock Return in Norway

Table VI shows that the ESG score (1) is not statistically significant on stock returns on the Norwegian exchange. Differently, from the OMX30 exchange, total assets, equity, and price to book ratio are the only statistically significant variables. Total equity and price to book ratio have a positive impact on stock returns, while total assets have a negative impact. Like before, Table VI also shows the ESG score divided into its three underlying scores. environment score (2) is statistically significant on a 10% significance level and has a negative impact on stock returns. If the environment score increases by one point, stock return decreases with 0.501 percentage points on average. Also, social score (3) is significant on a 5% level and has a negative impact on stock returns. If social score increases with one point, stock return decreases with 0.78 percentage points on average. The governance score (4) is not statistically significant. Since the ESG score has no proven impact on the stock return of the firms in Norway, similar to the Swedish firms, the null hypothesis cannot be rejected.

Table VI - The impact of ESG on stock return (R) in Norway

	(1) Change in R	(2) Change in R	(3) Change in R	(4) Change in R
ESG	-0.378			
	(-1.32)			
Environment		-0.501*		
		(-1.77)		
Social			-0.780**	
			(-2.45)	
Governance				0.055
				(0.19)
Total Assets	-0.365**	-0.423**	-0.461**	-0.284*
	(-2.27)	(-2.24)	(-2.36)	(-1.76)
Total Equity	0.670**	0.863**	0.866**	0.474
	(2.06)	(2.29)	(2.29)	(1.48)
Price to Book	6.118***	6.298**	6.885***	6.192***
	(3.83)	(2.45)	(2.84)	(3.75)
EBIT margin	0.069	0.532**	0.483*	0.074
	(0.30)	(2.20)	(1.93)	(0.35)
Debt to Capital	-0.042	-0.126	-0.087	-0.058
	(-0.52)	(-0.95)	(-0.61)	(-0.72)
Profit margin	-0.198	-0.817**	-0.657*	-0.162
	(-0.65)	(-2.27)	(-1.84)	(-0.58)
Price to Earnings	0.014	0.014	0.080	0.012
	(1.62)	(0.14)	(0.68)	(1.49)
Sales Growth	-0.049	-0.134	-0.167	-0.037
	(-1.40)	(-0.91)	(-0.94)	(-1.03)
Dividend Payout ratio	-0.002	0.100*	0.092	-0.001
	(-1.15)	(1.66)	(1.58)	(-0.83)
Employees	0.413	0.088	0.308	0.107
	(0.66)	(0.14)	(0.47)	(0.17)
Constant	14.463	11.541	25.502	3.256
	(1.01)	(0.59)	(1.27)	(0.17)
Observations	194	149	152	194
R-squared	0.1033	0.1331	0.1442	0.0964
Period	2007-2017	2007-2017	2007-2017	2007-2017

1. t- values are in parenthesis

2. *, **,*** denotes a significance at the 0.10, 0.05, and 0.01 level or better

6.2.4. Oslo Stock Exchange OBX Index Securities - The Impact of ESG on Return on Assets in Norway

In Table VII, the dependent variable is now replaced with return on assets. On the OBX exchange, ESG score (5) shows no significant result and is therefore not causally related to return on assets. The same insignificant result is found when the regression models are divided into the underlying ESG performances (6) – (8). Overall, with return on assets as the dependent variable, these models seem to be more reliable since the control variables are shown to be more casually related to return on assets than to stock returns. In conclusion, ESG score has no proven impact on return on assets of the Norwegian firms, and the null hypothesis can, therefore, not be rejected.

Table VII - The impact of ESG on return on assets (ROA) in Norway

	(5) Change in ROA	(6) Change in ROA	(7) Change in ROA	(8) Change in ROA
ESG	-0.005 (-0.23)			
Environment		-0.003 (-0.13)		
Social			-0.006 (-0.28)	
Governance				0.010 (0.43)
Total Assets	-0.011 (-0.65)	0.014 (1.00)	0.016 (1.09)	-0.008 (-0.49)
Total Equity	0.001 (0.03)	-0.044 (-1.59)	-0.046* (-1.66)	-0.005 (-0.17)
Price to Book	0.480** (2.26)	0.450** (2.07)	0.426** (2.03)	0.485** (2.26)
EBIT margin	-0.049 (-1.21)	-0.088*** (-2.60)	-0.088*** (-2.66)	-0.049 (-1.19)
Debt to Capital	-0.027* (-1.80)	-0.064*** (-5.43)	-0.065*** (-5.62)	-0.027* (-1.83)
Profit margin	0.283*** (5.93)	0.277*** (7.23)	0.275*** (7.35)	0.284*** (5.90)
Price to Earnings	-0.003 (-1.22)	-0.048*** (5.30)	-0.048*** (-5.85)	-0.003 (-1.25)
Sales Growth	-0.003 (-0.93)	0.057*** (3.78)	0.056*** (3.82)	-0.003 (-0.88)
Dividend Payout ratio	0.000 (0.52)	-0.001 (-0.32)	-0.001 (-0.35)	0.000 (0.55)
Employees	0.012 (0.26)	-0.018 (-0.44)	-0.020 (-0.48)	0.002 (0.05)
Constant	4.641*** -4.03	7.233*** -5.77	7.489*** -5.94	4.109*** -2.94
Observations	196	151	154	196
R-squared	0.5496	0.6926	0.6954	0.5498
Period	2007-2017	2007-2017	2007-2017	2007-2017

1. t- values are in parenthesis

2. *, **,*** denotes a significance at the 0.10, 0.05, and 0.01 level or better

6.3. Discussion - Hypothesis I

The null hypothesis cannot be rejected for any of the exchange markets when stock return is used as the dependent variable and ESG score as the variable of interest. Hence, the ESG score has no proven impact on the stock return of Swedish and Norwegian firms and nothing can be learned from these regressions. Similar results were found in the research by Renning et al. (2003) on the European exchange market, and Giovanni and Mauro (2019) on the Italian exchange market. Their studies show no significant relationship between sustainability and economic performances. The only difference from these previous studies to the research in this study is that on the Norwegian OBX exchange, the environment and social scores show a significant negative relationship with stock return. These negative results indicate that when companies improve their performance related to environment and social performance, the stock return will decrease. Zhang (2019) claims that the focus on the social and environmental factors will lead to a long-term profit maximation that brings maximized shareholder wealth. His statement cannot be found with the significant results for firms in Norway, the results are even slightly the opposite. Since the stock return is proven to decrease when the environment and social factors are reported for firms in Norway, this might be more related to what Jensen and Meckling (1976) refer to as a principal agency problem. Jensen and Meckling (1976) explain that this is a problem that arises when there is a conflict of interest between the agent and the principal. If a Norwegian company (the agent) invests in these sustainable resources, it will increase costs in the short-term, which is not in the shareholders' interests (the principal).

The outcome for Swedish firms changes if the stock return is replaced with the return on assets. On the Swedish OMX30, there is a positive causal relationship between the ESG score and return on assets. Also, the environment and governance scores are positive and statistically significant. Therefore, for OMX30, the null hypothesis can be rejected when the return on assets is used as a dependent variable, implying that ESG score has an impact on the return on assets of Swedish firms. Eccles et al. (2014), also found similar evidence, implying that high sustainability companies outperform their counterparts both in terms of shareholders and accounting performances. They further imply that these companies are more likely to have established a stakeholder commitment. Return on assets is, as described in the data section 5.2, the net income plus interest expenses divided by the book value of assets (Berk and DeMarzo 2017). Since assets can be funded of both equity and debt investors, return on assets is closer related to sustainability than stock return is. According to Freeman et al. (2010) stakeholders integrate more actors of a company than just the shareholders, and it may be the reason of why ESG score on the OMX30 resulted in evidence of a causal effect on return on assets. The Stakeholder Theory provides an understanding and emphasizes the problems of ethics in capitalism and how ethics are related to the corporation (Freeman et al. 2010), and Bloomberg Terminal (2019) measure these factors in the ESG scores. The higher the ESG score, the more does the company seem to care about these ethics. Higher sustainability performance is also discussed in the research by Eccles et al. (2014) and Zhang (2011) who claim that high sustainable firms tend to be more long-term oriented and have established processes for stakeholder commitment. The commitment to stakeholders might be the reason why also the underlying sustainability performances environment and social scores

among the Swedish firms, have a positive impact on return on assets. Suppliers and customers might have concerns regarding how the firms act environmentally, which can affect profitability and can lead to an increase in return on assets. Swedish regulations might influence the governance performance within the companies, which in turn, also can increase profitability for the stakeholders. The research of Limkiangkrai et al. (2017) shows that ESG scores have no proven significant effect on the Australian stock returns but lead to a positive impact on firms leverage and a decrease in debts. Their research is similar to the findings of the Swedish firms, no proven effect on stock return but on return on assets that is related to all of the stakeholders, not only the shareholders. Also, Zhang (2011) further explains that if companies consider sustainability aspects, the values of stakeholders and shareholders are the same. Nevertheless, many scientists, according to Freeman et al. (2010), perceive that the Shareholder and the Stakeholder Theory are two completely separate approaches.

On the OBX exchange, no significant causal relationship can be found even if the stock return is replaced with the return on assets. ESG score has no proven impact on the return on assets of Norwegian firms. The insignificant result does not imply that there is no impact; it only indicates that nothing is learned from the econometric analysis.

6.4. Empirical Results - Hypothesis II

The second hypothesis, "the impact of ESG score on economic performances is the same for Swedish and Norwegian firms," is not tested through a regression model. This examination is based on a comparison of the results when testing for the first hypothesis. Since many of the regressions are insignificant is not possible to make any conclusions about the differences between the outcomes in the two countries. While the environment and social scores have a significant impact on stock return on the OBX exchange, the OMX30 exchange shows no statistical significance. The contrary appears when the dependent variable is replaced with the return on assets. Then, the OMX30's ESG, environment, and governance scores are causally related with return on assets while the OBX's ESG score and its underlying performance scores are not statistically related.

Studying the summary statistics (section 6.1.), it is statistically proven, with the t-test in table II, that there is a difference between average ESG scores. On the OMX30, 360 observations contain information about ESG score, resulting in a mean score of 41.5 points. While on the OBX, there are 356 observations, resulting in a mean score of 27.3 points. After dividing the ESG scores into its different performance scores, the number of observations decreases. 339, 360 and 360 observations are reported with an environment, social and governance score respectively for the OMX30 exchange while the observations decrease to 261, 295 and 356 observations on the same respectively score on the OBX exchange.

In summary, with the evidence above, there is a difference on the ESG scores between the firms in Sweden and Norway but there is no proven difference in the impact of ESG score on economic performances. Hence, it is not to possible to reject the second null hypothesis.

6.5. Discussion - Hypothesis II

There is a difference between the mean score of ESG on the OMX30 and the OBX exchange, presented in table Ia and Ib in section 6.1. The scores on Bloomberg Terminal (2019) are based on what companies report themselves, which determines what data is available. Both Sweden and Norway have similar regulations and are both committed to the United Nations 2030 Agenda (Lövin and Shekarabi, 2018; Utenriksdepartementet, 2016). However, Swedish firms have higher ESG score on average, even if Norwegian firms were required to report their sustainability performance before Swedish firms (GRI, 2013). That Swedish firms have higher ESG scores than Norway may be due to the differences in industries between the countries. Norway's largest industry is petroleum, and major export products are oil and gas (Regjeringen.no, 2001), while Sweden's largest industries consist of transport and forestry (Carlgren, 2019). The Swedish membership of the European Union might also affect the way the Swedish firms report sustainability performances, which can lead to higher ESG scores.

The regression output, in table V, indicates that Swedish stakeholders care about sustainable aspects, measured in terms of ESG score. In table VII, however, the regression output does not significantly indicate that there is such interest of the stakeholders in Norway. Hence, nothing can be learned from the output in table VII. It is plausible that Swedish stakeholders pressure the Swedish companies to be more transparent on how they perform on these aspects. This, in turn, may encourage the companies to perform sustainably better. Hence it is not possible to make any conclusion about such pressure on Norwegian companies since the result is insignificant.

7. Conclusion

The purpose of the thesis is to investigate the sustainability impact on economic performances of Swedish and Norwegian firms, and to analyze what, and if, there is a difference between the two countries. When investigating the impact of the ESG score on economic performances, it turns out that only return on assets among the Swedish firms is proven related to the total ESG sustainability rating.

The return on assets is perceived as an economic performance that applies to stakeholders. Therefore, it is plausible that the return on assets is more influenced by how well the firm performs sustainably than what the stock return is, since the return on stocks only concerns the shareholders. Only among the Swedish firms do the ESG, environment and governance scores have an impact on return on assets, while not on stock return. Investigating return on assets among the Swedish firms leads to the conclusion that the alternative hypothesis can be stated; ESG score has an impact on economic performance (return on assets) of Swedish firms. Regarding the stock return, the insignificant results leads to the conclusion that the null hypothesis cannot be rejected. Among the firms in Norway, there is no proven impact between ESG score and economic performances. However, keep in mind that the insignificant results only imply that the regression models cannot disclose anything. Hence, implying that shareholders and stakeholders do not care about sustainability is not plausible. Moreover, the underlying environment and social scores show a negative, significant impact on stock return. The negative impact might be due to a principal agency problem since it might not be in the shareholders' interest to invest in sustainable development. In summary, the insignificant impact of the total ESG score and economic performances of Norwegian firms leads to the conclusion that the null hypothesis cannot be rejected.

Both Sweden and Norway are committed to the United Nations 2030 Agenda and are considered as two sustainable profiles (Baselli, 2019). However, the sustainable effect does not clearly show in the regression outputs. The regressions do not prove that there is a difference in the impact of the ESG score between Sweden and Norway, even with similar regulations in the two countries. The only differences that can be observed between the two countries, is that the points of ESG score differs, Swedish firms tend to have a higher ESG score than Norwegian firms. Since there is no significant relationship between the total ESG score and stock return among the firms in Sweden and Norway, nothing can be learned from that regression model. The insignificance may be considered a weakness of this research. For future research, a different method can be used. For example, it would be possible to provide grouped portfolios and analyze them through another model. Many previous studies have used the Fama and French or Capital Asset Pricing model. However, keep in mind, that previous studies with these two methods, also, have shown an insignificant result between sustainability and stock return (Rennings, Schroder, and Ziegler, 2003; Giovanni and Mauro, 2019; Limkriangkrai et al., 2017). To provide another perspective to the research, it would be possible to conduct quantitative research instead, based on interviews among firms, and further investigate the regulatory differences between the countries. Testing an Instrument Variable regression would also contribute with a new approach on the research.

8. References

Books

Berk, J., and DeMarzo, P. 2017. *Corporate Finance.* 4th ed. Essex: Pearson Education Limited.

Friedman, M., 1962. *Capitalism and freedom.* Chicago: University of Chicago Press.

Friedman, M., 1970. *The Social Responsibility of Business Is to Increase Its Profits.* In: W.C

Lantz, B. 2015. *Operativ Verksamhetsstyrning.* 5th ed. Studentlitteratur AB

Patel, R., and Davidson, B. 2011. *Forskningsmetodikens grunder. Att planera, genomföra och rapportera en undersökning.* 4th. Lund: Studentlitteratur AB.

Stock, J, H,. and Watson, M, W,. 2015. *Introduction to econometrics.* 3rd ed. Essex: Pearson Education Limited.

Wooldridge, J, M. 2014. *Introduction to econometrics.* 5th ed. Hampshire: Cengage Learning

Zimmerli, M. Holzinger, M. Richter, eds. 2007.*Corporate Ethics and Corporate Governance.*, Berlin, Heidelberg: Springer. Pp 173-178.

Articles

Derwall, J., Günster, N.K., Bauer, R., and Koedijk, C.G. 2004. The Eco-Efficiency Premium Puzzle. *ERIM Report Series Research in Management*.

Freeman, R.E., 1994. The Politics of Stakeholder Theory: Some Future Directions. *Business Ethics Quarterly*, Volume 4, Issue 4.

Freeman, RE, Harrison, JS, and Wicks, AC 2010, Stakeholder Theory: The State of the Art, *Cambridge University Press,* Cambridge. Available at: ProQuest Ebook Central

Galema, R., Plantinga, A., and Scholtens, B. 2008. The stocks at stake: Return and risk in socially responsible investment. *Journal of Banking & Finance* [e-journal] 32(12), pp. 2646-2654.

Giovanni, L., Mauro, S. 2019. Towards a more ethical market: the impact of ESG rating on corporate financial performance. *Social Responsibility Journal*. [e-journal] 15(1), pp.11-27,

Jensen, M.C., Meckling, W.H., 1976. *Theory of the Firm: Manegerial Behavior, Agency Costs and Owenship Structure.* Journal of Financial Economics, 3, pp 305-360.

Limkriangkrai, M., Koh, S. and Durand R, B. 2017. Environmental, Social, and Governance (ESG) Profiles, Stock Returns, and Financial Policy: Australian Evidence* *International Review of Finance*, [e-journal] 17(3). pp. 461–471.

Rennings,K., Schroder, M., and Ziegler, A. (2003). The Economic Performance of European Stock Corporations: Does Sustainability Matter?* *Greener Management International*. [e-journal] (44). pp. 33-43.

Zhang, Y, 2011. *The Analysis of Shareholder Theory and Stakeholder Theory*. 2011 Fourth International Conference on Business Intelligence and Financial Engineering, pp 90-92.

WEBB

Bloomberg Finance L.P, 2019a. *ESG data.* [Online] Bloomberg Finance L.P. Available at: < https://www.bloomberg.com/impact/products/esg-data/ > [Accessed 14 May 2019].

Bloomberg Finance L.P, 2019b. *About Bloomberg, We are the central nervous system of global finance.* [Online] Available at: < https://www.bloomberg.com/company/ > [Accessed 23 April 2019].

Bloomberg Finance L.P, 2019c. *Environmental, Social & Governance Analysis (ESG).* [pdf] Bloomberg Finance L.P. Available at: Bloomberg Terminal [Accessed 23 April 2019].

Bloomberg Terminal (Bloomberg Finance L.P), 2019. Bloomberg Terminal [Accessed 23 April 2019].

Carlgren, F. 2019. *Industriproduktionens sammansättning.* [Online] Available at: < https://www.ekonomifakta.se/fakta/ekonomi/produktion-och-investeringar/industriproduktionens-sammansattning/ > [Accessed 6 June 2019].

European Union 2019. *Countries.* [Online] Available at: < https://europa.eu/european-union/about-eu/countries_en?fbclid=IwAR1ziASiNu73GMnaeMloHDiE4c1aExkzTiJ254PA7W9l9IJWBXvZSlznVu4 >

Finansinspektionen, 2019. *Miljö och Hållbarhet.* [Online] Available at: < https://www.finansinspektionen.se/sv/finansiell-stabilitet/miljo-och-hallbarhet2/ > [Accessed May 28 2019].

Government Offices of Sweden. 2019. *Sweden in the EU.* [Online] Available at: < https://www.government.se/sweden-in-the-eu/ > [Accessed June 6 2019].

GRI. 2019. *GRI Standards.* [Online] Available at: < https://www.globalreporting.org/standards > [Accessed 19 May 2019].

GRI. 2013. *Regulating for a more sustainable future: New Norwegian CSR regulation entered into force.* [Online] Available at: <https://www.globalreporting.org/information/news-and-press-center/Pages/Regulating-for-a-more-sustainable-future-New-Norwegian-CSR-regulation-entered-into-force.aspx > [Accessed 19 May 2019].

Investopedia. Nath, I, T. (2019). *Bloomberg vs. Reuters: What's the difference?* [Online] Available at: <https://www.investopedia.com/articles/investing/052815/financial-news-comparison-bloomberg-vs-reuters.asp > [Accessed 23 April 2019].

Jang, E. 2019. *ESG Coverage Map.* [PDF] Bloomberg Finance L.P. Available at: Bloomberg Terminal [Accessed 07 June 2019].

Morningstar. Baselli, V. 2019. *Sustainable Countries: Northern Europe Leads the Pack in ESG Practices.* [Online] Available at: < https://www.morningstar.com/blog/2019/04/15/global-esg.html > [Accessed 14 May 2019].

Norwegian Ministry of Finance Norwegian Ministry of Foreign Affairs. 2018. *One Year Closer 2018.* Oslo: Ministry of Foreign Affairs.

PWC, Ljungdahl, F. 2016. *Lagstadgad hållbarhetsrapport från 2017.* [Online] Available at: <https://www.pwc.se/sv/publikationer/finansiell-rapportering/lagstadgad-hallbarhetsrapport-fran-2017.html > [Accessed 19 May 2019].

Regjeringen.no 2001. *Business and industry in Norway – The structure of the Norwegian economy.* [Online] Available at: < https://www.regjeringen.no/no/dokumenter/Business-and-industry-in-Norway---The-structure-of-the-Norwegian-economy/id419326/#Sentrale > [Accessed 6 June 2019]

Regeringskansliet, Lövin, I., and Shekarabi, A. 2018. *Agenda 2030 visar vägen till en hållbar värld!* [Online] Available at: < https://www.regeringen.se/debattartiklar/2018/06/agenda-2030-visar-vagen-till-en-hallbar-varld/ > [Accessed 19 May 2019].

StataCorp LLC, 2019. *Stata software.* [Online] Available at: < https://www.stata.com > [Accessed 1 May 2019].

Sveriges Riksdag 2016. *Företagens rapportering om hållbarhet och mångfaldspolicy.* [Online] Available at: <https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/foretagens-rapportering-om-hallbarhet-och_H401CU2 > [Accessed 19 May 2019].

United Nations Framework Convention on Climate Change, UN, 2019a. *The Paris Agreement.* [Online] Available at < https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement > [Accessed 28 May 2019]

United Nations, UN, 2019b. *Transforming our world: the 2030 Agenda for Sustainable Development.* [Online] Available at < https://sustainabledevelopment.un.org/post2015/transformingourworld > [Accessed 14 May 2019]

United Nations, UN, 2019c. *The Sustainable Development Agenda.* [Online] Available at: <https://www.un.org/sustainabledevelopment/development-agenda/ >[Accessed 1 May 2019].

Utenriksdepartementet 2016. *Norges oppfølging av FNs bærekraftsmål (sammendrag av rapport).* [Online] Available at: <https://www.regjeringen.no/no/dokumentarkiv/regjeringen-solberg/andre-dokumenter/ud/2016/rapport_bkm/id2505390/ > [Accessed 19 May 2019].

9. Appendix

Appendix I, MLR-3: No Perfect Collinearity

OMX30	ESG	Total Assets	Total Equity	Price to Book	EBIT Margin	Debt to Capital	Profit margin	Price to earnings	Sales Growth	Dividend Payout ratio	Employees
ESG	1,00										
Total Assets	0.259	1,00									
Total Equity	0.3045	0.8862	1,00								
Price to Book	0.037	0.1431	0.1613	1,00							
EBIT Margin	0.0862	0.223	0.109	0.3288	1,00						
Debt to Capital	0.0371	0.0397	0.0726	0.0737	0.1366	1,00					
Profit margin	0.0496	0.1498	0.0311	0.2738	0.6931	0.1636	1,00				
Price to earnings	0.008	0.0157	0.0074	0.0185	0.1411	0.0274	0.1219	1,00			
Sales Growth	0.1499	0.0931	0.093	0.0775	0.2088	0.8425	0.1792	0.0007	1,00		
Dividend Payout ratio	0.0829	0.0661	0.0797	0.0068	0.1951	0.0238	0.0593	0.9313	0.0747	1,00	
Employees	0.1351	0.2067	0.1528	0.0908	0.3453	0.041	0.2929	0.0402	0.0586	0,00	1,00
OBX											
ESG	1,00										
Total Assets	0.5114	1,00									
Total Equity	0.5424	0.9517	1,00								
Price to Book	0.2214	0.1473	0.1779	1,00							
EBIT Margin	0.1898	0.1419	0.167	0.0475	1,00						
Debt to Capital	0.1166	0.0801	0.0276	0.1555	0.1119	1,00					
Profit margin	0.2248	0.2049	0.1892	0.0415	0.7025	0.0438	1,00				
Price to earnings	0.0831	0.0021	0.0069	0.0348	0.2848	0.0118	0.0925	1,00			
Sales Growth	0.1941	0.0163	0.0495	0.4556	0.0253	0.1032	0.005	0.0546	1,00		
Dividend Payout ratio	0.1022	0.002	0.0005	0.0388	0.24	0.0449	0.0873	0.9057	0.0026	1,00	
Employees	0.5682	0.8778	0.8218	0.176	0.237	0.0786	0.2633	0.0476	0.0114	-0.0531	1,00

Appendix II, MLR-5: Test for Heteroscedasticity

| OMX30	Cameron & Trivedi	Breusch-Pagan/Cook-Weisberg
(1) Regression with stock return and ESG	0.887	0.482
(5) Regression with return on assets and ESG	0.000	0.000
OBX		
(1) Regression with stock return and ESG	0.999	0.381
(5) Regression with return on assets and ESG	0.000	0.000

Test for heteroscedasticity after predicting the residuals.
The numbers indicate the p-values of the two heteroscedasticity tests by Cameron and Trivedi and Breusch-Pagan/Cook-Weisberg. A higher p-value indicates that the homoscedasticity assumption is met. Since there are some low p-values, this assumption is violated. Therefore, this thesis uses robust standards errors in the regression models in order to correct for heteroscedasticity.
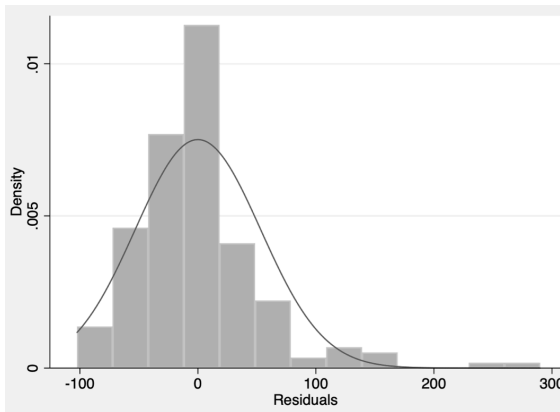
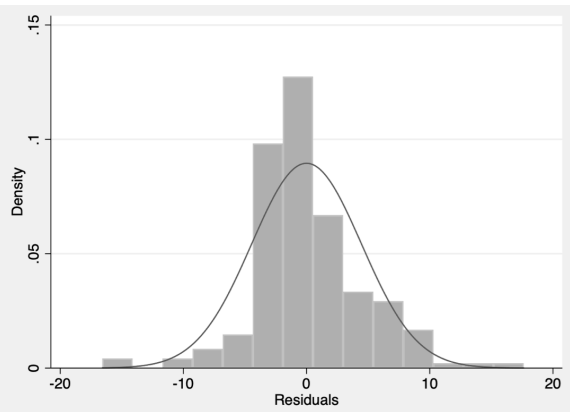## **Appendix III, MLR-6: Normal Distribution Histogram**
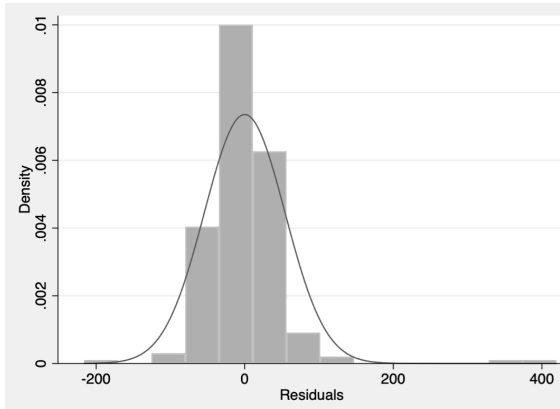
Normal distributions of regression model (1) in Sweden, stock return and ESG score
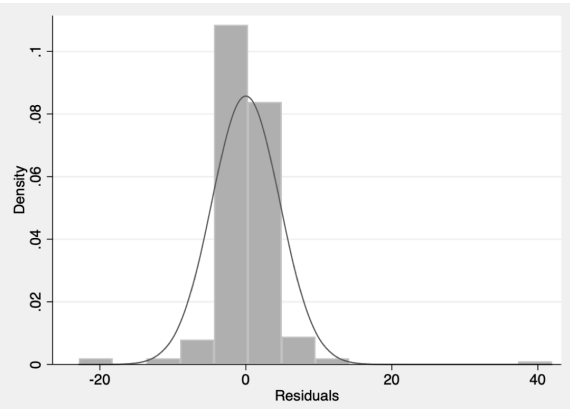
Normal distributions of regression model (5) in Sweden, return on assets and ESG score

Normal distributions of regression model (1) in Norway, stock return and ESG score

Normal distributions of regression model (5) in Norway, return on assets and ESG score