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RELATIONSHIP BETWEEN ESG AND PERFORMANCE OF LISTED COMPANIES IN OMX OSLO 2012-2021

Bachelor's thesis

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ABSTRACT

Sustainability has become an increasingly important issue in recent years, with individuals, organizations, and governments recognizing the urgent need to address the world's environmental, social, and economic challenges. The trend of sustainability can be seen in the growing number of companies and governments actively implementing sustainability policies and practices in their operations. Norway has been know for their oil industy yet Norway has been making new sustainability implementations in the past years and has reached high honors in sustainability rankings. There are not many studies about if sustainability implementations have been adopted by the companies listed in OMX Oslo and if the implementations have relationship to company performance. Therefore this thesis provides an overview of does ESG scores have relationship with company performance in Norway.

This thesis aims to analyse the relationship between ESG scores and the financial performance of listed companies in OMX Oslo from 2012 to 2021. This thesis evaluated 91 companies from OMX Oslo and the data was collected from Bloomberg Terminal. To gain more comprehensive results from this study, sub-components E, S and G are used in regression models. A panel data model was conducted with individual models of subcomponents of ESG as well as a combined model with performance variables Return On Assets (ROA), Tobin’s Q and Return On Equity (ROE). The results from the conducted models demonstrated no significant relationship between ESG disclosure scores and company performance, indicating that ESG metrics do not strongly influence company performance in OMX Oslo.

Keywords: Norway, Sustainable finance, Panel data, ESG

INTRODUCTION

Sustainability is a topic that affects people's lives in everyday decisions, whether going to grocery stores and buying ethically grown food or opting to use low-emission transportation. These decisions and overall consumer awareness have pushed companies and governments to react to the ongoing climate issues. Norway is no exception to this transition since a majority of companies state that sustainability is integrated into all of their products, and less than one-fourth of companies have differing views on that statement (Sustainability Hub 2021). Different metrics have been created to provide more information and transparency on sustainability for consumers and investors. ESG has become the most widely used metric for sustainability. Independent companies have created their metrics to create global ESG databases that can be used to determine the level of socially responsible behaviour of the organization. The most well-known ESG metrics providers are MSCI, Thompson Reuters and Bloomberg, which is used in this thesis.

ESG has gained much popularity in previous years, and ESG has been defined in various ways. However, Robeco (2023) has defined ESG as: "ESG means using Environmental, Social and Governance factors to evaluate companies and countries on how far advanced they are with sustainability. Once enough data has been acquired on these three metrics, they can be integrated into the investment process" (Robeco, 2023). ESG has become a staple in the investing circles. Morgan Stanley (2001) stated that during 2020 equity funds in the United States that are focused on sustainability outperformed traditional equity funds by 4.3 %, which indicates the importance of ESG implementations.

Norway being one of the largest oil suppliers in the world and simultaneously ranked as the most sustainable country in the world, shows the efforts that the Norwegian government has made in the past years. Norway has pledged to follow the Paris Agreement reducing emissions by 50% by 2030 and achieving net zero carbon emissions by the year 2050 (Norwegian Ministry of Climate and Environment, 2021). Norway has also implemented a transparency act that gives the general public and investors access to how companies manage their employees (David M et al., 2023). These efforts can be seen in listed companies since companies are also aligning their operations with the Paris Agreement and trying to achieve more sustainable operations. Even Equinor, the largest oil company in Norway, has aligned itself with the Paris Agreement aiming to reduce its emissions 50% by 2030 (Equinor, 2022). With even companies such as Equinor trying to transition their

operations to focusing more on sustainability, the topic of this thesis is very timely. Multiple similar studies have been conducted about the relationship between ESG and company performance, but there has only been a handful of similar studies conducted in Norway.

This thesis aims to analyse the relationship between ESG scores and the financial performance of listed companies in OMX Oslo from 2012 to 2021. To fill the aim the thesis seeks answer to the following research question:

1. How are ESG Scores related to the performance of companies in OMX Oslo?
2. How are the subcomponents E, S and G related to the performance of companies listed in OMX Oslo?

Twelve hypotheses will be stated to answer the research question and evaluate the results. The hypotheses are formed based on the previous research that has been conducted on similar topics and also based on theoretical frameworks. To formulate this thesis, data was collected on the listed companies in OMX Oslo from Bloomberg Terminal from 2012 to 2021 which led to an overall of 91 listed companies. This thesis utilizes panel data to determine the relationship of ESG to listed companies in OMX Oslo. Hausman test is conducted to determine between random effects model and fixed effects model and Variable Inflation Factor (VIF) test will be conducted to test the multicollinearity of the models. More recent ESG data is yet to be provided by the Norwegian companies, preventing conducting a more timely thesis.

This thesis paper is constructed into three separate chapters. The first chapter gives insight into the topic of sustainable finance and covers four theoretical frameworks used in this thesis. The frameworks are linked to ESG and company performance. The frameworks are legitimacy theory, shared value theory, agency theory and stakeholder theory. The second chapter will provide information on the study sample, study variables, descriptive statistics and the study methodology used in this thesis. The third chapter is about study results and discussion where there are results from the regression models followed by a discussion about the results.

1 SUSTAINABLE FINANCE

This chapter provides an overview of sustainable finance. Firstly providing an overview of sustainable finance and how Norway has implemented sustainable finance in their actions, followed by covering the conceptual framework used in this study by introducing the four theories - legitimacy theory, shared value theory, agency theory and stakeholder theory – used in this thesis. Previous research has covered the relationship between ESG and company performance. The last part of this chapter provides an overview of ESG disclosure and company performance and uses previous studies and theoretical frameworks to formulate four hypotheses for this thesis.

1.1 Sustainable finance in Norway

Sustainable finance has been a growing topic in recent years since more and more people are interested in overall sustainability. The interest is not only towards being environmentally friendly but also towards economic and societal aspects. Sustainable finance is a widely used term but still needs a clear definition because multiple terms can and cannot be connected to sustainable finance. The lack of clarity and boundaries creates ambiguity around the topic (Wilson, 2010). Therefore Capelle-Blancard and Monjon (2012) have declared sustainability as a trend in the financial market. European Commission (2023) has determined sustainable finance in the following way "Sustainable finance refers to the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects." To tackle the ambiguity around sustainable finance in 2006, The United Nations launched Principles for responsible finance, creating a clear framework for implementing ESG into financial decisions. (UNPRI, 2023) There are six practices in total, and they are stated as:

> Principle 1: We will incorporate ESG issues into investment analysis and decision-making processes.
> Principle 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.
> Principle 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.

Principle 4: We will promote acceptance and implementation of the Principles within the investment industry.
Principle 5: We will work together to enhance our effectiveness in implementing the Principles.
Principle 6: We will each report on our activities and progress towards implementing the Principles

According to Robeco (2022), Norway is tying for first place, with Finland being the world's most sustainable country. Norway has been heavily focusing on implementing and promoting ESG standards in the past years since their overall rank has increased by 2. They have had the highest overall ESG score increase in the top 15 countries during 2022. The effect of these actions can be seen in how companies in Norway take sustainability and ESG into account. 87 % of Norwegian companies have integrated sustainability into their core business strategy, and 63 % are focused on maximizing the impact of their actions and creating value (Sustainability Hub 2021). The effect of sustainability performance, however, has mixed results towards financial performance among Norwegian companies since 45 % of companies report only having a somewhat connection between the two, and the rest 55% are evenly distributed between low and high extent (Sustainability hub 2021).

1.2 Conceptual framework

This chapter discusses the theoretical basis for enhancing financial performance through sustainable practices and the advantages of having good Environmental, Social, and Governance (ESG) scores. This chapter examines four theories - legitimacy theory, shared value theory, agency theory and stakeholder theory - to understand how sustainability can be integrated into business practices to achieve positive outcomes for all stakeholders involved.

1.2.1 Legitimacy theory

Legitimacy theory, as conceptualised by Suchman (1995), argues that companies require societal verification or legitimacy to maintain their status and must operate responsibly. Environmental disclosure has increased within companies. According to O'donovan (2002), the legitimacy theory

is one of the main reasons companies disclose environmental information. Suchman (1995) described legitimacy theory as "a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". The legitimacy gained from society is flexible and evolving, and companies must adapt to changes in societal expectations in order to maintain their standing. Failing to uphold the social contract can negatively impact a company's prospects. To maintain or achieve the societal position, companies can show their determination by implementing new practices and policies that promote sustainability and ethical practices to gain legitimacy. ESG and the performance of companies see sustainable practices as legitimate actions, and research has shown that ESG activities can reduce total risk in European companies. Support this statement in a study conducted by Sassen et al. (2016), where the researchers discovered that the risk would be lower in companies with higher overall ESG scores. Therefore ESG reporting is a vital way of communication for companies to address information asymmetry issues in their business operations. Also, a study by Poppoli (2011) about linking CSR strategies to brand image found that companies promoting local CSR strategies strengthen the company image and create a competitive advantage. The study results are on par with the idea of legitimacy theory which also promotes the usage of CSR and ESG scores in a company's marketing processes to strengthen the company's image among consumers and investors. In recent years, companies have tried to change their operations by increasing corporate reporting and stakeholder engagement. According to Zyznarska-Dworczak (2022), these adjustments could be a significant measure towards clarifying the outcomes to stakeholders, mitigating the risk of losing their trust and enhancing the legitimacy of companies.

1.2.2 Shared value theory

According to Porter and Kramer (2011), the shared value theory suggests that ESG can positively impact a company's financial performance by investing in producing shared value for society. Companies might exploit the shared value theory to gain short-term gains. However, those who focus on long-term goals will benefit more by satisfying the needs of society with products and services while creating public welfare, advancing company operations, and promoting local economic development (Porter and Kramer, 2011). Supporting the shared value theory, Cegliński & Wiśniewska (2016) conducted a study about CSR as a competitive advantage source. The study found a connection between CSR applications and company performance, and in the future, CSR applications should be one of the main drivers in management processes. Shared value theory encourages companies to combat societal issues to increase productivity and create a competitive

edge. Porter and Kramer (2011) claim that the increased productivity and competitive edge comes from effective management and emphasising employee welfare.

Large corporations such as Nestlé, Alibaba and Norwegian have recognised the shared value theory globally. Nestlé (2023) states, “Creating Shared Value (CSV) is at the heart of our purpose: to unlock the power of food to enhance quality of life for everyone, today and for generations to come.”. Nestlé has implemented different initiatives to create shared value for its stakeholders. Examples of these implementations are: promoting responsible sourcing of food and sustainable agriculture, creating nutritious food options to fulfil the unique needs of different cultures, and also committing to reducing environmental harm by reducing emissions. Alibaba has created a “poverty-alleviation map” in their navigation system to promote small businesses located in rural areas to gain more attraction from tourists and other users (Alizila, 2018). Norwegian has been actively pushing new shared value implementations and creating shared value for its shareholders by promoting biofuel usage. It is committed to improving employee well-being and supporting local communities with partnerships and charities (Norwegian, 2023).

1.2.3 Agency theory

Agency theory developed by Coase (1937) argued that the way investor’s view companies and their operations is based mainly on assumptions. A company can be understood as a network of contracts where the allocation of resources is achieved through the exercise of authority and direction rather than solely through market transactions (Coase, 1937). The agency theory has been interpreted in many ways depending on the author's field of study and the study issue. The framework by Jensen and Meckling (1976) focuses on the importance of aligning the interests of shareholders and managers to minimise agency costs and improve the overall performance of a company. The framework by Jensen and Meckling (1976) has gained wide acceptance for comprehending the principal-agent relationship and has been utilised in various fields, such as finance, accounting, and management. Agency theory promotes transparency and active non-financial information disclosure from companies to the shareholders so they could be more aware of the company's operations. Like any other theory, agency theory also has its critics and flaws. The main flaw in agency theory is that shareholders must believe that the managers are transparent and do not withhold any information. Other flaws of the framework are A study by Feng et al. (2022) on the association between ESG score and stock price crash risk found that managers are willing to publish negative information and

utilise public-good signalling to obscure their disclosures. As a result, these actions can increase the risk of a significant drop in stock prices.

1.2.4 Stakeholder theory

Historically, companies have tended to prioritize the creation of value for their shareholders above all else, often to the detriment of other stakeholders such as employees, customers, and suppliers. However, according to Freeman (1984), companies should consider stakeholders (e.g. employees, customers, suppliers, shareholders) in all decision-making because companies should have a responsibility in addition to creating value for shareholders and creating value for all stakeholders affected by these decisions. Freeman suggests that the created value for internal and external stakeholders can create increased value for the company in the long run due to the company's positive image and loyal customers. Freeman's arguments can be summarized into four key points:

1. Companies have a social responsibility to consider the interests of all stakeholders who are affected by their decisions and actions, not just shareholders.
2. Stakeholders are interdependent, and their interests should be balanced and prioritized based on the specific context and circumstances.
3. Companies should strive to create value for all stakeholders, not just shareholders, and this can be achieved through practices such as corporate social responsibility, ethical management, and sustainable business practices.
4. The long-term success and sustainability of the company depend on its ability to build and maintain positive relationships with its stakeholders, which requires transparency, trust, and open communication.

To support the framework of stakeholder theory Taneja et al. (2011) conducted a study where they found that implementing CSR practices into corporate strategies can improve a company's financial performance. The study also found that CSR practices can bring several advantages to companies, such as enhancing their reputation, improving customer satisfaction, increasing their overall performance, and attract investors.

Like agency theory, stakeholder theory also has its critics. One of them is well-known economist Milton Friedman. Friedman (1962) stated, "The corporation is an instrument of the stockholders who own it". Friedman (1970) also stated, "there is one and only one social responsibility of

business—to use its resources and engage in activities designed to increase its profits". Clearly, Friedman's view was the polar opposite of Freeman's stakeholder theory by not considering the other stakeholders and only focusing on increasing the company's profits.

1.3 Previous research

Multiple previous studies have studied the association between ESG and company performance. Most of these studies have focused only on ESG scores as a whole or a single subcomponent. Galbreath (2013) has stated that since ESG scores are interrelated, only concentrating on a single subcomponent of ESG could create problems. Also, some previous studies conducted by Richardson (2009) and Hahn et al. (2010) on a similar topic have stated that focusing only on ESG subcomponents and company performance can lead to undermining the moral imperative to maintain social and environmental practices, which are crucial for the well-being of society and future investments. Therefore, in this study, it is essential to focus on all the aspects of ESG when measuring the association with company performance.

1.3.1 ESG disclosure and company performance

Environmental issues such as climate change and global warming are complex for companies since companies are significant contributors to those issues. However, companies can be affected negatively if these issues unravel out of control. As a result, firms are increasingly adopting environmentally friendly strategies and implementing disclosure policies that provide transparency around their environmental initiatives and progress towards achieving sustainability goals. (Nor et al. 2016). By implementing environmental practices, reducing production costs, and actively reporting to their stakeholders, companies create long-term benefits enhancing both company performance and environmental protection (Porter and Van der Linde, 1995). In addition, Majumdar and Marcus (2001) also concluded that increasing environmental regulations increase productivity. Both Dowell et al. (2000) and Saleh et al. (2011) found a positive association between commitment to environmental disclosure and company performance. Accordingly, the following hypotheses:

H1: There is a positive relationship between the environmental disclosure score and ROA
H2: There is a positive relationship between the environmental disclosure score and Tobin's Q
H3: There is a positive relationship between the environmental disclosure score and ROE

Turban and Greening (1997) defined CSR as a construct emphasising a company's responsibilities to shareholders, such as employees and society. Companies should focus on financial performance and consider their employees and communities when making decisions. Accordingly, such actions that increase social responsibility make companies more attractive to employees. Companies can build a stronger connection with stakeholders by focusing more on social initiatives, which leads to decreased costs and increased company performance (Fombrun et al., 2000). Taneja et al. (2011) found that implementing CSR practices can improve the company's performance. They also reported that implementing CSR practices, such as customer satisfaction and increased company reputation, could benefit firms. Margolis et al. (2007) found a positive relationship between high CSR and company performance. Barnett and Salomon (2012) also found similar results. Accordingly, the following hypotheses:

H4: There is a positive relationship between the social disclosure score and ROA
H5: There is a positive relationship between the social disclosure score and Tobin's Q
H6: There is a positive relationship between the social disclosure score and ROE

As companies keep improving, the role of governance has grown, and the importance of governance in companies has increased; companies who ignore the positive effects of applying effective governance fall behind their peers and become unstable (Nollet et al., 2016). Implementing better corporate governance in the long term is crucial for companies to perform at a higher level, and therefore companies should make sure they consider stockholders and other stakeholders to lower agency costs and promote the company's ability to perform better (Fama and Jensen, 1983). Companies that implement effective corporate governance policies are able to create a more transparent environment for the stakeholders, which will lead to a stronger connection with the stakeholders and also improve the performance of the company (Merza Radhi and Sarea, 2019). Past research has indicated that applying corporate governance policies has been mixed. However, Weisbach (1988) has reported a positive correlation between higher corporate governance and CEO turnover to increase company performance. Klapper and Love (2014) also concluded that there is a positive correlation between the quality of governance and the performance of a company. Hussein

and Kamardin (2016) also studied how implementations of corporate governance affect company performance, and the results showed a positive relationship. Accordingly, the following hypotheses:

H7: There is a positive relationship between the corporate governance disclosure score and ROA
H8: There is a positive relationship between the corporate governance disclosure score and Tobin's Q
H9: There is a positive relationship between the corporate governance disclosure score and ROE

The increased popularity of ESG with stakeholders has driven companies to be more active in keeping track of their ESG activities and reporting them to the stakeholders. As stated before, most previous studies about ESG and company performance have only focused on a single dimension of ESG rather than ESG as a whole. Financial reports from companies do not fully disclose ESG data, and companies are also incompetent to provide necessary information about a company's quality, equity, reputation and safety (Bassen and Kovács, 2008). Using ESG disclosure for reporting is crucial to companies since it creates value for stakeholders. The information helps managers apply compliance and ESG guidelines for the organization. Previously conducted studies on the topic of ESG and company has stated that there is a positive correlation between ESG and company performance. Pasquini-Descomps and Sahut (2013) studied the connection between ESG scores and company performance, and the results indicated that ESG scores positively correlate to company performance. They used ROA (return on assets) as a metric, and the study also stated that achieving a higher ESG score positively affects company image. Accordingly, the following hypotheses:

H10: There is a positive relationship between the overall ESG disclosure score and ROA
H11: There is a positive relationship between the overall ESG disclosure score and Tobin's Q
H12: There is a positive relationship between the overall ESG disclosure score and ROE

2 DATA AND METHODOLOGY

This thesis chapter presents the analytical approach used in this study, starting with the description of the sampling process, followed by an overview which covers the dependent, independent, and control variables employed in the research. An overview of descriptive statistics and correlation matrix is provided, covering the essential values from the variables used in this thesis. Finally, this chapter outlines the study methodology used.

2.1 Study sample, variables and descriptive statistics

The study sample is formed from all listed companies in OMX Oslo between 2012 and 2021. Years 2012-2021 were chosen due to the limitations of reported ESG data among companies listed in OMX Oslo. According to Bloomberg (2023), from the 283 companies total of 91 companies listed in OMX Oslo have published their ESG scores in the chosen period, and the selected time period resulted in 453 observations from 91 companies. All of the data is collected from Bloomberg Terminal. Bloomberg's ESG disclosure scores are considered major indices to identify ESG's sub-components E, S and G disclosures. Bloomberg ESG score is scaled from 0 to 100, with zero being a company with no disclosure and a hundred being a company with full disclosure.

Given that an ESG score is a multidimensional index built on the outputs of environmental, social and governance disclosures, and the impact of one dimension may sometimes eliminate opposing effects of another dimension, it is useful to have separate data available (Brammer et al., 2009; Buallay et al., 2020). Therefore, this thesis will consider the overall ESG score and additionally the subcomponents of ESG: E, S and G as independent variables to measure which dimension has most impact on company performance. In this study, the performance of firms was assessed based on three dimensions: operational, financial, and market performance, which were measured using the metrics of return on assets (ROA), return on equity (ROE), and Tobin's Q, respectively. This study considers these variables as dependent variables. To measure the effect of ESG to company performance company size, leverage and asset turnover rate are essential control variables (Margolis et al., 2009; Pasguini-Decomps and Sahut, 2014). In the previous studies total assets is used as a size variable and the size variable is calculated in Formula 1 below:

$$SIZE = ln(Total\ assets) \quad (1)$$

Descriptive statistics are presented in Table 1. It represents summary statistics from the sample selection. As mentioned, ESG scores are scaled from 0 to 100, with zero being a company with no disclosure and a hundred being a company with full disclosure. Commonly, an ESG score of 70 and above is considered excellent, and scores below 50 are considered poor. The average ESG score within listed companies in OMX Oslo is 35.83, and the median is in a similar range, being 34.58. Therefore, more than half of the ESG scores are considered poor. Some companies report higher ESG scores since the maximum score from listed companies in ESG is 73.82, which is considered excellent. However, the value is over two standard deviations and could be considered an unusual data point. The subcomponents of ESG show that companies in OMX Oslo focus more on the governance aspect than the environmental and social aspects. The mean and median of the governance score are over 40 points higher than in other sub-components. Most of the variables have high standard deviations indicating a high spread of data and variability among listed companies in OMX Oslo. The mean Tobin's Q value is higher than 1, and on average, the assets and future earnings of listed companies in OMX Oslo are valued higher in the market than the replacement cost of those assets. Both ROE and ROA have a high range between minimum and maximum values indicating that within companies in OMX Oslo, there is high variability in how efficiently companies can use their assets and equities to generate profit. Minimum, first quartile, median, third quartile, maximum and mean are represented in the table 1:

Table 1. Descriptive statistics

	roe	roa	Tobin's q	esg	e	s	g	leverage	turnover	size
min	-46.76	-27.45	0.42	10.00	0.33	2.57	17.13	1.13	0.0002	2.92
q1	0.93	0.29	0.96	27.18	14.38	17.14	49.83	2.02	0.21	7.68
median	8.63	2.65	1.26	34.58	21.62	22.43	58.40	2.68	0.52	8.90
q3	17.50	6.76	1.76	43.52	33.37	29.84	67.29	4.18	0.94	10.70
max	49.85	25.43	4.11	73.82	73.27	61.79	93.62	15.40	3.74	14.89
mean	8.46	3.01	1.45	35.83	24.45	24.64	58.31	3.78	0.65	9.13
s. dev	16.03	6.15	0.68	12.36	17.08	11.34	14.35	2.83	0.57	2.19

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

To measure correlation between variables a correlation matrix was conducted. Table 2 shows the correlation between all of the independent, dependent and control variables. ESG and its subcomponents E, S and G have positive correlation between each other which could indicate that dependent variables could predict other dependent variables in regression model. Dependent variables return on assets (ROA) and return on equity (ROE) also have high correlation.

Table 2. Correlation matrix

	roe	roa	Tobin's q	esg	e	s	g	leverage	turnover	size
roe	1.00									
roa	0.89	1.00								
tobins q	0.31	0.27	1.00							
esg	0.10	0.10	0.04	1.00						
e	0.09	0.11	-0.02	0.90	1.00					
s	0.01	0.03	-0.07	0.89	0.77	1.00				
g	0.13	0.10	0.18	0.82	0.54	0.60	1.00			
leverage	0.00	-0.12	-0.14	-0.11	-0.05	-0.13	-0.13	1.00		
turnover	0.39	0.29	0.29	0.01	-0.01	-0.08	0.11	0.10	1.00	
size	0.03	0.06	0.07	-0.05	-0.04	-0.06	-0.03	0.01	-0.04	1.00

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

2.2 Study Methodology

This study utilizes panel data from listed companies in OMX Oslo during 2012-2021 to examine the relationship between ESG and company performance. Different regression models are used in this thesis to answer the hypothesis and the research question formulated in the previous chapters. The First regression model consists of all the previously stated scores to understand better the relationship between ESG and company performance of listed companies in OMX Oslo. Further models will include separate variables to gain in-depth information on the relationship between ESG and company performance.

When conducting a regression study utilizing panel data to measure the relationship between ESG and company performance, the two most utilized models are the fixed and random effects models.

Snijders (2005) stated that the random effects model assumes that the remaining variation in a dataset is not correlated with the independent variables, and in contrast, the fixed effect model evaluates the portion of the remaining variation that the independent variables can explain. The regression models:

Fixed effects model: $yit = \alpha i + \beta 1Xit + \beta 2Xit + \ldots + \beta nXit + \varepsilon it$ (2)

where

y = dependent variable,

αi = intercept for each individual,

β = estimated coefficient,

x = independent variable,

ε = error term

Random effects model: $yit = \alpha + \beta 1Xit + \beta 2Xit + \ldots + \beta nXit + \varepsilon it + uit$ (3)

where

y = dependent variable,

α = common intercept,

β = estimated coefficient,

x = independent variable,

ε = error term

Mainzer (2018) stated that the Hausman test is conducted to determine between random and fixed effects models when using panel data. The Hausman test determines the correlation between independent variables and error terms to be significant or non-significant. Commonly for the Hausman test, a null hypothesis is stated that the covariate is exogenous. If the null hypothesis is rejected, the fixed effects model is used for the analysis, and vice versa if accepted, the random effects model is used for the study. If the p-value of the Hausman test is under 0.05, the null hypothesis can be rejected, and the fixed effects model is utilized. On the other hand, if the p-value is higher than 0.05 null hypothesis can be accepted, and the random effects model is utilized. Therefore to determine which of the two presented models to use in this thesis, separate Hausman tests are conducted.

Variable Inflation Factor (VIF) test will be conducted to test the multicollinearity of the models. To better understand the models' multicollinearity, the VIF test is conducted using all of the subcomponents of ESG and control variables in the same test. Also, the VIF test is conducted

separately to the subcomponents of ESG as well as the ESG score as a whole to identify multicollinearity in each model. According to O'Brien (2007), the VIF test is a commonly used method for assessing the extent of multicollinearity among independent variables in a regression model. The VIF test measures the degree to which each independent variable is linearly related to other independent variables in the model. Usually multicollinearity occurs if over two variables correlates highly between each other and it leads to increased errors and reduced statistical efficiency of the regression model. If the value of VIF test is 1 the independent variables do not correlate with other independent variables and multicollinearity does not exist in the model. VIF test results between 1 to 5 indicates that there is moderate correlation between the independent variables and there is some multicollinearity. Results over 5 indicates that the independent variables correlate highly between each other and there is high level of multicollinearity in the model. High multicollinearity indicates that the coefficients are unreliable and the model should be corrected.

3 ANALYSIS AND DISCUSSION

This chapter presents the findings and discussion on the relationship between ESG scores and the financial performance of listed companies in OMX Oslo from 2012 to 2021. A combined model, including all components of ESG, is presented and analyzed first, followed by an analysis of individual components of ESG and dependent variables ROA, ROE and Tobin's Q. VIF test results are presented, showcasing the multicollinearity of the combined model and the individual models. The analysis is followed by a chapter in which results are compared to previous studies and literature.

3.1 Regression results

Table 3 presents the combined model. For each dependent variable, the number of observations used was 453 from 91 companies. For the combined model, dependent variables are presented in the second row in their respective columns. Independent variables and control variables are located on the left side of the table, presenting their coefficient values for each dependent value, and the p-value for each coefficient is presented in brackets. Followed by the independent and control variables, within, between and overall R-squared values are displayed. For the ROA model, the overall R squared was 0.214, indicating that the regression model explains 21.4% of the variability observed in the target variable. For Tobin's Q and ROE model, the overall R squared value was 0.17 and 0.27, respectively, indicating how much of the variability is explained by the regression model. The R-squared values are followed by the Hausman test results and the model used for each dependent variable.

None of the independent variables indicated a significant relationship to dependent variables ROA, Tobin's Q or ROE in the combined model. For the control variables, the p-value for turnover for each dependent variable was less than 0.01, and the coefficient was positive, indicating a highly significant positive relationship with the dependent variables. In addition, leverage had a p-value less than 0.01 and a negative coefficient in Tobin's model, indicating a significant negative relationship with Tobin's Q. Since there is significant positive relationship between turnover and each dependent variable we can excpect an percentage point increase of 4.5, 0.357 and 12.352 to ROA, Tobin's Q and ROE respectivily with every one unit increase in turnover. Since leverage has significant relationship in Tobin's Q model we can excpect with every one point increase in

leverage Tobin's Q will decrease by 0.063 percentage points.As mentioned in the study methodology chapter, The Hausman test was conducted for each dependent variable in the combined model to understand whether to use random effects model or fixed effects model. If the p-value of the Hausman test is under 0.05, the null hypothesis can be rejected, and the fixed effects model is utilized. On the other hand, if the p-value is higher than 0.05 null hypothesis can be accepted, and the random effects model is utilized. The Hausman test results for all of the dependent variables ROA, Tobin's Q and ROE exceed the p-value of 0.05, and therefore random effects model is used for all of the dependent variables.

Table. 3 Combined model

Combined model		Observations	453
	ROA	TQ	ROE
E	0.046 (0.294)	0.003 (0.505)	0.059 (0.541)
S	0.03 (0.637)	-0.002 (0.797)	0.086 (0.603)
G	-0.021 (0.556)	0.004 (0.280)	0.039 (0.735)
Leverage	-0.283 (0.146)	-0.063 (0.002)	-0.113 (0.887)
Turnover	4.25 (0.000)	0.357 (0.000)	12.352 (0.000)
Size	0.156 (0.130)	-0.002 (0.838)	0.418 (0.185)
R2:			
Within	0.161	0.071	0.142
Between	0.131	0.126	0.177
Overall	0.168	0.135	0.202
Hausmann	0.214	0.170	0.270
Model	Random	Random	Random

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

Variable Inflation Factor (VIF) test results are presented in Table 4. Different models are represented by their respective columns, and independent and control variables present their VIF test results in their respective rows for each model. Individual models E, S, G and ESG demonstrate a low level of multicollinearity as the models' mean score varies between 1.01 and 1.02. The combined model indicates a higher level of multicollinearity as the mean result is 1.7, and the subcomponents of ESG vary between 1.67 and 2.89. The lower VIF test results from the

subcomponents and overall ESG model compared to the combined model indicate that the regression should be studied by conducting individual regression models in addition to the combined model. Total p-value of each model is presented in Appendix 2 where the calculated model is presented on the left side and the p-value of model is on the right. Each model is statistically significant since the p-values are less than 0.05.

Table. 4 VIF results

	COMBINED MODEL	E	S	G	ESG
E	2.54	1			
S	2.89		1.03		
G	1.67			1.03	
ESG					1.02
LEVERAGE	1.04	1.01	1.03	1.03	1.02
TURNOVER	1.06	1.01	1.02	1.03	1.01
SIZE	1.01	1	1.01	1	1
MEAN	1.7	1.01	1.02	1.02	1.01

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

The independent models for ROA, Tobin's Q and ROE are displayed in three tables where each model is represented in their respective columns. The independent model for ROA is presented in Table 5. In the independent ROA model, independent variables E, S and ESG have a relationship with 10% significance level with the dependent variable ROE since the p-value for each independent variable is less than 0.1. Since ROA and independent variables E, S and ESG have a positive relationship, with every one unit increase in E, S and ESG, we can expect a percentage point increase of 0.051, 0.065, and 0.064 to ROA, respectively. For the control variables, turnover had positive coefficients and a p-value less than 0.01 indicating a strong positive relationship with ROA. Since there is a significant positive relationship between turnover and each independent ROA model, with every unit increase in turnover, we can expect a percentage point increase of 4.191, 4.2, 4.121 and 4.149 to ROA in models E, S, G and ESG, respectively. The Hausman test for all models

was over 0.05; therefore, the null hypothesis was rejected, and each model used the random effects model.

Table. 5 Independent ROA model

ROA MODEL			OBSERVATIONS	453
	E	S	G	ESG
E	0.051 (0.053)			
S		0.065 (0.066)		
G			0.008 (0.807)	
ESG				0.064 (0.074)
LEVERAGE	-0.301 (0.111)	-0.264 (0.168)	-0.307 (0.108)	-0.288 (0.121)
TURNOVER	4.191 (0.000)	4.200 (0.000)	4.121 (0.000)	4.149 (0.000)
SIZE	0.156 (0.133)	0.158 (0.118)	0.149 (0.144)	0.158 (0.119)
R2 :				
WITHIN	0.158	0.156	0.153	0.154
BETWEEN	0.137	0.133	0.116	0.141
OVERALL	0.172	0.158	0.155	0.166
HAUSMANN	0.509	0.488	0.117	0.262
MODEL	Random	Random	Random	Random

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

The independent model for Tobin's Q is presented in Table 6. Independent variables E, S, G and ESG did not have a significant relationship with the dependent variable Tobin's Q. Both leverage and turnover indicated a significant relationship in each model with the dependent variable Tobin's Q. The leverage coefficient score was negative in each model. The p-value was less than 0.01, indicating a strong negative relationship with the dependent variable Tobin's Q. The turnover coefficient was positive in each model. The p-value was less than 0.01 showcasing a strong positive relationship with the dependent variable Tobin's Q. Since there is a significant positive relationship between turnover and each independent Tobin's Q model, with every one unit increase in turnover, we can expect a percentage point increase of 0.36, 0.359, 0.355 and 0.361 to Tobin's Q in models E, S, G and ESG respectively. Also since there is a significant negative relationship with leverage and Tobin's Q with every one unit increase we can expect a percentage point decrease of 0.058,

0.057, 0.062 and 0.059 to Tobin's Q in models E, S, G and ESG respectively. The Hausman test results in each Tobin's Q model were over 0.05, leading to rejecting the null hypothesis and using the random effects model.

Table. 6 Independent Tobin's Q model

TOBIN'S Q MODEL			OBSERVATIONS	453
	E	S	G	ESG
E	0.003 (0.324)			
S		0.002 (0.621)		
G			0.005 (0.23)	
ESG				0.006 (0.219)
LEVERAGE	-0.058 (0.002)	-0.057 (0.003)	-0.062 (0.001)	-0.059 (0.002)
TURNOVER	0.36 (0.000)	0.359 (0.000)	0.355 (0.000)	0.361 (0.000)
SIZE	-0.002 (0.782)	-0.002 (0.786)	-0.002 (0.834)	-0.002 (0.835)
R2 :				
WITHIN	0.071	0.066	0.065	0.072
BETWEEN	0.105	0.135	0.111	0.111
OVERALL	0.115	0.142	0.119	0.116
HAUSMANN	0.094	0.114	0.383	0.199
MODEL	Random	Random	Random	Random

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

Table. 7 presents the independent model for the dependent variable ROE. The Hausman tests were conducted for each model, and the p-values exceeded 0.05. Therefore, the random effects model was used for each model in the independent ROE model. In the independent ROE model, independent variables E, S, and ESG have a relationship with 10% significance level with the dependent variable ROE since the p-value for each independent variable is less than 0.1. Since ROE and each independent variable have a positive relationship, with every one unit increase in E, S, and ESG, we can expect a percentage point increase of 0.105, 0.167, and 0.179 to ROE, respectively. The control variable turnover is the only control variable showing a significant relationship with the

dependent ROE. Turnover has a positive coefficient in each model and a p-value less than 0.01, indicating a strong positive relationship with the dependent variable ROE. Since there is a significant positive relationship between turnover and each independent ROE model, with every one unit increase in turnover, we can expect a percentage point increase of 12.366, 12.423, 12.115 and 12.292 to ROE in models E, S, G and ESG respectively.

Table. 7 Independent ROE model

ROE MODEL			OBSERVATIONS	453
	E	S	G	ESG
E	0.105 (0.088)			
S		0.167 (0.080)		
G			0.093 (0.333)	
ESG				0.179 (0.056)
LEVERAGE	-0.177 (0.826)	-0.075 (0.926)	-0.175 (0.823)	-0.129 (0.870)
TURNOVER	12.366 (0.000)	12.423 (0.000)	12.115 (0.000)	12.292 (0.000)
SIZE	0.405 (0.205)	0.416 (0.191)	0.403 (0.196)	0.418 (0.184)
R2 :				
WITHIN	0.141	0.144	0.136	0.14
BETWEEN	0.166	0.164	0.179	0.182
OVERALL	0.205	0.193	0.202	0.204
HAUSMANN	0.873	0.91	0.215	0.686
MODEL	Random	Random	Random	Random

Source: Authors own calculations based on data from Bloomberg Terminal (2023)

The results from the combined model and independent model for Tobin's Q showcased similar relationships between dependent variables and independent variables by not finding any significant relationship between independent variables and Tobin's Q. Independent ROA and ROE models found positive relationship between the models dependent variable and independent variables E, S, and ESG. Independent variable G did not have significant relationship with dependent variables in any of the models. For the control variables, turnover showed a significant positive relationship with all of the dependent variables in all of the independent regression models and in the combined

model. Leverage had a negative coefficient and p-value less than 0.01 in Tobin's Q model in both the combined regression model and the independent regression model.

3.2 Findings and discussion

Independent variable E (environmental disclosure score) had a significant positive relationship with the dependent variables ROA and ROE but not with Tobin's Q. The ROA and ROE results of this thesis for environmental disclosure score are in line with the studies conducted by Dowell et al. (2000) and Saleh et al. (2011). Both studies found a positive association between commitment to environmental disclosure score and company performance. The relationship between environmental scores and company performance receives mixed results. For example, a study by Pucheta-Martínez et al. (2020) concluded that environmental reporting negatively affects company performance. Similar to Tobin's Q results of the regression models in this thesis, Malarvizhi and Matta (2016) conducted a study about environmental disclosure and company performance, concluding that there is no significant relationship between environmental disclosure and firm performance. Environmental disclosure score had a positive relationship with low coefficient value with ROA and ROE in the independent models. Therefore H1 and H3 failed to be rejected. The environmental disclosure score did not show a significant relationship with Tobin's Q. Therefore, H2 is rejected.

Similarly to the environmental score results, regression results in this thesis indicate a positive relationship between the social disclosure score and the dependent variables ROA and ROE. Social disclosure score did not have a significant relationship with Tobin's Q. The ROA and ROE results are aligned with the previous studies used to formulate the hypothesis that the social disclosure score would have a positive relationship with dependent variables/company performance. However, some studies support similar results to the relationship between Tobin's Q and the social disclosure score. For example, Alikhani and Maranjory (2013), who studied the relationship between social and environmental disclosure and company performance, concluded their study by finding no significant relationship between them. The second hypothesis was rejected since there was no evidence of a positive relationship between the environmental disclosure score and the dependent variables. The results indicate that in the independent models, there is a positive relationship between social disclosure score and ROA and ROE, although the coefficient values are low. As a

result, H4 and H6 are not rejected. However, no significant relationship is observed between the social disclosure score and Tobin's Q, leading to the rejection of H5.

In the descriptive statistics governance disclosure among listed companies in OMX Oslo was notably higher compared to the other sub components of ESG. Comparativly high disclosure score companred to other subcomponents however did not lead to better significance in the regression models. The governance disclosure score had significantly highest p-values in all of the independent models and combined model in comparison to the other subcomponents indicating that the governance disclosure score has the weakest evidence among the subcomponents of ESG to the relationship between one of the subcomnponents to the company performance. The regression results conducted in this thesis are not in line with the previous studies that indicated that governance scores would have positive relationship with the dependent variables. However, similarly to this thesis Modugu (2017) found no significance relationship with profitability and governance disclosure when studying the company performance and corporate disclosure of listed companies in Nigeria. Since the governance score failed to show significant relationship with any of the dependent variable H7, H8 and H9 are rejected.

The overall disclosure ESG score was only used in singe component regression models due to the multicollinearity issues detected in the combined model and in the VIF test. The overall ESG scores relationship to ESG has also had mixed results from researchers, with some studies indicating a positive relationship between ESG performance and overall company performance. In contrast, other studies have found no significant or negative relationship between these variables. A recent study by Giannopoulos et al. (2022) about the ESG disclosure and financial performance of Norwegian listed firms. Similarly to this thesis, the study by Giannopoulos et al. (2022) found a significant positive relationship between ESG and the dependent variable ROA but contrary to this study they also found significant positive relationship with Tobin's Q. Some researchers argue that the mixed results could be due to differences in the measurement and interpretation of ESG metrics across industries and companies, making it difficult to draw consistent conclusions. Others suggest that the mixed results could be due to variations in the sample size, period, and other contextual factors that could influence the relationship between ESG and overall company performance. Even though the study topic by Giannopoulos et al. (2022) is similar to this thesis, the differences in the sample are noticeable, creating differences in results. As mentioned in the previous chapters, globally, multiple companies provide ESG data with their own scoring methods, creating a difference between databases. This study utilized Bloomberg Terminal as a data source to gather the

ESG data, and Giannopoulos et al. (2022) used Thomson Reuters Eikon as their database. Another noticeable difference between the two studies is the sample. This thesis utilized 91 different companies in the data set, and the study by Giannopoulos et al. (2022) used only 67 companies, therefore, using more minor sample data. The study by Giannopoulos et al. (2022), about the ESG disclosure and financial performance of Norwegian listed firms from 2011 to 2019 compared to this thesis that uses data from the years 2012 to 2021, creating a more recent picture of the relationship between ESG and company performance in listed companies in Norway. Overall ESG score had a positive relationship with ROA and ROE in the independent models. Therefore H10 and H12 failed to be rejected. The overall ESG disclosure score did not show a significant relationship with Tobin's Q. Therefore, H11 is rejected.

In the next page hypothesis and the results for each hypothesis are summarized in the Table 8 showcasing all of the twelwe hypotheses formulated previously and results based on the different regression models conducted in this thesis. All of the hypotheses related to Tobin's Q were rejected. Similary all of the hypotheses related to the corporate governance score were rejected.

Table. 8 Hypothesis results

Hypothesis	Definition	Result
H1	There is a positive relationship between the environmental disclosure score and ROA	Failed to reject
H2	There is a positive relationship between the environmental disclosure score and Tobin's Q	Rejected
H3	There is a positive relationship between the environmental disclosure score and ROE	Failed to reject
H4	There is a positive relationship between the social disclosure score and ROA	Failed to reject
H5	There is a positive relationship between the social disclosure score and Tobin's Q	Rejected
H6	There is a positive relationship between the social disclosure score and ROE	Failed to reject
H7	There is a positive relationship between the corporate governance disclosure score and ROA	Rejected
H8	There is a positive relationship between the corporate governance disclosure score and Tobin's Q	Rejected
H9	There is a positive relationship between the corporate governance disclosure score and ROE	Rejected
H10	There is a positive relationship between the overall ESG disclosure score and ROA	Failed to reject
H11	There is a positive relationship between the overall ESG disclosure score and Tobin's Q	Rejected
H12	There is a positive relationship between the overall ESG disclosure score and ROE	Failed to reject

Source: Authors own summary (2023)

CONCLUSIONS

This thesis focused on the relationship between ESG and the companies in Norway during 2012 to 2021. The reason for conducting this thesis was to provide more information on how ESG and company performance are related in the most sustainable country in the world. The study sample consisted of 91 companies from the 276 listed on the OMX Oslo stock exchange. The reason behind the low number of companies used in this thesis compared to all of the listed companies in OMX Oslo is due to the lack of ESG reporting among companies in OMX Oslo. The lack of ESG reporting also affected the time period used in this thesis because during the data gathering, ESG reporting information was not available for the year 2022 in the Bloomberg Terminal database. This thesis focused on answering to the research questions of "How are ESG Scores related to the performance of companies in OMX Oslo?" and "How are the subcomponents E, S and G related to the performance of companies listed in OMX Oslo?". To answer the research questions twelwe hypotheses were conducted to distinguish the relationship between ESG and company performance of listed companies in OMX Oslo. Panel data was used to analyse the relationship between ESG and the company performance of companies listed in OMX Oslo. The Hausman test was conducted to decide between the two regression models, the random effects model and the fixed effects model. The Hausman test result determined that the random effects model was utilised in all the independent and combined models. Variable Inflation Factor (VIF) test was conducted to address the multicollinearity issues in the models, and the results from VIF tests indicated that the independent models had lower multicollinearity scores which led to conducting independent models for all of the dependent variables.

Some of the study's limitations were covered in the previous paragraph covering the lack of ESG reporting among listed companies in the OMX Oslo stock exchange. This thesis only used Bloomberg Terminal as a database to gather company information. As mentioned in the introduction, other notable databases provide ESG data, such as MSCI and Thompson Reuters. ESG score is a widely used metric among companies to showcase their sustainability levels to the public and investors. However, ESG score relies heavily on companies reporting their ESG scores, which could be altered or classified as non-reliable. The results could vary between different databases due to the way ESG disclosure score is measured among these databases. The sample of 91 companies in this thesis is only a fraction of all listed companies in OMX Oslo, making it difficult to formulate an overview of the relationship between ESG disclosure score and company performance.

The study results suggest that among companies listed in OMX Oslo, there was no significant relationship between ESG disclosure scores and Tobin's Q, indicating that in terms of market value investors of companies in OMX Oslo do not value high ESG scores. However this thesis found positive relationship with ESG and both ROE and ROA which could indicate that companies in OMX Oslo which have higher ESG rating have better financial performance and are more likely to generate higher returns for their shareholders. Previous studies have shown mixed results for the relationship between ESG and company performance since some previous studies have found similar results when studying the relationship between ESG and company performance than this thesis, while some study findings have found a significant relationship between ESG and company performance. Even though this study did not find a strong positive relationship between ESG and company performance implementations of ESG metrics in companies listed in OMX Oslo should not be totally abolished since companies may still choose to apply ESG metrics despite not achieving a boost in performance. By implementing ESG metrics, companies could fulfil their responsibilities to stakeholders and society.

For the subcomponents of ESG, the G (governance score) did not show significant relationship to any of the dependent variables indicating that implementations does not have relationship to company performance in companies listed in OMX Oslo. Subcomponents E (environmental) and S (social) however did have relationships with ROA and ROE indicating that among the subcomponents E and S are more important when considering company performance of listed companies of OMX Oslo.

The relationship of ESG has been a popular topic in the past years, but many of those studies are focused outside of Norway despite Norway has been ranked highly in sustainability. This thesis found some similar results as previous studies conducted in Norway however some results were not in line with past results. One of the main differences between the past studies and this thesis was the database used. Therefore for future research, gathering data from different ESG database providers and combining or comparing the data received to gain a better overview of companies listed in OMX Oslo. Also, implementing different performance metrics could provide a wider understanding of ESG and company performance in the market. Future research could also be extended to other highly ranked countries in the sustainability rankings to distinguish if the studies of other countries come to similar conclusions

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Appendix 1. Dataset

https://docs.google.com/spreadsheets/d/1iOUc57q2hZylUYV_rpmfUafWaGCuQbfEFZaIhS4Q9d8/edit?usp=sharing

Appendix 2. Total p-value of model

Model	Total p-value
Combined:	
ROA	0.0000
Tobin's Q	0.0000
ROE	0.0000
E:	
ROA	0.0000
Tobin's Q	0.0000
ROE	0.0000
S:	
ROA	0.0000
Tobin's Q	0.0000
ROE	0.0000
G:	
ROA	0.0000
Tobin's Q	0.0000
ROE	0.0000
ESG:	
ROA	0.0000
Tobin's Q	0.0000
ROE	0.0000

Source: Author's own calculations (2023)

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