KWEKU ENYINFUL HEWTON AND ERIC ABOAGYE
SUPERVISOR: JEAN PAUL RABANAL SOBRINO

ESG and Firm Performance: Evidence from Selected Countries in Europe

University of Stavanger

Abstract

The 2008 financial crisis highlighted the need for ESG disclosure in corporate reporting. Yet there has been inconclusive evidence about its relationship with firm performance. This research investigated the relationships among Environmental, Social, and Governance (ESG) factors and firm performance in Europe. This study seeks to understand how firm performance affects ESG ratings and how ESG ratings impact firm performance. Panel data analysis was employed to analyse data of listed companies from the selected countries in Europe (Germany, United Kingdom, Italy, France, and Norway). The research findings indicate that there is no significant relationship between earnings per share (EPS) and ESG. Furthermore, there was a significant positive relationship between ESG and Market Value (Mcap). However, a significant negative relationship is observed between return on assets (ROA) and ESG, suggesting that firms investing in ESG may face challenges in generating sufficient returns on their assets due to the cost burden associated with ESG investments. For effective ESG implementation, policymakers and managers should prioritize cost reduction and profitability strategies.

Foreword

This thesis is written by two students as part of the requirement to obtain a Master's Degree in Applied Finance at the University of Stavanger.

Thank You!

Table of Contents

List of Tables

1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

The effect of the 2008 financial crisis and global recession has resulted in increasing pressure on corporate reporting for high-quality growth and sustainable development. Alongside this, stakeholders have developed a growing interest in Environmental, Social, and Governance (ESG) issues (Ruan & Liu, 2021) and companies are increasingly realizing that ESG considerations are not only essential for ethical and social reasons but also have potential implications for their financial performance. As a result, ESG disclosure has emerged as a crucial subject of concern for both companies and investors, reflecting the need for transparency and accountability in addressing these matters. From January to July 2020, ESG-themed exchange-traded fund (ETF) products experienced substantial growth in global inflows, 2.13 times compared to the corresponding period in 2019 (Ruan & Liu, 2021).

ESG refers to the non-financial performance or activities, particularly environmental social, and corporate governance of an organization and its relation with the stakeholders. The purpose of ESG disclosure is to provide stakeholders and users of information with non-financial information that can help them make informed decisions about a company's non-financial performance, the impact on their stakeholders, and long-term sustainability and value.

Although the benefits and costs associated with ESG and its disclosures are not apparent or directly found in the financial statement, they cannot be underestimated. According to a survey conducted by the United Nations Global Compact in 2013, a significant majority of chief executive officers (CEOs) worldwide recognized the importance of environmental, social, and governance (ESG) related issues for their business success. Out of the 1000 CEOs surveyed, nearly 93% expressed that these issues were crucial to their companies (UN, 2019).

Despite the advantages that ESG disclosure has (Eccles and Serafeim, 2013; Kotsantonis and Serafeim, 2019; Jo and Harjoto,2012) not all businesses are completely open about it. However, the adoption of more uniform ESG reporting frameworks, such as the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB), has therefore been pushed in recent years by businesses.

In 2006, the European Union (EU) introduced mandatory disclosure of ESG factors through a "comply or explain" approach. This approach requires companies to either comply with the ESG reporting requirements or provide an explanation for non-compliance. In addition, European Union is also considering the implementation of a harmonized taxonomy and measures to tighten its "non-financial reporting directive". These laws are expected to have financial performance and implications for companies.

With the oil industry being one of the leading emitters of carbon, it is expected that a country like Norway which is a leading exporter of Oil needs to take sustainability and the impact of these firms into serious consideration. It is no surprise that there is a growing recognition of ESG and sustainability among firms in Norway. Norway's commitment to sustainability is evident from most of its policies such as the decision to double annual climate financing by 2026. The governments have also implemented stringent measure with the Norwegian Sovereign Wealth Fund to exclude companies involved in activities like tobacco and other that tends to destroy the environment. Overall, the concept of ESG is gradually becoming a means by which companies communicate their social activities to their stakeholders. By providing investors with transparent and reliable information about their ESG performance, companies can position themselves for long-term success and contribute to a more sustainable future.

1.2 RESEARCH PROBLEM AND GAPS

Environmental, Social, and Governance (ESG) disclosure has become an important issue in the business world due to increasing concerns over corporate responsibility and sustainability. Despite the cost direct and indirect costs or benefits associated with it, there have been varying views about the linkages between ESG and firm performance. Some studies have found a positive relationship (e.g., Eccless & Serafeim, 2013; Kotsantonis & Serafeim, 2019), a negative relationship (e.g., Giannopoulos et al., 2022) and a mixed relationship (e.g., Buallay,2018; Yawika & Handayani 2019). Others found no relationship (e.g., Atan et al., 2018). Also, most literature that studied ESG and firm performance studied the impact ESG has on firm performance (Tahmid et al., 2022; Bullay, 2018; Giannopoulos et al.2022), ignoring the role firm performance plays in deciding a firm's involvement in ESG. Even though the slack theory posits that a firm will pursue ESG activities beyond making a profit when resources are abundant (Chen et al., 2021). Studies that have attempted to examine these two studies together focused on Asia (Behl et. al.,2021; Maji & Lohia, 2022) with little focus on Europe, exceptions

include Ivascu et. al.,2022 and Lanjnef & Allouz. Examining the effect of ESG on firm performance and the reverse effect of firm performance on ESG will help deepen the understanding of the bidirectional relationship between ESG and firm performance.

Also, companies with high CO_2 footprints such as power generation, chemical, metal, and mining sectors often face additional costs resulting from environmental regulations. These companies are highly sensitive to ESG and are expected to have higher ESG disclosure requirements compared to industries with lower environmental impact, like the service industry (Blacconiere & Northcutt 1997; Blacconiere & Patten, 1994). Therefore, it is important to consider sector-specific factors when examining the relationship between ESG practices and financial performance. Hence this study intends to analyze the relationships among ESG and firm performance on a sector-specific level.

1.3 RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

The study focused on ESG and the performance of firms specifically, aims at:

1.   Examining the relationships among ESG and financial performance in Europe.

2.   Impact of each ESG Dimension on firm performance in Europe

3.   Investigate the sector-specific relationship between ESG and firm performance in Europe

Since this research is developed to help understand ESG and firms' performance, the research questions of this study are:

1.   What are the relationships among ESG and firm performance?

2.   How do the different ESG dimensions associate with firm performance?

3.   Does the relationship between ESG practices and financial performance vary across different sectors?

With the outline questions above, the research seeks to answer these questions and also make recommendations to organizations on the importance of adopting ESG and the importance of being transparent with ESG reports.

1.4 SIGNIFICANCE OF THE STUDY

This research is novel and contributes to the knowledge and discussion of ESG and firm performance, that they have a bidirectional relationship. It appeals to investors, scholars, decision-makers, and stakeholders who examine the impact of ESG practices on a company's financial performance. Studying various sectors allows for a comparison between the sectors with the highest and lowest performance in terms of socially responsible practices. Moreover, it enables a comparison of individual companies against benchmarks. Through panel data and correlation analysis, the value of investing in ESG practices can be evaluated. However, it is important to note that the findings suggest that using different metrics to measure both ESG practices and financial performance may lead to varying conclusions.

1.5 DEFINITIONS OF KEY CONCEPTS

Firm performance is a set of financial and non-financial performance indicators that offers information about a company (Lebans and Euske, 2006). It is an important aspect of an organisation, as it gives management invaluable information to monitor the progress of the company (Waggoner, Neely & Kennerley, 1999). A financial performance measure gives

grounds for comparison among firms. There are different financial measures within which a firm's performance can be measured. For example, Sales Margin, Liquidity Ratio, Sales growth, Return on Assets (ROA), Return on Equity (ROE), Market Capitalization (Mcap), and Tobin Q. Non-financial performance measures include customer satisfaction, customer retention and brand preference. Other financial performance models include Balance Score Card (BSC), and The Malcolm Bridge Model.

1.6 OUTLINE OF THE THESIS

The research is organized into five chapters. Chapter One is the introduction of the research, which offers the background of the study, the research problem identified from prior literature, the research objectives and questions, the significance of the study, its limitations as well as the organization of the study. Chapter two reviews the relevant theories for the study and prior literature. Chapter three talks about the methods adopted in the research process. Chapter four talks about the data analysis process and discussions of the findings and chapter five talks about the summary of the findings and the objectives of the study. It is the concluding chapter of the study.

2.0 LITERATURE REVIEW

2.1. OVERVIEW OF ESG PRACTICES

ESG, which is a term used by companies in their Corporate Social Responsibilities (CSR) has recently gained attention from both academia and professionals as now stakeholders are becoming increasing concern about the impact of companies on the environment within which they operate and their long-term value. It underscores how firms make use of their resources outside the generation of profit such as human rights, community engagement and relations as well as carbon footprint and emissions. Masud et al. (2019) define it as the creation of value for society and firms by aligning them with economic growth. According to Almeyda & Darmansyah (2019), the ESG components can be broken into three:

Environmental Disclosure: This generally measures firms' impact on the environment. It involves reporting on environmental factors such as emissions and waste management.
Social Score: This measure firms' social performance on issues such as labour, human rights, diversity, and inclusions and as well as customer satisfaction.
Governance: This has to do with the transparency of the management structure and decisions of the organization such as the board composition, and governance structure.

ESG disclosure has a lot of advantages (Koller et. al., 2019) and disadvantages (Seth et. al., 2021). Although most of the time, the cost and benefits associated with its disclosure cannot be directly obtained from the financial statement, it is increasingly gaining recognition among stakeholders. Also, ESG presents a challenge of greenwashing by companies and standardization because the different industry has different impact on the environment and society, however, the growing acceptance of it by companies and the attempts to enhance ESG disclosure are steps in the direction of a more sustainable and accountable.

2.2 RELATIONSHIP BETWEEN ESG PRACTICES AND FINANCIAL PERFORMANCE:

The connection between ESG activities and firm performance has been extensively explored in the literature over a significant period (Brooks and Oikonomou, 2018). With the increasing pressure on firms to be ethical, there is a need for firms to find a balance between being

profitable whiles being ethical and engaging in CSR activities. These have been discussed by a lot of theories.

One theory that cannot be overlooked when discussing ESG and firm performance is the legitimacy theory. Suchman (1995, p. 574) defined legitimacy theory as "a generalized 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". This argues that firms strive to gain legitimacy in the eyes of their stakeholders by making sure their activities are in line with social norms and expectations. It suggests that firms embark on ESG activities to maintain their legitimacy in the eyes of their stakeholders irrespective of the cost of these activities. And firms can or will continue to pursue legitimacy for approval from their stakeholders even if it affects their financials. This purse of appearing legitimate will be rewarded by their stakeholders by either buying or patronizing the firm's product and services or investing more into the company.

On the contrary, the Stakeholder Theory suggests that companies have a responsibility to consider the interests of all stakeholders, including employees, customers, suppliers, and the environment, beyond making a profit for their shareholders. According to stakeholder theory, ESG disclosure can help companies to better manage their relationships with stakeholders and improve their long-term performance. This theory seeks to suggest that firms only and actively engage in ESG activities to enhance organizational legitimacy and sustainability performance (Alsayegh et al., 2020), reduce the cost of debt (Atif and Ali, 2021), foster corporate real investment (Cupertino et al., 2019), positively impact organizations' reputation (Nirino et al., 2021), get easy access to equity capital markets (Bodhanwala and Bodhanwala, 2018) and ultimately improve their firm performance (Bhaskaran et al., 2020). That is, a firm will pursue ESG goals when they have made enough profit.

In addition, Voluntary disclosure which is about the provision of information by management at their discretion to stakeholders, is among the most widely used theories on corporate voluntary reporting (Nishitani et. al., 2021). This theory applies to social and environmental disclosure and it proposes that firms with good sustainability performance are motivated to provide information on their performance to increase market value (Hummel & Schlick 2016). Overall, ESG disclosure and firm performance have a relationship and effect on each other. The stakeholder theory suggests that firm performance influences ESG, and the legitimacy

theory suggests that ESG has an influence on firm performance. There is currently little empirical support for these claims because it is unclear whether or not ESG disclosures will be seen as a cost and may destroy firm value when firms are pursuing legitimacy, or whether they will be seen as a long-term investment that may pay off in the end. To fully comprehend the connection between ESG disclosure and corporate performance, more study is required.

2.3 REVIEW OF EMPIRICAL STUDIES

Several studies have examined the relationship between ESG and firm performance. A review of the literature suggests there is varying evidence of the relationship between ESG and firm performance, both positive and negative. Some found a positive relationship between ESG practices and financial performance. For example, Khan et al. (2016) found a positive relationship between ESG disclosure and financial performance measures such as return on equity and return on assets. The study also found that the quality of ESG disclosure was an important factor in determining the strength of this relationship. Also, a study by Eccles & Serafeim (2013) found that companies prioritizing sustainability outperform their long-term peers, particularly in terms of return on assets (ROA). Kotsantonis & Serafeim (2019) also found a positive relationship between ESG practices and long-term financial performance. Grewal et al. (2020) also conducted an empirical study of the global mining sector, examining the relationship between ESG performance and financial performance. They found that ESG performance was positively associated with financial performance and that this relationship was stronger in more socially responsible countries. Jo and Harjoto (2011) in their study of 458 firms and found that firms with strong corporate governance and social responsibility performance have higher firm value.

On the contrary, some studies have found a negative relationship between ESG and firm performance. For example, Giannopoulos et al.(2022) conducted an empirical investigation of Norway firms, examining the relationship between ESG performance and financial performance. They found that ESG performance hurt financial performance. Friede et al. (2015) also conducted a meta-analysis of prior research on ESG and financial performance. They found that the relationship between ESG performance and financial performance was weakly negative. Furthermore, it was found by Buallay (2018) a mixed relationship (both negative and positive) between ESG performance and different financial performance.

Also, most literature that looked at the relationships among ESG and firm performance looked at it from one way by studying the impact ESG has on firm performance, ignoring how good financial performance promotes good ESG activities by firms (Tahmid et al., 2022; Bullay, 2018). This viewpoint is also supported by the slack resources hypothesis, which states that in cases of abundant reserves, only when businesses would engage in CSR activities and may profit from improved financial performance (Waddock & Graves, 1997). For example, Balatbat, (2012) Examined the impact ESG has on the financial performance of companies listed on the Australian Securities Exchange. Ahmad et al. (2021) also examined the impact ESG has on the financial performance of 351 UK firms from FTSE250. There is little evidence of such a study in Europe (with the exceIvascu et. al.,2022; Lanjnef & Allouz). For example, Xiong et al. (2016) examined the overall and deconstructed associations between CSR-CFP in China using a two-step longitudinal approach that included cross-lagged longitudinal path analysis. They discovered a one-year lead-lag association between CSR and CFP.

Moreover, companies operating in high-risk sectors such as power generation, chemical and metal, and mining sectors often face additional costs resulting from environmental regulations and the need for social licenses to operate. These companies are highly sensitive to ESG and are expected to have higher ESG disclosure requirements compared to industries with lower environmental impact, like the service industry (Blacconiere & Northcutt, 1997; Blacconiere & Patten, 1994). Furthermore, Jo and Harjoto (2012) found that the relationship between corporate governance and corporate social responsibility (CSR) varies across different industries. This suggests that ESG disclosures and practices differ based on the industries and sectors. For instance, the oil industry, known for its high carbon emissions, is expected to have more extensive ESG disclosures compared to industries primarily involved in providing services. Therefore, it is important to consider sector-specific factors when examining the relationship between ESG practices and financial performance. Hence this study intends to analyse the relationship between ESG and firm performance on a sector-specific level.

Studying the nexus between performance and ESG cannot be conducted without considering the effect firm performance has on ESG to know how good financial performance influences ESG activities. The above literature review reveals that to date, there have been few studies investigating the relationships among ESG and a company's financial performance in Europe. Hence, this study attempts to shed light on it to help understand how ESG activities drive firm performance and how good firms performing lead to high ESG investment and ratings

	Author(s)	Country/context	Purpose	Findings
1	Almeyda & Marmansyah (2019)	G7 countries	This paper investigated the influence of the ESG disclosure score on the financial performance of firms.	(Mixed)
2	Zhou, Liu & Luo (2022)	China	This paper explored the correlation among ESG performance, financial performance, and market value of Chinese companies.	Positive
3	Lokuwadugu & Heenetigala (2016)	Austrialia	The paper examined the development of ESG reporting and performance in the mining sector in Australia.	The findings show there is a perceived pressure from stakeholders for companies to report ESG information
4	Jo & Harjoto (2011)	USA	This study investigated the effects of internal and external corporate governance and monitoring mechanisms on the choice of corporate social responsibility (CSR) engagement and the value of firms engaging in CSR activities	Positive
5	Buallay (2018)	-	This paper investigated the level of sustainability reporting (environmental, social, and governance (ESG)) and its impact on operational, financial, and market performance, focusing on a comparison between the manufacturing and banking sectors.	Mixed

6	Ruan & Liu (2012)	China	This study examined the influence of corporate environmental, social, and governance (ESG) activities on firm performance within the framework of China's top-down implementation of ESG principles.	Positive
7	Atan et al. (2018)	Malaysia	This paper examined the impact of ESG factors on the performance of Malaysian public-limited companies (PLC) in terms of profitability, firm value, and cost of capital	No Relationship
8	Pulion et al. (2022)	Italy	The paper assessed the specific effects of ESG disclosure and the three pillars (environmental, social, and governance) on firm performance.	Positive
9	Crifo et al.(2015)		This paper quantitatively assessed the extent to which social responsibility disclosure is positively associated with firm value and investment attractiveness, providing a measure of the potential rewards from such disclosures for investors.	The results demonstrate that non-financial (ESG) performance disclosure significantly affects firm valuation and investment decisions, with a notable asymmetrical effect. Investors respond more strongly to negative ESG practice disclosure compared to positive ESG disclosures.

10	Yawika & Handayani (2019)	Indonesia	This research investigated the effect of ESG performance on the economic performance in the high profile industry listed on IDX from 2015 to 2017	Mixed
11	Maji & Loha (2022)	India	The study investigated the impact of ESG disclosure on firm performance in the context of Indian firms	Positive
12	Ahmad, Mobarek & Roni (2021)	United Kingdom	The study estimated the impact of total ESG and individual dimensions of ESG on corporate financial performance using static and dynamic panel data	The results of total ESG performance indicate that ESG has a positive and significant impact on firm financial performance. However, in the case of the individual ESG performance, the results are mixed
13	Giannopoulos et al.(2022)	Norway	This paper investigated the effects of ESG initiatives on the financial performance of Norwegian-listed companies from 2010 to 2019	Negative
14	Albitar et al.(2019)	UK	This study examined the impact of Environmental, Social, and Governance Disclosure (ESGD) on firm performance (FP) in the United Kingdom (UK) both before and after the introduction of Integrated Reporting (IR).	Positive

Table 1. Summary of Literature Reviewed.

<div align="center">**3.0 DATA AND METHODOLOGY**</div>

3.1 SAMPLE AND DATA COLLECTION

The data for this study were retrieved from Refinitiv Workspace, a widely used financial data platform. Refinitiv Workspace provides comprehensive coverage of financial and ESG data for companies across various countries and sectors. In this study, data were sampled from the Refinitiv indices, focusing on the big four European countries in addition to Norway. According to the 2023 estimates by (IMF, 2023) on the list of economies in the world by nominal GDP, the big four countries: Germany, France, Italy, and the United Kingdom collectively contribute over 50% of the continent's GDP. Eurostat's (2018) estimates for the share of the EU's GDP confirmed that the big four contributed over 60% of the entire EU's GDP in 2017. Though Norway is not part of the big four, it is worth considering in addition due to its economic significance, particularly in sectors such as energy and maritime. Moreover, Norway is well known for its strong commitment to environmental sustainability and responsible governance. Statistics on Eurostat confirm that Norway is far ahead when it comes to electric mobility. In 2021 Norway had the highest share of battery-only electric cars among all passenger cars in Europe. A share of 15.5% of all passenger cars, while the second highest, Netherlands, recorded only 2.8% and the EU average standing at 0.8% (Euronews, 2023). This evidence informed the decision of selecting the big four in addition to Norway for the study. All public companies listed in these indices for each selected country were selected and their corresponding financial metrics and ESG ratings were extracted alongside. The number of companies included in each index as of May 27th, 2023, is tabulated in Table 2 below.

Table 2. Refinitiv Indices for the 5 selected countries and the number of listed companies as of May 27th, 2023

Refinitiv Indices	Number of Listed Companies
Norway	137
Germany	173
France	162
United Kingdom	299
Italy	49
Total	820

Source: *Refinitiv. (2022, May). Environmental, Social, and Governance from Refinitiv. Retrieved from refinitiv.com*

The data then had to be filtered out to only include companies that had consistently reported ESG activities from 2012 to 2021 (the 10 years of study) The 10-year period was used as most studies have employed 10 years as justification for long-term (Qureshi et. al. (2021). Of the 820 companies in the sample, 390 companies had reported consisted ESG activities throughout the study. The financial metrics data was however not consistent as we had 540, 582, 241, and 407 consistent reporting for EPS, Mcap, ROA, and ROE, respectively. The sample had to be scaled down to only include the 241 companies that have consistent metrics for all years under study. Potential outliers, which could have influenced the analysis were noticed and removed as well. After these adjustments and the removal of some potential outliers, the sample included 190 companies which give a total of 1900 firm/years observations.

Also, to help minimize the possibility of an omitted variable bias or misleading association between the dependent and independent variables, other control variables were extracted from the same platform. The firm size which was measured by the total number of employees can influence ESG score (Drempetic et al.,2019) and financial performance (Giannopoulos et al.(2022), Also leverage was controlled for as they can have an impact on ESG as found by Rahaman and Alsayegh (2021) and firm performance. Tables 3 and 4 show how the final sample is distributed among the five countries and sectors respectively.

Table 3. Distribution by country.

Country	Number of firm/year observations
France	370
Germany	290
Italy	120
Norway	100
United Kingdom	1020
Total	1900

Source: *Refinitiv. (2022, May). Environmental, Social, and Governance from Refinitiv. Retrieved from refinitiv.com* (*sampled by Author)*

Table 4: Distribution by Sector

Sector	Number of firm/year observations
Consumer Discretionary	330
Industrials	330
Materials	230
Financials	210
Consumer Staples	180
Communication Services	150
Energy	120
Utilities	120
Health Care	80
Information Technology	80
Real Estate	70
Total	1900

Source: Author's calculation

3.2 RESEARCH DESIGN AND APPROACH

The analysis employed a panel data analysis approach to examine the relationships between ESG scores and financial performance measures for companies in Germany, France, Italy, the United Kingdom, and Norway. The R programming is utilized for the regression models and estimates.

The research design incorporates the use of the Hausman Test and the PLM Test to guide the selection of appropriate models. The Hausman test was utilized to determine whether a random effects or fixed effects model was more suitable, while the PLM Test helped to assess the presence of individual and time effects. These tests played a crucial role in specifying the suitable models to be employed, ensuring the robustness and validity of the empirical analysis.

It's crucial to consider the possibility of heteroscedasticity in panel data analysis, where the variance of the error term may differ across individuals or periods. The study then tries to reduce the potential bias and inefficiency in the estimation brought on by heteroscedasticity by using the heteroscedasticity-consistent (HC) estimator by Arellano (1987). The robust standard errors that the estimator generates, as a result, give more accurate estimates of the coefficients, t-statistics, and hypothesis tests, improving the validity of the statistical inferences made from the panel data model.

Furthermore, year-lagged values were utilized in all the models. The effects of the variables on the dependent variable could better be comprehended by considering the potential time dynamics and persistence of the variables by using lagged values. We take into account how past values have an impact on the current result by considering lagged values of the independent variables. This method acknowledges that some variables might have a delayed impact or show a pattern over time. For instance, the ESG rating from the prior year may have a big impact on financial performance like earnings per share (EPS) and return on assets (ROA) of the current year.

To answer RQ1, panel data regression models are employed to examine the relationship between ESG practices and financial performance over a long-term period. The dependent variable in Model 1.1 is the ESG score, with financial performance metrics (EPS, ROA, log_mcap) and the control variables (size and leverage) serving as independent variables. In Models 1.2 to 1.4, each financial performance metric is treated as the dependent variable, while the ESG score in addition to the control variables serves as the independent variable.

To answer RQ2 and RQ3, the same model 1.1 is used but on the subsets of the different sectors (in the case of model 2) and countries (in the case of model 3). For objective 4, model 1.1 is re-estimated, replacing the dependent variable with the individual dimensions of ESG while the independent variables remain unchanged.

3.3 MODELS

Model 1.1: Regression Model with ESG as the Dependent Variable (Random Effects)

The null hypothesis of the Hausman test, which states that the coefficients estimated using the efficient random effects and estimator is consistent and efficient, could not be rejected (See Appendix 1 for the results). This means that the random effect could be preferred for this model. The random effects help to capture the unobserved heterogeneity across firms and years. According to the plmtest, both individual and time effects were significant. We prefered random effect because it had a better fit than the fixed effect. The model is estimated as below:

$$ESG\_it = \beta 0 + \beta 1 EPS\_it_{-1} + \beta 2 ROA\_it_{-1} + \beta 3 \log(Mcap)\_it_{-1} + \beta 4 size\_it_{-1} +$$
$$\beta 5 leverage\_it_{-1} + \alpha\_i + \gamma\_t + \varepsilon\_it \ldots .. (1.1)$$

In this model, ESG_it represents the ESG score for each company i at time t. EPS_it_{-1}, ROA_it_{-1}, and $\log(Mcap)\_it_{-1}$ are the lagged values of the independent variables. The coefficients ($\beta 1$, $\beta 2$, $\beta 3$) represent the impact of each independent variable on the ESG score, considering the random effects. These coefficients provide insights into the association between financial performance metrics (EPS, ROA, log(Mcap)) and the ESG score while controlling for individual and time effects.

Where:

α_i = the random effect for the firm-specific intercept,

γ_t = the random effect for the year-specific intercept

ε_it = the error term.

Model 1.2: Regression Model with EPS as the Dependent Variable (Random Effect)

This regression analysis was conducted using the random two-way effect approach. The model includes the lagged values of the ESG score as the independent variable with size and leverage as control variables. The regression model is expressed as follows:

$$EPS\_it = \beta 0 + \beta 1 ESG\_it_{-1} + \beta 2 size\_it_{-1} + \beta 3 leverage\_it_{-1} + \alpha\_i + \gamma\_t + \varepsilon\_it \ldots .. (1.2)$$

Model 1.3: Regression Model with ROA as the Dependent Variable (Random Effect)

This model also includes the lagged values of the ESG score together with the control variables as the independent variables. The regression model is expressed as follows:

$$\text{ROA\_it} = \beta 0 + \beta 1 \text{ESG\_it}_{-1} + \beta 2 \text{size\_it}_{-1} + \beta 3 \text{leverage\_ it}_{-1} + \alpha\_i + \gamma\_t + \varepsilon\_it \dots\dots (1.3)$$

Model 1.4: Regression Model with Mcap as the Dependent Variable (Random Effect)

This model included the ESG score as the independent variable. The random two-way effect was also used to estimate this model. although according to the Hausman test, the fixed effect was preferred. After estimating the fixed effect model, the adjusted R-square turned out to be an indication of a poor fit. The next alternative, the random effect was then utilized. The regression model is expressed as follows:

$$\text{Mcap\_it} = \beta 0 + \beta 1 \text{ESG\_it}_{-1} + \beta 2 \text{size\_it}_{-1} + \beta 3 \text{leverage\_ it}_{-1} + \alpha\_i + \gamma\_t + \varepsilon\_it \dots\dots (1.4)$$

In Models 1.2 to 1.4, the coefficient $\beta 1$ represents the effects of ESG practices on the respective dependent variables while controlling for company size and leverage.

Models for RQ2 and RQ3

Model 1.1 is exploited further to answer RQ2 and RQ3, which focuses on Sector-specific, country-specific, and ESG dimensions differences in the relationship between ESG practices and financial performance. For objective 2, the data is subset into 5 main sensitive sectors namely: Energy, Materials, Financials, Health care, and Industrials. The model is then run for each of these subsets. The same procedure is done for objective 3 which focused on the five countries. For the last objective, the same model 1.1 was utilized. However, the data remained the same (Norway subset) while changing the dependent variable to contain each component of the ESG, namely: Environmental, Social, and Governance

3.3 VARIABLES DESCRIPTION

Table 5 outlines the definitions of these variables, setting the stage for the subsequent analysis and interpretation of our empirical findings.

Table 5: Definitions of Variables

Variable	Name	Description
ESG	Environmental, Social, and Governance combined score	It is a score based on self-reported information in the environmental, social, and corporate governance scores. Score

		weights are normalized in percentages ranging from 0 to 100. The same applies to all the 3 dimensions
E_score	Environmental pillar score	It measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. Major metrics include resource use, emissions, and innovation.
S_score	Social score	It measures a company's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices. Major metrics include workforce, human rights, community, and product responsibility.
G_score	Governance score	It measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. This pillar focuses on these metrics: management, shareholders, and CSR strategy
EPS	Earnings per share	Total earnings divided by the number of outstanding shares
ROA	Return on Assets	Total earnings divided by total assets
Mcap	Market capitalisation	Market price per share multiplied by total shares
Log_mcap	Natural logarithm of Mcap	The natural logarithm of Mcap
size	Number of employees as a proxy for size (control variable)	Represents the number of full-time employees, as reported, as of the fiscal period end date.
leverage	Leverage (control variable)	Total debt over total equity

Source: *Refinitiv. (2022, May). Environmental, Social, and Governance from Refinitiv. Retrieved from refinitiv.com*

<center>**4.0 RESULTS AND DISCUSSION**</center>

4.1 DESCRIPTIVE STATISTICS AND CORRELATION RESULTS

This section provides initial insight into the relationship between firms' ESG performance and financial performance which is analyzed further in subsequent sections. Table 6 presents the Pearson correlation coefficients for the descriptive variables in our study. From the table, EPS exhibits a weak positive correlation with ESG ($r = 0.173$), indicating that firms with higher earnings per share may tend to demonstrate stronger ESG performance. Additionally, a strong positive correlation is observed between log_mcap and ESG including all three dimensions, indicating that larger firms, as measured by market capitalization, tend to exhibit stronger ESG performance. This finding is consistent with the developing idea of "shared value" which encourages the simultaneous development of commercial and societal value, and it points to the potential integration of economic performance and environmental/social responsibility objectives.

On the other hand, a potential trade-off between financial performance and sustainability is also suggested by the negative correlations between ESG (including all individual dimensions), and ROA and ROE. This result is also consistent with the conflicts raised by the legitimacy theory and suggests that businesses have difficulty juggling financial goals with societal and environmental demands. The strength and significance of these findings are analyzed in detail in the following sections.

Table 6. A Pearson Correlation matrix of all variables

	ESG	E_score	S_score	G_score	EPS	ROE	ROA	log_mcap	size	leverage
ESG	1									
E_score	0.790	1								
S_score	0.860	0.627	1							
G_score	0.610	0.213	0.282	1						
EPS	0.173	0.213	0.183	-0.015	1					
ROE	-0.023	-0.039	-0.011	-0.017	0.076	1				
ROA	-0.277	-0.282	-0.237	-0.156	0.167	0.339	1			
log_mcap	0.588	0.551	0.544	0.243	0.370	0.046	-0.062	1		
size	0.530	0.507	0.512	0.210	0.288	0.0005	-0.181	0.658	1	
leverage	0.077	0.069	0.073	0.021	-0.081	-0.223	-0.265	0.020	0.005	1

Source: *Author's calculation*

In addition to examining the correlation between ESG factors and financial performance, this study also assessed the multicollinearity among the independent variables through variance inflation factor (VIF) analysis. The VIF results provide insights into the potential presence of high correlation among the explanatory variables, which could impact the accuracy of the estimated coefficients and the interpretation of the main findings.

The results of the VIF indicate that all the models demonstrate low levels of multicollinearity, as indicated by VIF values below the commonly accepted threshold of 5. This suggests that the independent variables in the models are relatively independent of each other and have minimal impact on the estimation of coefficients. Therefore, it can be inferred that the included explanatory variables in the models do not suffer from severe multicollinearity issues and therefore could be considered as reliable predictors of the dependent variable. The absence of significant multicollinearity supports the validity of the coefficient estimates obtained from the regression analyses. The results are shown in Appendix 2.

4.1.2. Descriptive Statistics

The variables examined include ESG scores, individual component scores (E_score, S_score, and G_score), financial performance metrics (EPS, ROE, ROA), market capitalization measures (Mcap and log_mcap), and the control variables (size and leverage). The descriptives are shown in Table 7 below

Table 7:Descriptive Statistics of the Sample

Statistic	N	Mean	St. Dev.	Min	Max
ESG	1,900	0.672	0.156	0.154	0.960
E_score	1,900	0.655	0.222	0.000	0.989
S_score	1,900	0.699	0.185	0.081	0.982
G_score	1,900	0.652	0.195	0.070	0.986
EPS	1,900	2.166	3.805	-35.757	61.297
ROA	1,900	0.063	0.061	-0.270	0.379
Mcap	1,900	24,146.48	34,480.40	168.467	417,159.60
log_mcap	1,900	9.298	1.300	5.127	12.941
size	980	76,543	110,495	251	672,789
leverage	1,830	1.024	1.541	0.000	23.258

Source: *Author's calculation*

The ESG scores, which capture the overall sustainability performance of the firms, have a mean value of 0.672, with a standard deviation of 0.156. Regarding the 3 dimensions, the E-score has an average of 0.655, ranging from 0 to 0.989. The S-score has an average of 0.699, with a minimum value of 0.081 and a maximum of 0.982. Similarly, the G-score has an average of 0.652, ranging from 0.070 to 0.986. These metrics provide an understanding of the overall ESG performance of the firms in the dataset.

Moving on to financial performance measures, average earnings per share (EPS) of 2.166 was observed, with a wide variation indicated by the standard deviation of 3.805. The return on assets (ROA) has a relatively low average of 0.063, with values ranging from -0.270 to 0.379. These financial indicators reflect the profitability and efficiency of the firms in the sample.

Regarding market capitalization, the figures are presented in million dollars. The mean Mcap is therefore $24.15 billion, with a significant variation as indicated by the standard deviation of $34.48 billion. The log_mcap had to be calculated because of the huge values, and it had an average of 9.298, indicating the logarithmic scale used to represent the market value of the firms.

Additionally, two control variables were included in the analysis. The size variable represents the number of employees in each firm, with an average of 76,543 and a standard deviation of 110,495. The leverage variable, measuring the level of debt, has an average value of 1.024, ranging from 0 to 23.258.

4.2 PANEL REGRESSION ANALYSIS RESULTS FOR ESG SCORE AND FINANCIAL PERFORMANCE.

4.2.1 Results of the Effects of Financial Performance on ESG

Model 1.1, which utilizes ESG as the dependent variable, employs a random two-way effects approach. Table 8 explains the relationship between ESG and lagged values of EPS, ROA, Mcap, size, and leverage. The results are presented in three columns. The first and second presents the results of the model before and after controlling for company size and leverage, while the last column presents the heteroskedasticity-consistent estimates. The results reveal several significant findings. Firstly, the variable EPS shows a positive but statistically insignificant relationship with the ESG score ($\beta = 0.001$, $p > 0.1$). This suggests that EPS may not have a significant association with ESG performance. The variable ROA demonstrates a significant negative relationship with the ESG score ($\beta = -0.394$, $p < 0.01$). This implies that companies with lower ROA tend to have higher ESG scores, indicating potential challenges in aligning financial performance with environmental, social, and governance practices. Lastly, the variable log_mcap displays a significant positive association with the ESG score ($\beta = 0.034$, $p < 0.01$). This suggests that companies with high market value, as measured by market capitalization, tend to have higher ESG scores, indicating a positive relationship between firm market value and ESG performance.

The results from Table 8 indicate that financial performance, as measured by EPS and ROA, may have limited influence on ESG scores. However, the market value of the company appears to be a significant factor in determining ESG performance.

Table 8: Regression results for the ESG model

	Dependent variable:		
	ESG		
	panel linear		*coefficient test*
	(Without controls)	(With controls)	(3)
EPS1	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
ROA1	-0.297***	-0.394***	-0.394***
	(0.050)	(0.082)	(0.134)
log(Mcap1)	0.044***	0.034***	0.034***
	(0.004)	(0.007)	(0.011)
size1		0.031***	0.031***
		(0.007)	(0.011)
leverage1		0.001	0.001
		(0.004)	(0.005)
Constant	0.289***	0.079	0.079
	(0.037)	(0.068)	(0.083)
Observations	1,710	864	
R^2	0.087	0.118	
Adjusted R^2	0.086	0.113	
F Statistic	163.286***	114.396***	

Note: Standard errors in parentheses   *p<0.1 **p<0.05 ***p<0.01

Source: Author's calculation

The findings align with previous studies that have reported both positive (Balatbat, 2012) and negative (Giannopoulos et al. 2022) associations between ESG and financial performance. According to the positive correlation between market capitalization and ESG performance, larger companies typically have stronger ESG performance, which is consistent with stakeholder theory. According to the stakeholder theory, businesses should consider the needs and interests of all their stakeholders, including investors. Larger companies frequently have a broader stakeholder base and are subject to higher investor scrutiny, which motivates them to give sustainability practices a top priority to keep stakeholder trust and draw capital. These companies are more equipped to invest in sustainable projects and adhere to ESG norms thanks to their increased access to money and resource base.

The negative correlation between ESG and firm performance also suggests the potential trade-offs between performance and sustainability. This finding implies that corporations struggle to balance financial objectives with societal and environmental concerns and is also consistent with the conflicts identified by the legitimacy theory.

4.2.2 Results for the Effect of ESG on Financial Performance – EPS as the dependent variable

Model 1.2 explore the relationship between ESG and individual financial performance measures, focusing on EPS as the dependent variable. The results from the first column of Table 9, the model without control variables, show that there is a significant positive association between ESG scores and earnings per share (EPS). However, after holding the company size and leverage constant, it was no more significant but still with a positive slope.

Moreover, the results point out that the overall explanatory power of the model is relatively low, as indicated by the low R-squared value of 1.4%. This suggests that ESG scores explain only a small portion of the variation in EPS. The F-statistic of 6.444 is statistically significant, indicating that the overall model is significant. These findings suggest that a company's ESG rating may not have a significant association with its earnings per share.

Table 9: Regression results for the EPS model

	panel linear		coefficient test
	Dependent variable:		
	EPS		
	(Without controls)	(With controls)	(3)
ESG1	1.748**	1.046	1.046
	(0.751)	(1.398)	(1.307)
size1		0.601***	0.601**
		(0.225)	(0.269)
leverage1		-0.268	-0.268**
		(0.169)	(0.116)
Constant	0.989*	-3.674*	-3.674
	(0.566)	(2.223)	(2.395)
Observations	1,710	864	
R^2	0.003	0.014	
Adjusted R^2	0.003	0.011	
F Statistic	5.424**	12.281***	

Note: Standard errors in parentheses   *p<0.1 **p<0.05 ***p<0.01*

Source: *Author's calculation*

4.2.3 Financial Performance – ROA as the dependent variable

The results in Table 10 show a negative association between ESG scores and return on assets (ROA). The heteroskedasticity-consistent estimate of -0.052 suggests that for every unit increase in ESG scores, ROA is expected to decrease by 0.052 units. The coefficient estimate is statistically significant at the 0.01 level. The direction and slope remained almost unchanged after controlling for company size and leverage. The constant term in the model is 0.137, indicating the expected ROA when ESG scores are zero. The constant term is also statistically significant. The overall explanatory power of the model is low, as indicated by the R-squared

value of 4.1%, suggesting that ESG scores explain only a small portion of the variation in ROA. The F-statistic of 36.61 is statistically significant, indicating that the overall model is significant. This finding purports that companies with higher ESG scores tend to exhibit lower levels of profitability, as measured by ROA. This potentially could be an indicator of the short-term trade-offs between financial performance and sustainable efforts. While the timeframe allows for a longer-term perspective, it does not eliminate the possibility of short-term costs associated with adopting and maintaining ESG practices.

Companies face initial challenges and expenses when implementing sustainable initiatives. These upfront investments in ESG practices, such as transitioning to renewable energy sources, enhancing employee welfare programs, or implementing stronger governance structures, may temporarily impact profitability before the long-term benefits materialize. The negative relationship observed between ESG and ROA is consistent with prior studies such as (e.g., Giannopoulos et al., 2022; Kim and Li, 2021).

Table 10: Regression results for the ROA model

	Dependent variable:		
	ROA		
	panel		*coefficient*
	linear		*test*
	(Without controls)	(With controls)	(3)
ESG1	-0.056***	-0.052***	-0.052**
	(0.012)	(0.017)	(0.026)
size1		-0.004	-0.004
		(0.003)	(0.003)
leverage1		-0.009***	-0.009***
		(0.002)	(0.002)
Constant	0.099***	0.137***	0.137***
	(0.009)	(0.027)	(0.034)
Observations	1,710	864	
R^2	0.013	0.041	
Adjusted R^2	0.012	0.037	
F Statistic	22.045***	36.610***	

Note: Standard errors in parentheses   *$p<0.1$ **$p<0.05$ ***$p<0.01$

Source: *Author's calculation*

This result is consistent with the legitimacy theory's predictions, which hold that companies may do socially beneficial actions even if they have a negative impact on their financial performance to improve their reputation and win over the public. As a result, the findings are consistent with the idea that, in the context of ROA, there can be a trade-off between ESG performance and financial success.

4.2.4 Financial Performance – Market capitalization as the dependent variable

Model 1.4 investigates how ESG ratings affect market capitalization. In Table 11, the coefficient for ESG in column 1, without controls, is estimated to be 0.725 ($p < 0.01$), indicating that a one-unit increase in ESG scores was associated with a 0.725 increase in log_mcap. This suggests that companies with higher ESG scores tend to have larger market capitalization. However, after holding company size and leverage constant, the ESG ratings turned out to be insignificant, like the case of EPS in Table 9. The improvement in the F-statistic and R-square suggests that the overall model is statistically significant and provided valuable information in explaining the relationship between ESG ratings and market capitalization.

While ESG ratings demonstrate a significant association with market capitalization, the inclusion of control variables reveals that factors related to firm size and financial leverage exert a stronger influence. This result is in line with earlier studies that have revealed an insignificant relationship between ESG practices and market value including those by Ahmad, Mobarek & Roni (2021).

Table 11: Regression results for the Mcap model

	Dependent variable:		
	log(Mcap)		
	panel		*coefficient*
	linear		*test*
	(without controls)	(with controls)	(3)
ESG1	0.725***	0.164	0.164
	(0.141)	(0.181)	(0.370)
size1		0.434***	0.434***
		(0.045)	(0.069)
leverage1		-0.051**	-0.051
		(0.024)	(0.042)
Constant	8.838***	5.153***	5.153***
	(0.121)	(0.460)	(0.746)
Observations	1,710	864	
R^2	0.015	0.108	
Adjusted R^2	0.015	0.105	
F Statistic	26.448***	103.777***	

Note: Standard errors in parentheses   *p<0.1 **p<0.05 ***p<0.01

Source: *Author's calculation*

These findings suggest a more nuanced relationship between ESG and market value. While the analysis does not provide support for a direct impact of ESG on market value, it suggests that market value plays a role in influencing ESG performance as shown previously in Table 8. One possible interpretation is that firms with higher market value may have greater resources and capabilities to invest in ESG initiatives, leading to improved ESG performance over time, as supported by the resource-based view theory. The positive correlation between ESG and log_mcap is in line with earlier studies that have revealed a positive relationship between ESG practices and market value, including those by Zhou et al. (2022).

4.3 RESULTS FOR ESG DIMENSION ANALYSIS

The focus is placed on examining the association between each ESG dimension and earnings per share (EPS), return on assets (ROA), and market value. The results provide insights into how environmental, social, and governance factors associates with the financial performance of companies in our sample. By understanding these associations, stakeholders can gain valuable insights into the relationship between ESG practices and financial outcomes.

The results in Table 12 reveal that the environmental component of ESG has a more significant association with financial performance measures such as return on assets and market value in the selected companies compared to the social and governance components as indicated by the F-statistics. Also, the significance levels for the governance model appear to be slightly lower compared to the other ESG dimensions. This indicates that the relationship between the governance dimension and financial performance measures (EPS and ROA) may be relatively weaker or more uncertain compared to the relationships observed for the environmental and social dimensions.

The implication of these findings is that companies that prioritize and effectively manage their environmental performance are more likely to experience positive financial outcomes. This highlights the importance of environmental sustainability initiatives, such as reducing carbon emissions, implementing energy-efficient practices, and adopting environmentally friendly technologies. By doing so, companies can enhance their operational efficiency, reduce costs, and potentially attract environmentally conscious investors. On the other hand, the lower significance levels observed for the governance model suggest a relatively weaker or more uncertain relationship between the governance dimension and financial performance measures, such as earnings per share (EPS) and ROA. This indicates that while good governance practices are important, they may not have a strong association with financial performance as environmental factors do. Nevertheless, it is crucial for companies to maintain robust governance structures, transparent reporting mechanisms, and ethical business practices to build trust and credibility among stakeholders.

Table 12: ESG dimensions and their association firms' financial performance

	Dependent variable:			
	ESG Combined score (1)	E_score Environmental (2)	S_score Social (3)	G_score Governance (4)
EPS1	0.001	0.002	0.0004	0.0003
	(0.001)	(0.001)	(0.001)	(0.001)
ROA1	-0.394***	-0.805***	-0.390***	-0.242*
	(0.082)	(0.109)	(0.101)	(0.147)
log(Mcap1)	0.034***	0.054***	0.038***	0.026**
	(0.007)	(0.009)	(0.008)	(0.012)
size1	0.031***	0.028***	0.030***	0.025**
	(0.007)	(0.010)	(0.008)	(0.011)
leverage1	0.001	0.0004	-0.003	0.009
	(0.004)	(0.006)	(0.005)	(0.007)
Constant	0.079	-0.073	0.099	0.168
	(0.068)	(0.100)	(0.079)	(0.112)
Observations	864	864	864	864
R^2	0.118	0.123	0.091	0.028
Adjusted R^2	0.113	0.118	0.086	0.023
F Statistic	114.396***	120.552***	86.361***	24.923***

Note: Standard errors in parentheses   *p<0.1 **p<0.05 ***p<0.01

Source: *Author's calculation*

The result shows that firms with low returns on assets tend to have high ESG ratings which is consistent with Giannopoulos et al. (2022). However, the positive relationship between Market Capitalization means that investors reward high ESG-performing companies. This shows Europe's commitment to sustainability, and ethical business, and is reflected through activities such as the introduction of the EU taxonomy. Although this contradicts the legitimacy theory

which posits it's that firms with higher financial performance disclose more ESG information in line with societal concerns to get high ESG ratings, they are however rewarded by the investors.

4.4 RESULTS FOR SECTOR-SPECIFIC DIFFERENCES IN THE RELATIONSHIP BETWEEN ESG PRACTICES AND FINANCIAL PERFORMANCE

The following analysis examines the sector-specific differences in the relationship between key variables, including ESG scores, financial performance metrics, and market value. By focusing on different sectors, we aim to uncover any distinct patterns and insights that may shed light on the interplay between environmental, social, and governance factors and financial outcomes. This examination provides a valuable perspective on how different sectors may be influenced by ESG considerations and offers important implications for investors, policymakers, and stakeholders interested in sustainable and responsible business practices.

The impact of ROA on ESG differs across sectors. Negative coefficients are observed for ROA in all the selected sectors except Health Care. This suggests that companies with lower profitability tend to have higher ESG scores. This negative relationship is consistent with results for the entire data represented in Table 14. This suggests a potential trade-off between financial profitability and ESG performance in these sectors. This further indicates that companies with higher financial profitability may face challenges in maintaining strong ESG practices.

However, in the Health Care sector, ROA has a positive and significant association with ESG, implying that companies with higher returns on assets tend to exhibit better ESG performance. It is important to consider the unique characteristics and dynamics of the Health Care sector, which may differentiate it from other sectors included in the study. The Health Care industry often operates under stringent regulations and ethical considerations, and companies within this sector may prioritize ESG practices more prominently to align with their mission of providing quality health services and maintaining a positive societal impact. These companies may integrate sustainable and socially responsible practices into their operations, leading to a positive correlation between financial profitability (as measured by ROA) and ESG performance.

On the other hand, the consistent positive coefficients for log(Mcap) in all sectors also indicate that larger companies, in terms of market value, tend to have higher ESG scores, suggesting that market size and scale might enable companies to allocate resources toward sustainable practices and initiatives. It is worth noting that the coefficient for log(Mcap) is statistically significant in all sectors, highlighting the consistent influence of market value on ESG performance across industries. This concludes that larger companies generally have better ESG practices, regardless of industry. The Industrials sector exhibits the weakest model with the smallest F-statistic and R-square value (6.1%). Health Care stands out as a sector with a relatively higher R-square value (56.5%), indicating that financial performance variables, especially EPS and ROA, play a more significant role in explaining the variation in ESG scores within this sector.

The deviation of the findings of the Health Care sector from general trends observed in the other sectors highlights the importance of sector-specific analysis and the need to consider industry-specific factors when examining the relationship between financial performance and ESG across different sectors. In summary, these findings suggest that the association between financial performance and ESG practices varies across sectors, and additional sector-specific factors, such as industry dynamics, regulatory frameworks, and stakeholder expectations, play a crucial role in shaping ESG performance.

Table 13: Regression results for the five selected sectors

	Dependent variable:				
	ESG				
	Energy	Materials	Financials	Health Care	Industrials
	(1)	(2)	(3)	(4)	(5)
EPS1	0.018*	0.002	-0.0004	0.009*	0.003
	(0.011)	(0.004)	(0.005)	(0.005)	(0.003)
ROA1	-1.212***	-0.485***	-0.529***	0.796**	-0.299*
	(0.269)	(0.154)	(0.187)	(0.364)	(0.182)
log(Mcap1)	0.068***	0.071***	0.075***	0.062***	0.052***
	(0.009)	(0.012)	(0.012)	(0.009)	(0.013)
leverage1	0.0002	0.061***	-0.004	0.090***	-0.006
	(0.024)	(0.021)	(0.006)	(0.028)	(0.007)
Constant	0.059	0.020	-0.012	-0.021	0.186
	(0.087)	(0.108)	(0.121)	(0.101)	(0.120)
Obs	99	207	189	63	270
R^2	0.481	0.205	0.216	0.565	0.075
Adjusted R^2	0.459	0.190	0.199	0.535	0.061
F Statistic	87.097***	52.231***	50.722***	75.293***	21.473***

Note: Standard errors in parentheses *p<0.1 **p<0.05 ***p<0.01

Source: Author's calculation

4.6 ADDITIONAL ANALYSIS

Country-specific differences in the relationship between esg practices and financial performance

The country-specific analysis provides valuable insights into the relationship between financial performance variables and Environmental, Social, and Governance (ESG) scores across different countries. By examining the results for France, Germany, the United Kingdom, Italy, and Norway, we can gain a deeper understanding of the similarities and differences in the impact of financial performance on ESG practices. The main conclusions and ramifications of the country-specific analysis are examined in this summary, shedding light on how financial performance and ESG scores interact in these various national contexts.

Similarities between countries are seen in the absence of a significant association in the relationship between EPS and ESG. This suggests that ESG factors might not have a consistent effect on the financial performance of firms in these countries. Also, a pattern is seen in the positive association between log(Mcap) and ESG, which suggests that larger companies, as measured by market capitalization, typically exhibit stronger ESG performance across the studied countries.

All countries exhibit negative coefficients for ROA, indicating that companies with lower profitability tend to have higher ESG scores across the board. Additionally, all countries show positive and significant coefficients for log(Mcap), indicating that larger companies, in terms of market value, tend to have higher ESG scores across countries. In terms of the fitness of the model, Norway has the highest R-squared value (14.4%), suggesting a stronger model fit for the relationship. France shows the lowest R-squared value (4.6%), indicating that other country-specific factors might significantly shape ESG performance in this country.

In summary, the country-specific analysis reveals both similarities and differences in the relationship between financial performance variables and ESG scores. While financial performance is generally important for ESG practices across countries, there are variations in the strength and significance of these relationships. Additional country-specific factors, such as regulatory frameworks, corporate governance practices, and societal norms, are likely to shape the ESG performance of companies within each country.

Table 14: Regression results for the five countries

			Dependent variable:		
			ESG		
	France	Germany	United Kingdom	Italy	Norway
	(1)	(2)	(3)	(4)	(5)
EPS1	0.001	0.002	0.007	0.004	-0.002
	(0.001)	(0.001)	(0.005)	(0.005)	(0.018)
ROA1	-0.285*	-0.539***	-0.270***	-0.597*	-0.867**
	(0.164)	(0.160)	(0.073)	(0.352)	(0.397)
log(Mcap1)	0.026**	0.053***	0.055***	0.039**	0.047**
	(0.010)	(0.012)	(0.005)	(0.017)	(0.018)
leverage1	0.019**	0.001	-0.002	0.010	-0.020
	(0.008)	(0.015)	(0.002)	(0.013)	(0.017)
Constant	0.460***	0.223**	0.168***	0.376**	0.283*
	(0.103)	(0.108)	(0.048)	(0.171)	(0.163)
Observations	333	252	864	108	90
R^2	0.046	0.111	0.139	0.065	0.144
Adjusted R^2	0.035	0.096	0.135	0.028	0.104
F Statistic	15.919***	30.770***	138.184***	7.122	14.306***

Note: Standard errors in parenthesis.   *$p<0.1$ **$p<0.05$ ***$p<0.01$

Source: Author's calculation

5.0 SUMMARY AND CONCLUSION

5.1. SUMMARY OF KEY FINDINGS

The study analyzed the relationships between ESG and firm performance, to ascertain whether firms performing well have the resources and ability to bear the cost associated with ESG investments or whether firms engaging in ESG investment are performing well and reaping the finical benefits from these ESG investments. The study revealed that EPS and ESG had no significant relationship in both ways. That is ESG is not influenced by earnings per share and earnings per share of companies does not influence ESG disclosure and ratings by companies in Europe. In addition, ROA and ESG had a significant negative relationship in both ways indicating that firms investing in ESGs are not able to make use of their resource to generate enough revenues over the year or firms with high ESG ratings are performing badly in terms of returns on assets.

In addition, two findings are observed in the relationship between Mcap and ESG. Firstly, ESG does not have a significant impact on market value (MCAP). Secondly, market value (MCAP) has a significant impact on ESG. The positive relationship between market value and ESG could indicate that firms with higher market value may be more likely to prioritize and invest in ESG practices, possibly driven by investor demands or market pressures.

The negative relationship between ESG and financial performance, particularly in terms of ROA, could be interpreted as a short-term trade-off. This suggests that companies might incur additional costs or make investments in ESG practices that may temporarily impact their profitability. However, the positive relationship between market value and ESG indicates the potential for long-term value creation. It suggests that investors and markets recognize the importance of ESG factors in assessing the sustainability and prospects of companies. Over time, companies with strong ESG performance may attract greater investor interest and command higher market valuations, reflecting the perceived long-term benefits of sustainable practices. This observation underscores the importance of considering both short-term trade-offs and long-term value creation when analyzing the relationship between ESG and financial performance.

5.3 IMPLICATIONS FOR FUTURE RESEARCH

Future research can seek to investigate the various ESG dimensions and firm performance in the healthcare sector. The healthcare sector happened to be the only sector with a positive relationship between ESG and ROA. Further research and investigation into the specific dynamics and context of the healthcare sector could provide additional insights into the reasons behind the observed positive association between ROA and ESG in this industry. Also, inferring from the research, it is evident that ESG and firm performance do have a bidirectional relationship. The study looked at the bidirectional relationship within the context of Europe. Therefore, future research can be conducted with a focus on other developed countries with less strict regulations for ESG, as well as developing countries.

5.2 LIMITATIONS OF THE STUDY

While this project provides valuable insights into the relationship between ESG practices and financial performance, it is important to acknowledge certain limitations. Firstly, the relatively small sample size and potential data unavailability, which led to a smaller number of observations, is a major limitation of this study. The study only considers publicly traded companies in the big four nations and Norway, which may not adequately represent the variety of businesses and sectors in Europe. This limits the generalizability of the findings. Greater external validity and a clearer understanding of the connection between ESG and financial performance could come from a wider context.

Secondly, the chosen ESG measurement and scoring methodologies could be a significant additional limitation. ESG metrics and frameworks can differ greatly between sources and rating agencies, which could affect the outcomes. Lastly, despite the rigorous control for relevant variables, the presence of unobserved factors or omitted variables may still pose a limitation to this study. Industry-specific characteristics, macroeconomic conditions, and company-specific strategies, among other unobserved factors, could influence the relationship between ESG and financial performance. While efforts have been made to account for some of these factors, the potential for residual confounding remains. These limitations should be considered when interpreting the findings and applying them to broader contexts

5.4 CONCLUSION AND RECOMMENDATIONS

It can be deduced that firms with high ratings may face challenges in generating profitability due to the cost burden associated with the investment in ESG. However, investors in Europe reward and power monies to those companies to support them. But the question being considered is for how long this can be sustained and whether investors will continue to push monies into the highly ESG-rated firms which are not able to generate higher returns on their assets. And will the objective of ESG be achieved if this trend continues?

It is recommended that measures should be put in place by these lawmakers and managers embarking on ESG projects to either cut down costs or try and improve profitability as ESG investment negatively influences profitability in the short term.

REFERENCE

Ahmad, N., Mobarek, A., & Roni, N. N. (2021). Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management*, *8*(1), 1900500.

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance: The International Journal of Business in Society*, *20*(7)

Albitar, K., Hussainey, K., Kolade, N., & Gerged, A. M. (2020). ESG disclosure and firm performance before and after IR: The moderating role of governance mechanisms. *International Journal of Accounting & Information Management*, *28*(3)

Almeyda, R., & Darmansya, A. (2019). The influence of environmental, social, and governance (ESG) disclosure on firm financial performance. *IPTEK Journal of Proceedings Series*, (5), 278-290.

Arellano M (1987). "Computing Robust Standard Errors for Within-groups Estimators." *Oxford Bulletin of Economics and Statistics*, *49*(4), 431–434.

Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies. *Management of Environmental Quality: An International Journal*, *29*(2).

Behl, A., Kumari, P. R., Makhija, H., & Sharma, D. (2022). Exploring the relationship of ESG score and firm value using cross-lagged panel analyses: Case of the Indian energy sector. *Annals of Operations Research*, *313*(1), 231-256.

Blomgren, A. (2011). Does corporate social responsibility influence profit margins? A case study of executive perceptions. *Corporate Social Responsibility and Environmental Management*, *18*(5), 263-274.

Brooks, C., & Oikonomou, I. (2018). The effects of environmental, social and governance disclosures and performance on firm value: A review of the literature in accounting and finance. *The British Accounting Review*, *50*(1), 1-15.

Buallay, A. (2020). Sustainability reporting and firm's performance: Comparative study between manufacturing and banking sectors. *International Journal of Productivity and Performance Management*, *69*(3), 431-445.

Chen, L., Yuan, T., Cebula, R. J., Shuangjin, W., & Foley, M. (2021). Fulfillment of ESG responsibilities and firm performance: a zero-sum game or mutually beneficial. *Sustainability*, *13*(19), 10954.

Crifo, P., Forget, V. D., & Teyssier, S. (2015). The price of environmental, social and governance practice disclosure: An experiment with professional private equity investors. *Journal of Corporate Finance*, *30*, 168-194.

Eccles, R. G., & Serafeim, G. (2013). A tale of two stories: Sustainability and the quarterly earnings call. *Journal of Applied Corporate Finance*, *25*(3), 8-19.

Eccles, R. G., & Serafeim, G. (2013). The performance frontier. *Harvard Business review*, *91*(5), 50-60.

Euronews. (2023). Norway, Germany, UK: Which European countries have the biggest share of electric cars? Retrieved from euronews.com: https://www.euronews.com/green/2023/05/08/norway-germany-uk-which-european-countries-have-the-biggest-share-of-electric-cars#:~:text=Number%20of%20fully%20electric%20cars%20exceeds%20a%20million%20in%20Germany,)%20and%20Italy%20(167%2C213).

Eurostat. (2018, May 11). Which Member States have the largest share of EU's GDP? Retrieved from ec.europa.eu/eurostat/: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20180511-1#:~:text=With%20a%20GDP%20worth%20almost,21.3%25)%20of%20EU%20GDP.

Giannopoulos, G., Kihle Fagernes, R. V., Elmarzouky, M., & Afzal Hossain, K. A. B. M. (2022). The ESG disclosure and the financial performance of Norwegian listed firms. *Journal of Risk and Financial Management*, *15*(6), 237.

Grewal, J., Hauptmann, C., & Serafeim, G. (2020). Material sustainability information and stock price informativeness. *Journal of Business Ethics*, *171*(3), 513– 544.

Handayani, M. K. Y. (2019). The effect of ESG performance on economic performance in the high profile industry in Indonesia. *Journal of International Business Economics*, *7*(2),112-121.

Hummel, K., & Schlick, C. (2016). The relationship between sustainability performance and sustainability disclosure–Reconciling voluntary disclosure theory and legitimacy theory. *Journal of accounting and public policy*, *35*(5), 455-476.

IMF. (2023). GDP, current prices. Retrieved from imf.org: https://www.imf.org/external/datamapper/NGDPD@WEO/OEMDC/ADVEC/WEOWORLD

Ivascu, L., Domil, A., Sarfraz, M., Bogdan, O., Burca, V., & Pavel, C. (2022). New insights into corporate sustainability, environmental management and corporate financial performance in European Union: an application of VAR and Granger causality approach. *Environmental Science and Pollution Research*, *29*(55), 82827-82843.

Jo, H., & Harjoto, M. A. (2012). The causal effect of corporate governance on corporate social responsibility. *Journal of Business Ethics, 106*, 53–72.

Koller, T., Nuttall, R., & Henisz, W. (2019). Five ways that ESG creates value. The McKinsey Quarterly.

Lebas, M., & Euske, K. (2002). A conceptual and operational delineation of performance. *Business performance measurement: Theory and practice*, *65*, 79.

Liu, Y., Saleem, S., Shabbir, R., Shabbir, M. S., Irshad, A., & Khan, S. (2021). The relationship between corporate social responsibility and financial performance: A moderate role of fintech technology. *Environmental Science and Pollution Research*, *28*, 20174-20187.

Lokuwaduge, C. S. D. S., & Heenetigala, K. (2017). Integrating environmental, social and governance (ESG) disclosure for a sustainable development: An Australian study. *Business Strategy and the Environment*, *26*(4), 438-450.

Maqbool, S., & Hurrah, S. A. (2021). Exploring the Bi-directional relationship between corporate social responsibility and financial performance in Indian context. *Social Responsibility Journal*, *17*(8), 1062-1078.

Masud, M. A. K., Rashid, M. H. U., Khan, T., Bae, S. M., & Kim, J. D. (2019). Organizational strategy and corporate social responsibility: The mediating effect of triple bottom line. *International journal of environmental research and public health*, *16*(22), 4559.

Nishitani, K., Unerman, J., & Kokubu, K. (2021). Motivations for voluntary corporate adoption of integrated reporting: A novel context for comparing voluntary disclosure and legitimacy theory. *Journal of Cleaner Production*, *322*, 129027.

Nirino, N., Santoro, G., Miglietta, N., & Quaglia, R. (2021). Corporate controversies and company's financial performance: Exploring the moderating role of ESG practices. *Technological Forecasting and Social Change*, *162*, 120341.

Pulino, C.S., Ciaburri, M., Magnanelli, B. S., & Nasta, L. (2022). Does ESG disclosure influence firm performance?. *Sustainability*, *14*(13), 7595.

Refinitiv. (2022, May). Environmental, Social, and Governance from Refinitiv. Retrieved from refinitiv.com: https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

Ruan, L., & Liu, H. (2021). Environmental, social, governance activities and firm performance: Evidence from China. *Sustainability*, *13*(2), 767.

Sassen, R., Hinze, A. K., & Hardeck, I. (2016). Impact of ESG factors on firm risk in Europe. *Journal of business economics*, *86*, 867-904.

Seth, R., Gupta, S., & Gupta, H. (2021). ESG Investing: A Critical Overview. Hans Shodh Sudha

Sharfman, M. P., & Fernando, C. S. (2008). Environmental risk management and the cost of capital. *Strategic management journal*, *29*(6), 569-592.

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, *20*(3), 571-610.

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance–financial performance link. *Strategic management journal*, *18*(4), 303-319.

Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y., & Kang, J. (2018). ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. *Sustainability*, *10*(8), 2607.

APPENDIX

Appendix 1: Hausman Test Results

Dependent variable	Suitable test	Chi-square statistics	P-value
ESG model (1.1)	Random Effects suitable	3.2587	0.3534
EPS model (1.2)	Random Effects suitable	5.9335	0.1149
ROA model (1.3)	Random Effects suitable	3.2696	0.3519
Mcap model (1.4)	Fixed Effects suitable	30.475	0.000001

Source: Author's calculation

Appendix 2: *VIF results for all regression models*

Variables	Model 1.1	Model 1.2	Model 1.3	Model 1.4
EPS1	1.170			
ROA1	1.297			
Log(mcap1)	1.546			
Size1	1.379	1.126	1.122	1.054
Leverage1	1.054	1.002	1.002	1.005
ESG1		1.126	1.122	1.050
Mean VIF	1.225	1.085	1.082	1.036

Source: Author's calculation