Divergent ESG-ratings and their impact on corporate financial performance

Evidence from Europe

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Dissertation written under the supervision of Eva Schliephake

Dissertation submitted in partial fulfillment of requirements for the MSc in International Management with Major Corporate Finance, at Universidade Católica Portuguesa, and for the MSc in Business and Economics with Major Finance at BI Norwegian Business School, 31th of May 2022.

Acknowledgments

I would like to sincerely thank my supervisor, Eva Schliephake, for guidance and support in writing this thesis. I would also like to thank my friends and family for continuous support, insightful discussions, and unconditional motivation. The support and encouragement they have provided me have been crucial throughout the process of completing this semester and my dissertation.

Abstract

In recent years, stakeholders' interests in companies' socially and responsible behavior have increased significantly. The evolving focus on sustainability within the business has led to several companies implementing ESG aspects as part of their business strategy, resulting in the emergence of ESG-rating agencies. However, evaluating a company's ESG performance is not a standardized approach as each ESG-rating provider has its distinct methodology and framework. Building on the divergence between these rating agencies, this paper aims to investigate if selecting one ESG-rater versus another can impact the results and conclusions obtained in empirical analysis. To do so, this thesis examines whether and how environmental, social, and governance ratings from different ESG-rating agencies influence companies' financial performance, using a sample of STOXX Europe 600 listed companies. Based on correlation and regression analysis, this research finds support for a positive and statistically significant relationship between ESG-score and financial performance for European listed firms. This conclusion holds regardless of Refinitiv Eikon, Bloomberg, or S&P Global being the rating provider. However, the results reveal that the strength of the relationship between ESG performance and financial performance differs slightly between the providers. Moreover, the difference in the strength of influence is minimal, signifying that the results and conclusions drawn in the analysis are not significantly dependent on the chosen ESG-rating provider.

Abstract

Nos anos recentes, o interesse dos stakeholders relativamente aos comportamentos socialmente responsáveis das empresas aumentou significativamente.

O referido acréscimo do foco no business *sustentability* tem levado a que várias empresas incorporem fatores ESG nas suas estratégias de negócio. O renovado interesse levou à emergência das agências de rating ESG. Contudo, a avaliação da performance ESG de uma empresa não está padronizada dado que cada agência de rating ESG utiliza metodologias e estruturas diferentes. Dada a divergência de abordagens entre agências, este estudo tem como propósito investigar caso a seleção de uma particular agência de rating ESG poderá ter impacto nos resultados e conclusões resultantes de uma análise empírica.

Esta tese examina se, e de que forma, os ratings atribuídos pelas diferentes agências de rating ESG a fatores ambientais, sociais e de governação influenciam a performance financeira de uma empresa. A análise foi realizada utilizando uma amostra de ações cotadas do Índex STOXX Europe 600. Através de análise de correlações e de regressões lineares, este estudo encontra uma relação positiva estatisticamente significante entre a pontuação ESG e a performance financeira. Independentemente da seleção da agência - Refinitiv Eikon, Bloomberg ou S&P Global - esta descoberta é observável.

Os resultados do estudo revelam, também, que a correlação entre a pontuação ESG e performance financeira de uma dada empresa difere ligeiramente entre agências. No entanto, as diferenças nos valores são residuais e, como tal, os resultados e inferências derivadas da análise não são dependentes da seleção de uma particular agência de rating ESG.

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List of Abbreviations

CFP – Corporate Financial Performance
CSP – Corporate Social Performance
CSR – Corporate Social Responsibility
ENV – Environmental pillar
ESG – Environmental, Social, and Governance
FP – Financial Performance
GOV – Governance pillar
ICB – Industry Classification Benchmark
ROA – Return on Assets
SOC – Social pillar
SRI – Socially Responsible Investment

1.0 Introduction

In the last decades, interest in the Corporate Social Performance (CSP) of companies has increased among firms and investors (Halbritter & Dorfleitner, 2015). The increased focus has led to Corporate Social Responsibility (CSR) becoming an essential part of the corporate strategy of firms (Escrig-Olmedo et al., 2019). As a result, Environmental, Social, and Governance (ESG) ratings have become a common benchmark to assess corporations' responsible and sustainable behavior (Berg et al., 2022). Because of the increasing interest in ESG-matrices as a measurement for company sustainability, various ESG-rating agencies' have appeared and are anticipated to grow even further in the following years (Dimson et al., 2020). However, despite its diligent use, critiques have been raised because of the ESG-measurements' lack of consistency across rating agencies (Dimson et al., 2020).

As a result of the growth in sustainable investing, the use of ESG-ratings in empirical analysis and financial decision-making is increasing (Christensen et al., 2022). Several studies investigate the relationship between Corporate Financial Performance (CFP) and ESG-rating. However, the debate among researchers remains unsettled as the studies provide contradicting evidence (Awaysheh et al., 2020). Following the lack of consensus in the literature, this paper aims to understand what drives the contradicting results. By comparing how ESG-scores from different ESG-rating providers affect the financial performance of companies, this thesis seeks to find out whether the choice of ESG-rating provider can impact the results of an analysis. As such, this thesis aims to answer the following two-part research question:

> *"Whether and how environmental, social, and governance ratings from different ESG-rating agencies influence companies' financial performance."*

This paper contributes to the existing literature by providing evidence that combines an empirical analysis of ESG-ratings predictiveness on CFP with an assessment of whether the results are dependent on the chosen ESG-rating provider. The thesis adds to the literature gap with observations of the financial effect caused by sustainability ratings and how the analysis depends on the chosen rating agency. By investigating the problem using a sample of European listed companies, this paper finds support for a positive relationship between ESG-score and CFP. This result is not dependent on the selected rating agency; however, the strength of the

relation between ESG performance and financial performance varies slightly across ESG-rating providers.

The data sample used in this thesis is limited to the European market because of its dominant position within ESG (Bloomberg, 2021). In recent years, the European Commission has imposed both voluntary and mandatory standards to promote CSR in the European region (EC, 2021). Assuming that these standards have contributed to a rising level of available ESG-data, this should ensure a sufficient number of observations for the data sample. As a result, the scope of this thesis is extended, increasing its explanatory value. Moreover, the following part of this paper develops as follows. The first section provides an overview of current literature on the topic and well-established theories within the field, followed by hypothesis building. The second part explains the model building and methodology, accompanied by a data set description. Lastly, the third part discusses the empirical findings in light of existing literature, followed by an assessment of the study's limitations and the conclusion of this research.

2.0 Literature Review

In recent years, the extent to which corporations enhance or undermine social welfare has become an essential question among firms and investors (Gillan et al., 2021). As a result, activities towards a sustainable direction have increased and are often referred to as ESG or CSR-related actions (Gillan et al., 2021). The growing demand for information concerning companies' ESG performance has led to the emergence of several ESG metrics (Kotsantonis & Serafeim, 2019). In response, an increasing number of studies have started to investigate the financial effects of a firm's ESG assessment, aiming to answer whether a high ESG performance can be assessed as a cost or benefit for the company (e.g., Humphrey et al., 2012; Dimson et al., 2020).

Friedman (1962) states that the only social responsibility of a business is to ensure profit maximization for shareholders without deception or fraud. Friedman (1970) further argues that spending a company's resources on the general social interest is unjustifiable and reduces returns to stockholders. Hence, this neoclassical view of the firm argues that CSR activities should not compromise with or detract from profitability (Maxfield, 2008). In contrast, Freeman (1984) argues that for a company to be successful, the company must create value for all stakeholders and not only the shareholders. Thus, for the organization to work effectively and maximize social value, Freeman (1984) emphasizes that this presupposes that all stakeholders are taken into account.

Considering the prominent focus on a company's responsibility for the social society and its stakeholders, many studies have appeared in the past years. Some of the first studies investigating the relationship between ESG criteria and CFP are traced back to the early 1970s (Friede et al., 2015). Since then, the research within the field has expanded and provided conflicting results (Gillan et al., 2021). Following the lack of a common understanding in research of ESG and CFP, the paper by Friede et al. (2015) provides an exhaustive overview of former academic studies. The article builds on the findings of approximately 2,200 individual studies. Friede et al. (2015) find that most studies identify a positive relationship between ESG and financial performance. Despite Friede et al. (2015), there is still controversy in the literature regarding the relationship between ESG and CFP. Thus, to provide an overview of the current state, the following two sections will present findings from former studies, accompanied by an introduction to some of the existing disagreements around the ESG measurement of CSR.

2.1 ESG-rating and Financial Performance

Empirical studies investigating the relationship between ESG-score and CFP lack consensus. Several studies conclude a positive relationship between ESG engagements and financial performance (Waddock & Graves, 1997; Fischer & Sawczyn, 2013; Friede et al., 2015; Velte, 2017; Alareeni & Hamdan, 2020). In contrast, some studies find either no significant relationship, a negative relationship, no linear relationship, or no relationship at all (Nollet et al., 2016; Xie et al., 2019; Duque-Grisales & Aguilera-Caracuel, 2021).

Waddock & Graves (1997) investigate the causality link between CSP and CFP in the American market. Their results find that CSP is positively associated with prior and future financial performance. Their findings support theories stating a positive relation between slack resources and CSP and good management and CSP. The former implies that slack resources lead to higher CSP, while the latter infers that high CSP results in better financial performance. In other words, Waddock & Graves (1997) find support for a relationship in both direction and presents the findings as a "virtuous circle." Building on the findings by Waddock & Graves (1997), Fischer and Sawczyn (2013) investigate the causality between CSP and CFP for German-listed firms. Similarly, their findings support a positive and significant relationship between CSP and financial performance. Besides, Fischer & Sawczyn (2013) also find evidence that the relationship is affected by the company's level of innovation.

A more recent paper by Velte (2017), investigating the link between ESG factors and CFP in the German market, finds that a company's level of ESG has a positive impact on financial performance. The article by Velte (2017) uses ESG-data retrieved from the Thomson Reuters Datastream database and finds that the positive relationship holds for the total ESG-score and its three components, the environmental, social, and governance pillar scores separately. These findings align with the article by Fischer and Sawczyn (2013), which Velte (2017) builds upon, which also finds a positive and significant relationship between CSP and CFP.

Like Velte (2017), Alareeni & Hamdan (2020) find that a company's ESG disclosure positively affects American firms' operational, financial, and market performance. The ESG-data used in the research is retrieved from Bloomberg and includes the ESG-score in total and its three sub-components. Moreover, in contrast to Velte (2017), the paper does not find evidence of a one-way relationship between the environmental, social, and governance pillars and CFP. In contrast, Alareeni & Hamdan (2020) finds that the environmental and social pillars affect CFP

positively while the governance pillar has a negative effect. Moreover, the paper's overall conclusion is that the higher level of ESG disclosure, the higher level of financial performance.

On the contrary, the paper by Duque-Grisales & Aguilera-Caracuel (2021) examines the impact of ESG performance on financial performance. Duque-Grisales & Aguilera-Caracuel (2021) find a negative linear relationship between ESG factors and CFP for companies operating mainly in Latin America. Like Velte (2017), the ESG-data is retrieved from Thomson Reuters. Moreover, the overall conclusion by Duque-Grisales & Aguilera-Caracuel (2021) supports that a high ESG score leads to worse economic performance, both for ESG in total and for the three individual pillars.

Despite positive and negative findings, Nollet et al. (2016) examine the effect of CSP on CFP for American companies and find no significant linear relationship between ESG-score and financial performance. However, the study finds a quadratic relationship, implying that CSR pays off only after a certain amount of investment and achievements have been made. In other words, before the critical point is reached, CSR investments will negatively impact financial performance. In the paper by Nollet et al. (2016), ESG-scores are used to measure CSP, and the data is retrieved from Bloomberg.

Similar to Nollet et al. (2016), Xie et al. (2019) conducted a study that found a non-linear relationship between corporate efficiency and CSR strategies. The study's ESG-data is retrieved from Bloomberg, and the findings ascertain a "U-shaped" relationship between ESG engagements and financial performance. In contrast to Nollet et al. (2016), Xie et al. (2019) find that for companies with moderate ESG-scores, ESG engagements are positively associated with financial performance. However, for companies operating with a low or high ESG-score, ESG performance harms corporate efficiency.

2.2 ESG-rating Disagreement

Investors and other financial stakeholders are becoming increasingly aware of CSR and ESG-related issues when evaluating the value of a firm (Blasco & Kind, 2017). Due to stakeholder engagements and the development of socially responsible investments (SRI), many firms implement ESG aspects as a part of their competitive strategy. As a result, there is a rise in the appearance of ESG-rating agencies' (Escrig-Olmedo et al., 2019). However, there is no standardized approach considering ESG metrics from different providers (CFA, 2022).

Consequently, ESG-ratings of companies will vary between providers due to differences in methodology, data sources, criteria, analysis, and limitations. Due to the lack of a common and consistent framework and the divergence across ESG rating agencies, investors are expressing strong uncertainty related to the true ESG profile of a firm (Avramov et al., 2021). In other words, skepticism exists about ESG-scores designated to companies and thus their applicability.

According to the ESG report conducted by Wong & Retroy (2020), investors and managers have diverse opinions about ESG-rating and the usability of the measurement. On the one hand, investors express critiques of ratings regarding inaccuracies, the use of old and backward-looking data, and the fundamental issue of whether a single score can ever measure ESG performance, among others. On the other hand, investors point out that ESG ratings have contributed to raising awareness around sustainable investing and credibility by formalizing ESG evaluation into packed products measured by the ESG-score. Thus, despite the need for improved ESG-disclosure, reporting, and transparency, the emergence of ESG-rating agencies has brought sustainability to the center of investment thinking and practice (Wong & Retroy, 2020).

Even though some investors express a lack of confidence in the ESG-rating of companies, ESG information presents itself as an additional source of intelligence that could plausibly be used to forecast future performance in combination with fundamental and technical analysis (Chatterji et al., 2009; Verheyden et al., 2016). Since the use of ESG-data in research and practice has increased, papers investigating the divergence among rating agencies are also rising. In short, most studies find that the average correlation among ESG-ratings from distinct providers is low (Dorfleitner et al., 2015; Gibson et al., 2019; Dimson et al., 2020). For instance, Dorfleitner et al. (2015) provide a comprehensive comparison of the ESG-rating approaches underlying the ESG-scores provided by Bloomberg, ASSET4 (today: Refinitiv Eikon), and KLD. According to the study, there is an evident lack of convergence among the different ESG measurement approaches. In accordance with Dorfleitner et al. (2015), Gibson et al. (2019) investigated the disagreement among six rating agencies and found an average correlation between the providers of 0.46. According to Asuero et al. (2006), this correlation strength is considered low, confirming the existence of disagreements among the rating agencies.

Besides investigating the correlation between ESG-ratings, several papers also analyze the limitations, underlying drivers, and divergence of and between ESG-ratings (e.g., Chatterji et

al., 2009; Chatterji et al., 2016; Berg et al., 2022; Christensen et al., 2022). Former research, such as Chatterji et al. (2009), assesses how well environmental and social ratings capture the CSR level of a company by investigating ratings from KLD. Chatterji et al. (2009) conclude that the validity of ratings is generally low because of the subjective part that plays a role when evaluating a company. More recent research by Chatterji et al. (2016) reaches the same conclusion regarding validity. However, Chatterji et al. (2016) extend the analysis by looking at six different rating providers. The authors find a low agreement among the rating agencies and argue that the lack of consensus is the source of low validity. Moreover, Chatterji et al. (2016) further state that each rating can be a useful measure. However, this requires awareness of each provider's underlying methodology and definitions.

Lastly, Berg et al. (2022) investigate the drivers behind the ESG-rating divergence. Berg et al. (2022) find that most of the variation between ESG-ratings is caused by each rating agency's own set of indications when measuring sustainability. In other words, there is no standardized approach when measuring ESG. In addition to measurement divergence, Berg et al. (2022) also find the attributes (different categories of sustainability) and the weighting given to each attribute as essential sources of divergence. In addition to the findings by Berg et al. (2022), Christensen et al. (2022) find the level of ESG reporting as a source of ESG-rating disagreements. To summarize, prior studies give insight into the concern of not having one common framework among the providers of ESG-scores by elucidating the differences among the used methodologies.

3.0 Theory

This thesis investigates the relationship between ESG-rating and financial performance in the light of two of the most eminent and contradictory theories on companies and businesses, namely shareholder and stakeholder theory. The next part will discuss how ESG engagements are perceived and, to some extent, justified in the view of the two conceptually contradicting approaches and how it relates to the research topic.

3.1 Shareholder versus Stakeholder Perspective

Shareholder theory, introduced by Friedman (1962), states that the social responsibilities of businesses are to maximize shareholder return and follow the wishes of the shareholders while obeying the framework of the law (Carson, 1993). Friedman further argues that CSR is not in the interest of shareholders (Smith, 2003). Moreover, according to the business case for CSR, one can argue that if the benefit for the corporation exceeds the costs of the CSR activity, the investment can be justified (Barnett, 2007). However, the article by Barnett (2007) further argues that there is no method to conclude whether a one-dollar investment in social welfare initiatives has a higher or lower return than the corresponding dollar as a benefit to the shareholder. Thus, according to Barnett (2007) and the shareholder perspective, investing in CSR can be condemned as an agency problem. According to the shareholder perspective, firms should not engage in social welfare activities because it is not necessarily in the best interest of the stockholders.

On the contrary, CSR engagement has strong support according to the stakeholder approach. A stakeholder is any group or individual who can affect or is affected by the firm (Freeman, 1984). Stakeholders, therefore, include owners, media, environmentalists, suppliers, and governments, among others. The stakeholder view claims that for an organization to be successful, it must be compatible with society's prevailing norms and ethics (Metcalfe, 1998). Therefore, satisfying stakeholders is crucial for the firm to obtain the highest social value possible, which in turn increases the financial performance. Following the stakeholder perspective and using the ESG-rating of the firm as a proxy for stakeholder satisfaction, it is possible to measure whether CSR engagement results in improved financial performance. In accordance with stakeholder theory, a high ESG score should therefore imply higher financial performance and vice versa.

4.0 Hypothesis and Methodology

Three hypotheses are developed to answer the research question: *Whether and how environmental, social, and governance ratings from different ESG-rating agencies influence companies' financial performance.* The first hypothesis examines the relationship between ESG-ratings from different rating agencies. The second part investigates whether ESG-score influences financial performance. Lastly, the third segment compares the results from segment 1 and 2 and forms a deeper understanding of the analysis dependency of the chosen provider of ESG-scores.

4.1 Main Hypotheses

4.1.1 Segment 1 Correlation

Segment 1 concentrates on the lack of a universal methodology among the providers of ESG-scores. Due to the absence of a universal framework and underlying criteria for measuring a company's ESG-score, the first hypothesis states that there is no correlation between the ESG-scores and their sub-components provided by different ESG-rating companies.

> Hypothesis 1: *There is no correlation between ESG-scores from different ESG-rating providers.*

4.1.2 Segment 2 ESG-score

Previous literature has found contradicting results regarding the relationship between ESG-score and CFP. According to stakeholder theory, a company with a high ESG-score should also have a higher financial performance. Thus, the second segment hypothesizes that companies with a higher ESG-score also experience superior financial performance.

> Hypothesis 2: *There is a positive relationship between ESG-score and its sub-components and corporate financial performance.*

4.1.3 Segment 3 Comparison

The last segment considers and combines the two hypotheses already presented. Thus, the third hypothesis relies on the supposition that there is no correlation between ESG-scores from different providers meaning that the relationship between ESG-rating and financial performance will differ depending on the ESG-score provider used in the analysis.

> Hypothesis 3: *The financial effect of ESG differs significantly between providers.*

4.2 Panel Data

The complete dataset is structured as panel data because it comprises both time series and cross-sectional elements (Wooldridge, 2013). The data comprises annual observations between 2010 and 2021 for companies listed on the STOXX Europe 600 index. The sample is unbalanced due to missing observations. The absence includes a lack of observations for certain companies in some or all years.

Brooks (2008) presents several advantages of using panel data structure when performing regression analysis. Firstly, it allows for addressing a broader range of, and more complex, issues. Further, panel data can increase the number of degrees of freedom, thus the test's power by employing dynamic information on the entities in the data set over time. Thirdly, the impact of omitted variable bias can be reduced or removed through an appropriate regression model. To sum up, panel data offers a rich structure and several advantages when the data is handled optimally. The following sections will explain the models and methods used to find the most suitable regression model for the data sample.

4.3 Model Building

An appropriate model must be applied to the dataset to take advantage of a panel data's properties (Brooks, 2008). According to theory, the most common methods are pooled OLS, fixed-effects models, and random-effects models (Brooks, 2008; Wooldridge, 2013). These regression models are reflected in previous literature, where Velte (2017), for instance, uses fixed-effects regressions when measuring the effect of ESG on financial performance. In contrast, Alareeni & Hamdan (2020) and Duque-Grisales & Aguilera-Caracuel (2021) find the random-effects model more appropriate. Building upon previous literature, the regression model used in this analysis has been found by applying different models and model specifications, followed by a poolability test, Breusch-Pagan LM test, and the Hausman test.

A one-year lag is used between financial performance and the explanatory variables to evaluate the influence of ESG on CFP. Using a one-year lag is because current literature has found that ESG engagements do not necessarily lead to better financial performance immediately (Choi & Wang, 2009). The effects not occurring at once indicate that effects do not directly occur in the same period but rather in the consecutive period (Fischer & Sawczyn, 2013). Thus, in line with the literature, the independent variables and control variables of year *t* are analyzed with the

dependent variable of the year *t+1* (e.g., Waddock & Graves, 1997; Nollet et al., 2016; Velte, 2017).

4.3.1 Pooled OLS

The most prominent method for dealing with panel data is to estimate a pooled regression, thus estimating a single equation on all the data together (Brooks, 2008). Such a model would be estimated using the simple Ordinary Least Square (OLS) model. However, the OLS model has several limitations. Pooled OLS implies that all entity-specific information is pooled together without regard to individual differences (Wooldridge, 2013). In other words, pooled OLS does not allow for potential individual heterogeneity because it uses simple betas, meaning that the betas in the regression are assumed to be constant throughout all times (Hill et al., 2011). Pooling the data implicitly assumes that the average values of the variables and the relationship between them are constant over time and across sections when this is not necessarily the case (Brooks, 2008). Moreover, provided that the underlying assumptions of OLS hold, the regression equation for the pooled OLS is shown below, where financial performance (FP) is measured by the dependent variable return on assets (ROA).

$$FP_{i,t+1} = \alpha + \beta_1 ESG_{i,t} + \beta_2 size_{i,t} + \beta_3 leverage_{i,t} + \beta_4 risk_{i,t} + u_{i.t}$$

4.3.2 Fixed Effects

The fixed-effect model is obtained by allowing the intercept to vary across entities. The model assumes that omitted variables vary across entities but do not change over time. The fixed-effects model controls this in the regression using different intercepts, one for each entity (Stock & Watson, 2020). Therefore, the fixed-effects model's advantage is that the sample's heterogeneity is considered since the behavioral differences between the entities are assumed to be captured in the intercept (Hill et al., 2011). Furthermore, it is essential to specify that the variation across time is still not accounted for in the model, only the omitted impact that is continuous across periods. The equation for the fixed-effect model is shown below, where α_i is the intercept representing each entity and the country and industry variables are dummies:

$$FP_{i,t+1} = \alpha_i + \beta_1 ESG_{i,t} + \beta_2 size_{i,t} + \beta_3 leverage_{i,t} + \beta_4 risk_{i,t} + \beta_5 industry_{i,t} + \beta_6 country_{i,t} + u_{i.t}$$

To determine whether a fixed-effects model is a better approach than pooled OLS, a poolability test is conducted (Kunst, 2009). The test is a joint F-test that checks whether the fixed-effects coefficients in the fixed-effects model are equal to zero. That is to say; the poolability test examines the presence of individual effects (Kunst, 2009). In other words, the test has the

pooled OLS under the null hypothesis and the fixed-effects model under the alternative hypothesis.

4.3.3 Random Effects

A further extension of the regression model includes random effects, thus obtaining a random-effects model. Like the fixed-effects model, the random-effects model assumes that the individual variation among entities is captured by the intercept (Brooks, 2008). However, the random-effects model presumes that the data sample is randomly selected. A randomly selected dataset would imply that the individual differences are random rather than fixed (Hill et al., 2011). For that reason, the model decomposes the intercept term into two parts: one fixed part representing the population average (α) and one random part which exhibits the individual random differences from the population average (a_i). Consequently, the regression equation for the random-effects model is shown below:

$$FP_{i,t+1} = [\alpha + a_i] + \beta_1 ESG_{i,t} + \beta_2 size_{i,t} + \beta_3 leverage_{i,t} + \beta_4 risk_{i,t} + \beta_5 industry_{i,t} + \beta_6 country_{i,t} + u_{i.t}$$

Even though the panel data is not randomly selected, it is essential to consider the occurrence of random effects in the sample. The Breusch-Pagan LM test is performed to assess the occurrence. The test ascertains the instance of randomness and thus whether the random-effects model is more appropriate than the pooled OLS model. The test is a chi-squared test for heteroscedasticity (Wooldridge, 2013). The null hypothesis states that the data is homoscedastic, meaning the error component has a constant variance (Brooks, 2008). There are no individual differences and no heterogeneity in such a case. Therefore, such a case would imply that a pooled OLS is preferred (Hill et al., 2011). On the contrary, the alternative hypothesis state that the data is heteroscedastic and that the residuals have different variances. Under those circumstances, the Hausman test determines whether a fixed or random-effects model will be more appropriate to the dataset.

4.3.4 Hausman Test

The Hausman test is conducted to decide whether to apply the random or fixed-effects model (Hill et al., 2011). The test investigates if there is a correlation between the unique errors (a_i) and their regressors. Accordingly, the test compares the coefficient estimates from the random-effects model to those from the fixed-effects model (Hill et al., 2011). The null hypothesis states that there is no correlation between the error components and regressors. As a result, the random-effects model is preferred. On the other hand, the alternative hypothesis indicates a

correlation between the error components and regressors, resulting in the preferred model being the fixed-effects model. In such a case, the fixed-effects model will be preferred because a correlation between a_i and any of the explanatory variables will cause the random-effects component to be inconsistent. In contrast, the fixed-effects estimator stays consistent (Hill et al., 2011).

4.4 Validity

The following section encounters potential issues that could threaten the model's reliability and briefly discusses how this affects the regression analysis results. The presence of endogeneity due to omitted variables, simultaneous causality, or selection bias is addressed. In addition, the probability of multicollinearity in the sample is investigated.

4.4.1 Omitted Variables

Omitted variable bias occurs when a relevant variable is excluded from the regression analysis, leaving the included variables biased and inconsistent (Brooks, 2014). The variable becomes biased because excluding an important variable could result in other variables being assigned more impact and relevance than they truly have. As a result, the output becomes biased. In this research, the explanatory variables are chosen based on existing literature. However, several studies also include, for instance, R&D expenditures as a control variable to account for technological knowledge (e.g., Nollet et al., 2016; Velte, 2017; Xie et al., 2019). The argument for including the R&D expenditures as a parameter is that technology is closely related to the firm's growth (Kogut & Zander, 1992). Therefore, the R&D expenditures serve as a known source of financial competitive advantage and profitability (Nobelius, 2004; Elsayed & Paton, 2005). However, although several studies include R&D as a control variable, the parameter is insignificant in most cases (e.g., Nollet et al., 2016; Xie. et al., 2016). Furthermore, due to the lack of observations substantiated by its low significance level in previous studies, R&D expenditures are excluded from the regression analysis. Therefore, the omission of the variable is an example of a potential source of omitted variable bias.

4.4.2 Selection Bias

Selection bias arises from an endogenous sample selection, a nonrandom sample selection where the selection criterion is based on the dependent variable (Wooldridge, 2013). Selection bias occurs when a selection process influences the availability of data and when this selection process is linked to the response variable of the sample. As a result of such bias, the OLS

estimator becomes biased (Stock & Watson, 2020). The selection bias problem might be present in the dataset used in this research because the observations are not randomly selected. The dataset is based on companies listed on the STOXX Europe 600 index and the availability of ESG-data.

The availability of ESG-data poses an issue in the analysis because it could lead to missing values for companies with lower ESG-rating. As a result, the data sample may be overrepresented by companies with high ESG performance. The potential source of bias is based on the idea that companies with good CSP will report more than firms with poor CSP (Fischer & Sawczyn, 2015). Further, companies with less ESG-disclosure have less basis for being allocated ESG-scores than companies with higher reporting (Christensen et al., 2022). In short, the bias occurring becomes a problem because it could lead to missing values in the dataset for companies that do not report sufficient information. Consequently, this will result in a lower representation of companies having poor ESG performance in the sample, according to Fischer & Sawczyn (2015).

The other source of selection bias is the self-selection in choosing the STOXX Europe 600 index. Restricting the sample to the index limits the number of companies included in the analysis to 600 particular firms. Even though these firms operate within Europe, there is a significant difference in reporting standards and requirements between countries and industries (Cahan et al., 2016). Thus, one can infer that the sample suffers from an overrepresentation of specific geographical areas or industries. To conclude, the final data sample is dependent on both a listening on the index and available ESG-data. Subsequently, the selection bias originating from these requirements causes the conclusions drawn from this research to be valid for the sample used but not for the entire European market.

4.4.3 Multicollinearity

A multiple regression model suffers from multicollinearity when there is a high correlation between the explanatory variables (Brooks, 2014). The presence of multicollinearity can bias the regression results and lead to imprecise estimation coefficients (Stock & Watson, 2020). For instance, a statistical consequence of multicollinearity is inflated standard errors. Such an issue can make it unfeasible to declare the significance of a variable (Siegel, 2016). In addition, multicollinearity can lead to an incorrectly high R-squared and a high model sensitivity when including or excluding variables (Sigel, 2016).

Correlation analysis and collinearity tests are performed to determine whether the dataset suffers from collinearity. Thus, to check for collinearity, the Pearson correlation matrix is calculated in addition to the variance inflation factor and tolerance level. The presence of multicollinearity will be further discussed in sections 5.3.3 Correlation matrix and 6.1.2 Collinearity Test.

4.4.4 Reverse Causality

Reverse causality is when the causality goes from the explanatory variable to the dependent variable and vice versa, meaning that X cause Y while simultaneously Y cause X (Stock & Watson, 2020). This thesis investigates the influence of ESG performance on financial performance. However, studies also find evidence that financial performance influences ESG performance (e.g., Waddock & Graves, 1997; Ameer & Othman, 2012). When the causality runs in both directions, the OLS estimator becomes biased and inconsistent (Stock & Watson, 2020). Even though causality is not in the scope of this thesis, it is an essential part of the research analyzing the relationship between ESG engagements and CFP. Furthermore, to mitigate the likelihood of bias, a one-year lag is introduced in the regression analysis (ref. 4.3 Model Building).

5.0 Data

The following section explains the data sample, variables of interest, and the screening process. The first part elaborates on the choice of data and discusses the cleaning of the data sample. The second section explains the independent, dependent, and control variables used in the research. The last section provides an overview of the descriptive statistics.

5.1 Data Sample and Screening

The data used in this research is retrieved from Refinitiv Eikon and Bloomberg. ESG-scores provided by Refinitiv Eikon and company-specific information, such as financial numbers, are retrieved from the Refinitiv Eikon Terminal. Further, ESG-scores provided by Bloomberg and S&P Global are collected from the Bloomberg Terminal. Moreover, the data is collected on a yearly basis for all companies listed on the STOXX Europe 600 index for the timespan of 2010 to 2021, where a list of all constituents on the index is shown in Appendix 1: List of companies.

Due to missing ESG information, the number of observations included in the regression analysis varies between years and rating agencies. In the screening process, two outliers were removed from the dataset. These outliers were negative leverage ratios caused by a large pension payment deficit in 2011 and 2012 for Royal Mail Holdings plc. Due to governmental support, the deficit was relieved from 2013 onwards, causing the remaining data to be sufficient. Consequently, the screening resulted in an average of 497 observations each year, with companies operating in 17 different countries and 11 different industries.

5.2 Variable Description

5.2.1 ESG-scores - Independent Variable

The study's independent variable is the company ESG-score and its three sub-components, the Environmental (ENV), Social (SOC), and Governance (GOV) pillars. Table 1 provides an overview of the different providers used in this study, their rating scale and component structure, as well as the source used to collect the data.

Rating agency	Scoring	Components	Source
Refinitiv Eikon	0-100	ESG, ENV, SOC & GOV	Refinitiv Eikon
Bloomberg	0-100	ESG, ENV, SOC & GOV	Bloomberg
S&P Global	0-100	ESG, ENV, SOC & GOV	Bloomberg

Table 1: Overview of ESG-rating agencies

As illustrated in Table 1, the ESG-data from Refinitiv Eikon, Bloomberg, and S&P Global will be used as the independent variable in this research. Since the rating agencies have distinct

methodologies, the underlying framework for each ESG measure differs. However, all rating providers use a scoring system ranging from 0 to 100. 0 indicates that the company does not make any disclosure or attempts in the category, while a score of 100 indicates transparency and effort. Moreover, a common denominator for all providers is that the value of a company's ESG-score is a weighted sum of the three components: ENV, SOC, and GOV. The three pillars are, in turn, a sum of underlying sub-categories which vary across the different providers. A summary presenting general information about each provider and their scores is shown in Appendix 2: Summary of ESG-rating providers.

5.2.2 Financial Performance - Dependent Variable

For this research, ROA is chosen as the indicator for financial performance. ROA as a measurement will serve as a credible metric for the company's overall financial performance. ROA measures how well a company uses its assets to generate profit and is one of the most common indicators to characterize its financial performance (Minutolo et al., 2019). However, it is essential to consider and be aware that accounting-based measures like ROA could be subject to biases. A typical bias ROA could subject to is managerial manipulation and differences in accounting procedures (McGuire et al., 1988; Scholtens, 2008). Despite this, ROA is one of the most common financial performance measures and will serve as the indicator in this analysis. The variable is extracted from Refinitiv Eikon and is calculated as follows:

$$ROA(\%) = \frac{Net\ income\ before\ preffered\ dividends + (Interest\ expense\ on\ debt - Interests\ capitalized) \times (1 - tax\ rate)}{Average\ of\ last\ year's\ and\ current\ year's\ total\ assets} \times 100$$

5.2.3 Control Variables

In accordance with previous studies looking at the relationship between ESG-rating and financial performance, control variables are used to ensure the internal validity of this study. All control variables are extracted from Refinitiv Eikon and kept constant throughout the analysis to obtain comparable results. The control variables used in this study are firm size, beta, leverage ratio, industry, and country. According to previous studies, these variables can be justified and characterized as essential (e.g., McGuire et al., 1988; Alareeni & Hamdan, 2020; Velte, 2017; Nollet et al., 2016; Xie et al., 2019).

Firm size is represented by the natural logarithm of total assets and is included as the first control variable. Controlling for firm size is important because the size of a company can affect a firm's ability to sustain a competitive advantage due to economies of scale, economies of scope, and the learning effect, among others (Roberts & Dowling, 2002). For instance, as Xie

et al. (2019) argues, larger firms may benefit from economies of scale to enhance revenues. Furthermore, previous literature has found support for a positive relationship between firm size and financial performance measured by ROA (Doğan, 2013; Velte, 2017; Xie et al., 2019; Alareeni & Hamdan, 2020). Because of the latter, the firm size variable is expected to take on a positive sign in the regression analysis.

Secondly, the analysis controls for systematic and unsystematic firm risk. McGuire et al. (1988) argue that account-based performance measures such as ROA should be adjusted for risk. Therefore, each company's leverage ratio and beta are included in the regression analysis. The leverage ratio measured by total debt over total assets is included to control unsystematic risk, while the historical beta is used to control market risk (Makni et al., 2009; Fischer & Sawczyn, 2013; Velte, 2017). Moreover, studies investigating the influence of risk on financial performance find evidence of a negative relationship. For instance, Gleason et al. (2000) argue that firms with more debt in their capital structure have lower financial performance due to financial distress costs. The argumentation by Gleason et al. (2000) is in line with the trade-off theory, which states that the volatility of a firm's asset values increases with the number of liabilities (Berk & DeMarzo, 2017). In addition, existing literature finds a negative relationship between a firm's beta factor and leverage ratio on financial performance (Makni et al., 2009; Choi & Wang, 2009; Velte, 2017). Because of the findings made in previous studies, the variables controlling for risk are anticipated to affect ROA negatively.

Finally, it is essential to control for the country- and industry characteristics' impacting the accounting performance of a company (McGuire et al., 1988). Examples of relevant effects are the number of regulations affecting the particular country and industry and the current state of its life cycle, among others (e.g., Orlitzky, 2001; Liang & Renneboog, 2017). To control for the country- and industry-specific variation, variables taking the form of a dummy are included. The geographical listing of the firm is used as a basis to classify a company's associated country and represents the country dummy. On the other hand, the industry dummy uses the Industry Classification Benchmark (ICB) to categorize the relevant companies in their respective industry. ICB provides a classification structure that divides the data sample into 11 industries: technology, telecommunications, health care, financials, real estate, consumer discretionary, consumer staples, industrials, basic materials, energy, and utilities (FTSE Russell, 2022).

5.3 Descriptive Statistics

The summary statistics of the sample and the relationship between them are presented in the following section. The first part describes the composition of the sample. The second part presents descriptive statistics of the regression variables. Lastly, the third part investigates the relationship between the variables through correlation analysis.

5.3.1 Sample Distribution

Table 2 shows an overview of the distribution of observations across each sample period. The coverage period for the regression analysis varies and depends on data availability. As a result, the analysis looking at data provided by Refinitiv Eikon, Bloomberg, and S&P Global covers the periods 2010-2021, 2010-2021, and 2016-2021 respectively. The maximum number of observations included in the regression analysis is 550 and is obtained in the year 2020 from Bloomberg. On the contrary, the minimum number of observations is 318 and corresponds to the sample of ESG-data from S&P Global in 2016. Furthermore, the overall trend for all rating agencies is that the number of observations increases every year. The tendency could be explained by the increased focus on ESG-reporting and transparency. One example is the voluntary and mandatory standards aiming to promote CSR imposed by the European Commission (EC, 2021).

ESG-rating provider	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average
Refinitiv Eikon	386	398	402	406	420	435	447	483	510	532	545	**451**
Bloomberg	404	431	433	440	450	474	487	502	518	543	550	**476**
S&P Global	0	0	0	0	0	0	318	409	448	502	523	**440**
												456

Table 2: Observations across sample period

The total data sample consists of 600 companies across the European continent, where Table 3 provides an overview of the distribution of firms across countries. The complete dataset consists of 17 unique countries with various weightings when considering the number of companies per country. As illustrated in Table 3, most of the observations originate from the United Kingdom and constitute roughly 24% of the sample, followed by France, Sweden, and Germany, making up 13%, 11%, and 11%, respectively.

Each of the companies in the dataset is further categorized based on their ICB. Table 4 illustrates how the dataset is dispersed across the 11 different industry categories. The dominating industry classification is the industrials, accounting for 21% of the total sample, closely followed by the financial industry with 18%. The least represented industries in the sample are the telecommunication and the energy sector, which account for 4% and 3%, respectively.

Country	% of total sample
United Kingdom	24 %
France	13 %
Sweden	11 %
Germany	11 %
Switzerland	9 %
Netherlands	5 %
Italy	5 %
Spain	4 %
Denmark	4 %
Belgium	3 %
Norway	3 %
Finland	3 %
Poland	2 %
Ireland	2 %
Portugal	1 %
Austria	1 %
Luxembourg	1 %
Total	**100 %**

Table 3: Distribution across countries

Industry	% of total sample
Industrials	21 %
Financials	18 %
Consumer Discretionary	15 %
Health Care	10 %
Consumer Staples	8 %
Basic Materials	7 %
Real Estate	6 %
Technology	6 %
Utilities	5 %
Telecommunications	4 %
Energy	3 %
Total	**100 %**

Table 4: Distribution across industries

Due to the variety and disproportionate representation in the distribution of countries and industries, the final dataset is skewed. The final sample used in the regression analysis is based on the availability of ESG-information. Therefore, a natural assumption is that countries with stricter reporting standards and transparency will be given a higher representation in the analysis. The overrepresentation presumes that companies in countries with strict reporting requirements have more ESG-data available. The reason is assumed to be that they disclose more ESG-related information causing more companies to have an ESG-rating (Christensen et al., 2022). In addition, an underlying condition for being a part of the sample is to be listed on STOXX Europe 600 index. Moreover, these specifications can lead to a potential selection bias, as discussed in section 4.4.2 Selection Bias.

5.3.2 Regression Variables

Table 5 summarizes the descriptive statistics for all the study variables across the sample period covering the years 2010-2021. The upper part of the table provides an overview of the statistics for the total ESG-score and its sub-components (ENV, SOC, and GOV) for each rating agency (i.e., Refinitiv Eikon, Bloomberg, and S&P Global). The lower part includes statistics for the dependent and control variables used in the regression analysis.

		N	Mean	SD	Med	Min	Max
Refinitiv Eikon							
	ESGscore	5 823	62.75	18.75	66.00	1.61	95.13
	Environmental	5 943	62.60	24.93	68.16	0.00	99.14
	Social	5 943	65.14	21.96	69.86	0.74	98.63
	Governance	5 943	59.59	21.93	62.67	2.21	98.56
Bloomberg							
	ESGscore	6 273	45.15	14.86	47.05	0.00	80.82
	Environmental	6 323	30.91	20.66	32.38	0.00	83.72
	Social	6 336	28.04	15.42	28.51	0.00	84.21
	Governance	6 344	70.65	25.32	79.29	0.00	100.00
S&P Global							
	ESGscore	2 925	62.54	28.23	67.00	0.00	100.00
	Environmental	2 925	64.19	27.35	69.00	0.00	100.00
	Social	2 925	62.01	27.94	67.00	0.00	100.00
	Governance	2 925	59.77	29.94	64.00	0.00	100.00
ROA		6 697	7.10	11.87	5.58	-120.97	269.11
Beta		6 452	0.96	0.52	0.92	-3.84	7.98
Leverage		6 856	41.42	100.26	37.88	0.00	7 864.71
Size (million €)		6 861	113.65	412.99	12.33	0.004	6 397.94

N = number of observations. SD = standard deviation. Med = median. Min = minimum value. Max = maximum value.

Table 5: Descriptive statistics for all study variables

As illustrated in Table 5, the average ESG-values given by the different ESG-rating agencies differ significantly. The ESG-data provided by Refinitiv Eikon and S&P Global constitute the highest average values for most variables and the largest standard deviation. In addition, the variation in ESG performance measured by Refinitiv Eikon and S&P Global is the greatest, ranging from values close to 0 up to the maximum score of 100. Furthermore, S&P Global has the highest standard deviation on all ESG-variables, ranging from 28.23 to 29.94. In contrast, Bloomberg has the lowest standard variation across the corresponding variables spanning from 14.86 to 25.32. As the results obtained in Table 5 indicate, there is a significant difference in the scores given by the three different rating agencies. Because the agencies have considerable differences, the type of ESG-provider is assumed to impact the regression results. The influence is expected because of the notable variation in ESG-score allocation between the rating agencies.

In addition to describing the ESG-data, Table 5 also provides a convenient overview of the key statistics for the control variables. As Table 5 shows, the minimum and maximum beta of the sample are -3.84 and 7.98, respectively, with an average of 0.96. The leverage ratio and size variables have average values of 41.42 and 113.65 million, respectively. However, the standard deviation is considerably high for the leverage ratio and size variables. Besides the large standard deviation, the two variables lack symmetry and have an extensive range between the minimum and maximum values. Therefore, the variables take the natural logarithm to obtain a more normally shaped distribution.

5.3.2.1 ROA

The mean ROA is estimated to analyze the dependent variable throughout the sample period. The results obtained in Figure 1 show the average value of ROA in the period from 2010 to 2021. As Figure 1 shows, ROA has a relatively stable pattern from 2010 to 2019. However, there is a significant drop in the average value in 2020. The drop in ROA could be explained by the occurrence of the covid-19 pandemic in the first quarter of 2020.

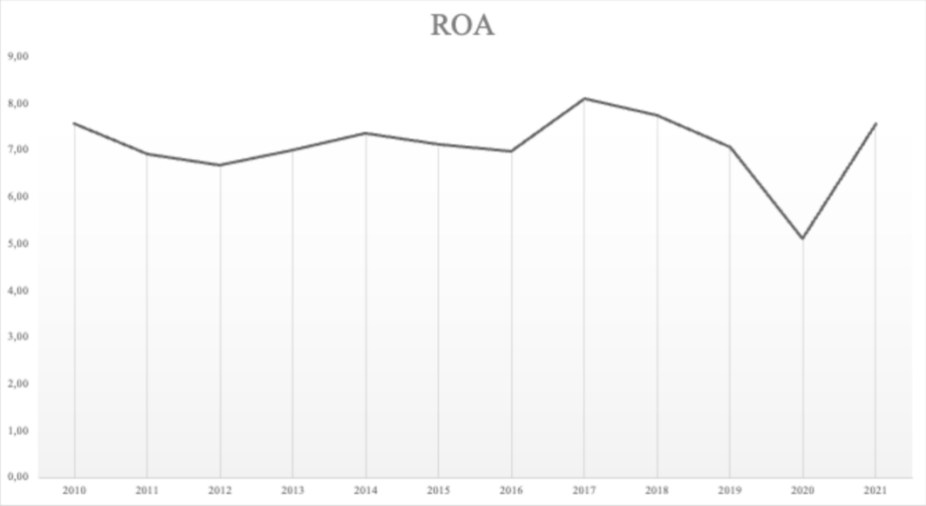

Figure 1: Average value of ROA

5.3.2.2 ESG-data

Figure 2 displays the distribution of ESG-scores provided by Refinitiv Eikon, Bloomberg, and S&P Global. As Figure 2 presents, all the distributions are left-skewed. However, the histograms show that the ESG-scores provided by Refinitiv Eikon and Bloomberg are more clustered around their mean than the scores from S&P Global.

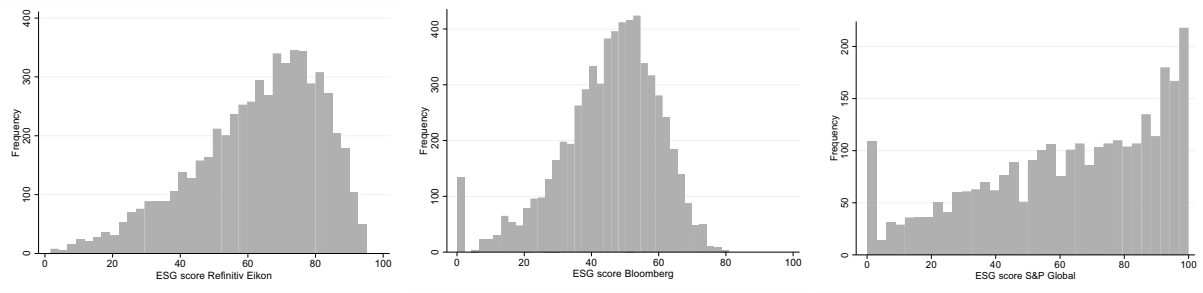

Figure 2: Histogram showing the distribution of ESG-scores for each rating agency

Extending the ESG-rating analysis, Table 6 summarizes each agency's average ESG-scores and sub-component scores across industries. As illustrated in Table 6, there is a controversy between the ESG-rating agencies concerning the average ESG-rating within each sector. For instance, Refinitiv Eikon allocates the highest average ESG-score to the telecommunication industry. Bloomberg and S&P Global, on the other hand, grant the highest score to the utilities and energy sectors, respectively. Regarding the minimum score, the three providers seem to be in agreement on having the technology industry in the lower tier. However, Bloomberg appears to issue lower ESG-scores than Refinitiv Eikon and S&P Global in general.

	Financials	Industrials	Utilities	Consumer Staples	Consumer Discretionary	Health Care
Refinitiv Eikon						
ESGscore	59.97	60.76	69.19	66.54	62.39	63.23
Environmental	63.24	60.09	73.12	68.01	61.28	54.95
Social	59.91	63.37	70.90	69.80	65.55	69.62
Governance	62.63	57.98	60.07	59.37	57.82	59.40
Bloomberg						
ESGscore	41.05	45.32	56.92	47.66	43.38	43.17
Environmental	22.91	31.50	48.32	36.94	28.22	29.09
Social	24.79	28.07	40.61	30.03	26.37	24.72
Governance	70.67	69.73	78.26	72.30	68.01	69.29
S&P Global						
ESGscore	59.66	59.91	72.57	63.80	66.47	61.89
Environmental	60.64	60.67	73.56	65.06	69.32	66.72
Social	59.31	58.45	70.15	62.31	66.22	58.83
Governance	58.27	57.69	69.89	61.81	63.21	59.16
ROA	3.35	6.81	3.83	7.55	8.95	8.70
Beta	1.22	1.02	0.75	0.71	0.99	0.67
Leverage	3.65	3.46	3.94	3.49	2.95	2.95
Size (million €)	500.34	24.41	56.22	28.68	26.02	18.09

	Real Estate	Basic Materials	Energy	Technology	Telecommunication
Refinitiv Eikon					
ESGscore	58.56	67.77	73.70	55.97	84.70
Environmental	62.44	69.09	74.35	47.94	66.36
Social	57.71	70.34	76.08	60.09	68.90
Governance	53.95	61.84	69.70	52.89	65.31
Bloomberg					
ESGscore	41.00	53.71	54.53	37.43	47.80
Environmental	24.35	44.81	45.62	19.35	32.89
Social	22.85	34.82	39.41	23.03	30.20
Governance	71.00	74.35	73.16	65.54	73.82
S&P Global					
ESGscore	64.86	63.10	73.65	58.87	58.42
Environmental	65.67	62.60	75.58	61.57	62.33
Social	62.95	63.77	74.05	60.63	60.13
Governance	61.11	62.37	66.82	54.67	52.92
ROA	12.64	7.72	3.53	10.10	5.93
Beta	0.76	1.18	0.94	1.04	0.71
Leverage	3.79	3.23	3.50	3.13	3.85
Size (million €)	18.05	32.43	124.05	8.75	74.56

Table 6: Average ESG-scores and pillar-scores across industries

The variation of ESG-scores across countries is another essential aspect to consider. Table 7

presents the average ESG-scores across the 17 countries in the data sample. As Table 7 shows, there is a considerable difference in the average ESG-scores across the different countries. For instance, Refinitiv Eikon and Bloomberg have issued the highest average ESG-score to Spain and Finland, while S&P Global has issued the highest average ESG-score to Portugal. Concerning the lower tier, the rating agencies seem to agree. All agencies have issued the lowest average ESG-score to companies based in Poland, followed by Belgium and Norway.

The most significant divergence is between the ratings provided by Bloomberg and S&P Global. The average ESG-score differs close to 30 points when looking at the mean of Portugal and the Netherlands. However, regarding the United Kingdom, which constitutes the highest percentage of the total sample, the divergence is largest between Bloomberg and S&P Global reaching close to 16 points. In other words, it seems to be a lack of consensus in the allocation of ESG-scores across countries. In addition, it is plausibly an internal dispersal between the ESG-raters within each country, meaning that the average ESG-score within a country depends on the provider. A plausible explanation for the divergence in ESG-scores can be the level of ESG-disclosure among the companies, either voluntarily or required. Christensen et al. (2022) found evidence showing that greater ESG disclosure leads to higher ESG-rating disagreements. Christensen et al. (2022) argue that this is because the increased amount of company information invokes the use of subjectivity by the rating agencies. As such, Christensen et al. (2022) find evidence that the greater ESG-disclosure from companies, the greater the disagreement among the rating agencies. Based on the findings of Christensen et al. (2022), it is plausible that companies with mandatory ESG-disclosure requirements experience a greater internal dispersion between the rating agencies. In addition, this could be a potential explanation for the variation in ESG-scores between countries.

		Refinitiv Eikon				Bloomberg				SP Global			
Country	ROA	ESGscore	ENV	SOC	GOV	ESGscore	ENV	SOC	GOV	ESGscore	ENV	SOC	GOV
United Kingdom	9.21	59.83	57.20	59.96	62.41	45.91	25.82	30.14	73.41	61.86	64.30	58.70	60.39
France	4.61	67.17	73.58	71.51	56.20	50.94	34.59	28.27	84.45	74.67	76.83	75.81	68.52
Sweden	9.53	59.87	57.55	64.82	56.82	41.16	27.91	22.11	65.76	51.22	52.21	51.11	50.05
Germany	5.50	68.43	65.20	70.61	64.30	40.70	33.25	27.43	58.94	61.46	63.40	62.10	57.65
Switzerland	7.77	59.28	57.82	61.67	58.30	43.80	32.94	23.82	66.61	61.75	64.49	61.15	57.56
Netherlands	5.08	64.43	62.74	70.17	58.75	44.64	31.25	27.65	69.41	74.51	73.31	74.53	74.22
Italy	4.70	68.96	70.68	71.62	64.42	50.98	39.81	36.27	74.08	73.29	73.68	72.65	71.67
Spain	3.93	72.78	76.99	78.37	62.07	53.84	44.64	39.96	74.29	82.42	82.08	80.67	79.53
Denmark	11.34	60.63	57.73	63.68	55.88	41.96	28.36	23.02	68.29	53.36	54.17	55.06	51.30
Belgium	5.21	50.37	55.44	49.49	50.61	39.00	19.78	22.88	72.02	44.32	47.32	47.47	41.37
Norway	6.52	63.21	61.10	65.97	62.58	38.06	27.01	24.73	59.22	42.36	45.04	42.83	38.09
Finland	7.35	66.25	73.45	65.81	57.38	54.38	43.18	33.36	77.97	65.75	65.66	63.82	65.37
Poland	7.99	50.15	45.90	49.31	54.24	28.93	19.23	19.92	46.64	29.89	33.55	38.63	22.68
Ireland	6.56	53.96	50.55	53.03	59.44	41.55	16.53	26.03	79.37	44.23	48.26	39.29	50.54
Portugal	4.49	71.89	78.58	81.58	48.73	52.58	50.13	40.37	64.34	83.39	85.11	82.05	79.00
Austria	3.57	60.03	66.48	59.46	55.01	42.43	32.69	25.54	65.55	51.32	50.96	50.85	48.21
Luxembourg	7.07	61.90	53.97	63.85	55.16	39.72	22.45	28.14	67.59	50.75	52.89	50.75	44.55

Table 7: Average ROA, ESG-scores, and pillar-scores across countries

5.3.3 Correlation matrix

Table 8 illustrates the correlation matrix examining the relationship between the dependent, independent, and control variables. From the results in the table, the correlation between ROA and the remaining variables is low. As supposed, the leverage ratio and company beta are negatively correlated with ROA. However, Table 8 also shows that the correlation between ESG-scores, firm size, and ROA is negative. According to the correlation matrix, a firm with high ESG performance should experience a lower level of financial performance. In addition, it expresses that firms of larger size should have a worse ROA.

Furthermore, there is a strong positive correlation between the ESG-score and its sub-components issued by the same provider. This relationship is highest for the ESG-data from S&P Global, where the ESG-score correlates 0.95, 0.96, and 0.95 with the environmental, social, and governance pillars, respectively. A strong relationship between these variables is expected since the three ESG-pillars are components of the total ESG-score.

	ROA	ESGscore Refinitiv	ENV Refinitiv	SOC Refinitiv	GOV Refinitiv	ESGscore Bloomberg	ENV Bloomberg	SOC Bloomberg	GOV Bloomberg	ESGscore SP	ENV SP	SOC SP	GOV SP	Firm size	Leverage	Beta
ROA	1.0000															
ESGscore Refinitiv	-0.1247*	1.0000														
ENV Refinitiv	-0.1605*	0.8178*	1.0000													
SOC Refinitiv	-0.1216*	0.8912*	0.6935*	1.0000												
GOV Refinitiv	-0.0677*	0.6864*	0.3410*	0.4106*	1.0000											
ESGscore Bloomberg	-0.0909*	0.6937*	0.6096*	0.6317*	0.4256*	1.0000										
ENV Bloomberg	-0.1057*	0.6295*	0.5932*	0.5884*	0.3101*	0.8240*	1.0000									
SOC Bloomberg	-0.0744*	0.5470*	0.4427*	0.5140*	0.3554*	0.7874*	0.7540*	1.0000								
GOV Bloomberg	-0.0376*	0.3394*	0.2438*	0.3028*	0.2774*	0.6529*	0.5111*	0.5958*	1.0000							
ESGscore SP	-0.0538*	0.6185*	0.5354*	0.5620*	0.3351*	0.5807*	0.4693*	0.4815*	0.4645*	1.0000						
ENV SP	-0.0648*	0.5974*	0.5211*	0.5410*	0.3201*	0.5717*	0.4594*	0.4605*	0.4703*	0.9471*	1.0000					
SOC SP	-0.0517*	0.5992*	0.5124*	0.5623*	0.3081*	0.5628*	0.4571*	0.4706*	0.4454*	0.9639*	0.9020*	1.0000				
GOV SP	-0.0313	0.5708*	0.4884*	0.5072*	0.3329*	0.5362*	0.4239*	0.4577*	0.4292*	0.9488*	0.8663*	0.8983*	1.0000			
Firm size	-0.2820*	0.4352*	0.4803*	0.3921*	0.2783*	0.3189*	0.3147*	0.2396*	0.1724*	0.2604*	0.2553*	0.2569*	0.2443*	1.0000		
Leverage	-0.2387*	0.2416*	0.2325*	0.1904*	0.1732*	0.1851*	0.1456*	0.1498*	0.1229*	0.2013*	0.1896*	0.1789*	0.1993*	0.3308*	1.0000	
Beta	-0.0983*	0.0827*	0.1314*	0.0403*	0.0823*	0.0398*	-0.0051	-0.0092	0.0038	0.1119*	0.0967*	0.1142*	0.1197*	0.2364*	0.0774*	1.0000

** p-value < 0.01*

Table 8: Correlation matrix

Surprisingly, the correlations between ESG-data from distinct providers turn out to be moderately correlated. The correlation between the total ESG-score from Refinitiv Eikon, Bloomberg, and S&P Global indicates a correlation ranging from 0.58 to 0.69. The most vital relationship is between Refinitiv Eikon and Bloomberg, while the weakest connection of 0.58 is between Bloomberg and S&P Global. Figure 3 shows a visual representation of the correlation between the ESG-scores and confirms the findings from the correlation matrix.

The correlation coefficients between the environmental, social, and governance pillars are positive but low to moderate. The correlation between the environmental pillar of Refinitiv Eikon and Bloomberg (S&P Global) is 0.59 (0.52). Nevertheless, the correlation of the environmental pillar between Bloomberg and S&P Global is the lowest at 0.46. Moreover, the correlation of the social pillar between the different rating providers ranges from 0.47 to 0.56,

with the most substantial relationship being the social score provided by Refinitiv Eikon and Bloomberg. Nonetheless, the correlation coefficients are generally lower for the governance score. The coefficient ranges from 0.28 to 0.43, indicating a low correlation.

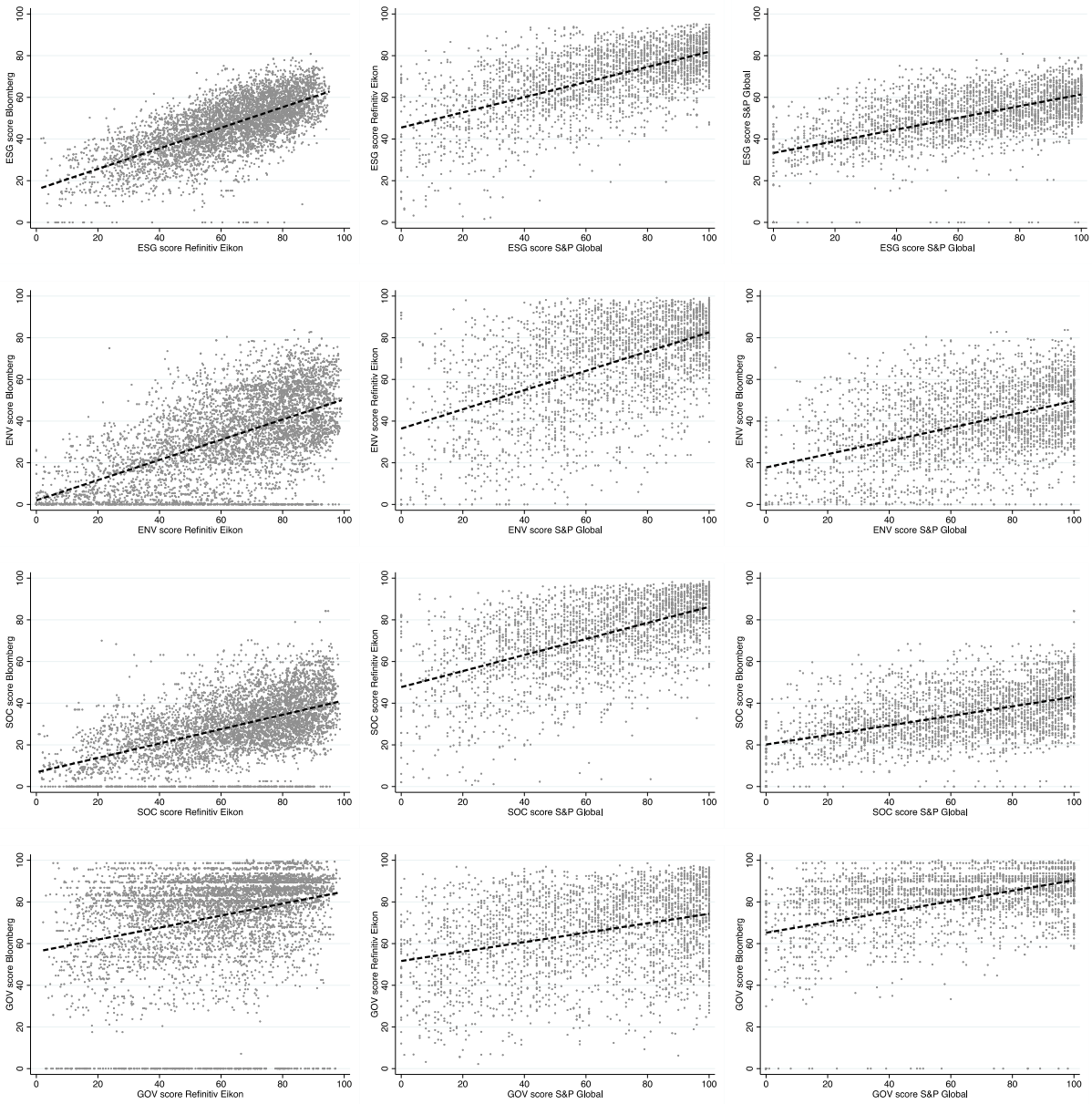

Figure 3: Scatterplots of ESG-scores

Despite the lack of a universal framework among rating agencies, there is an indication of moderate correlation between the providers. Consequently, Hypothesis 1 cannot be confirmed. These findings contradict previous literature, which finds a minimal correlation between ratings from alternative agencies (e.g., Dimson et al., 2020). However, the increased correlation among the rating agencies could be explained by an increase in companies reporting on sustainability

information (EC, 2021). Despite the lack of a common ESG-rating framework, an improvement in sustainability reporting could lead to a convergence of what is viewed as good ESG performance. In other words, if the rating agencies' view on ESG performance converges and becomes narrower due to more tangible standards, it is plausible that the agreement among rating agencies could improve (i.e., higher correlation among the rating agencies) (Christensen et al., 2022).

6.0 Empirical Findings and Analysis

After analyzing the sample distribution and descriptive statistics of the panel data, regression analysis is conducted to investigate the impact of ESG-score on the financial performance of European listed firms. The following chapter presents the choice of model used in the regression analysis, followed by the empirical findings.

6.1 Choice of Model

After model specifications and testing, the fixed-effects model turned out to be the most suitable model for the regression analysis. As explained in chapter 4.3 Model Building, the three evaluated models were pooled OLS, the fixed-effects model, and the random-effects model. Table 9 summarizes the results obtained from the model building tests. Firstly, the poolability test resulted in the preferred model being the fixed-effect model over pooled OLS. Secondly, the Breusch Pagan LM-test revealed that a random-effects model is preferable compared to the pooled OLS. Thirdly, the Hausman test was performed to determine whether a fixed-effects or random-effects model was most suitable. The result obtained from the Hausman test led to choosing the fixed-effects model as the most applicable model for the panel data. Additional details about the model building tests can be found in Appendix 3: Model building test results.

Test	Result	Preffered model
Poolability test	Reject H0	Fixed-effects model
Breusch-Pagan LM test	Reject H0	Random-effects model
Hausman test	Reject H0	Fixed-effects model

Table 9: Model building test results

The fixed-effects model is applied to the data sample, resulting in a total of 12 regression models. Models I-IV analyses the total ESG-score, environmental pillar, social pillar, and governance pillar on ROA based on ESG-data from Refinitiv Eikon. Models V-VIII analyses ESG-data from Bloomberg, while models IX-XII use data from S&P Global.

6.1.2 Collinearity Test

The Variance Inflation Factor (VIF) and tolerance level are calculated to ensure the model's validity. These tests check for multicollinearity in the data sample, which is highly relevant because of the notable correlation coefficients between several variables (Table 8). Moreover, Table 10 presents the collinearity statistics for the dependent and independent variables in the regression models, whereas Appendix 4: Collinearity statistics presents an extended overview. The results obtained from Table 10 indicate no severe problems with multicollinearity in the

dataset. The problems are not critical because the VIF is lower than 10 for all variables, indicating no need for further investigation (Kutner et al., 2005). In addition, the tolerance level, which 1/VIF measures, is higher than the critical level of 0.1, indicating that there is no cause for concern.

	Refinitiv Eikon				Bloomberg				S&P Global			
Model	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VII**	**VIII**	**IX**	**X**	**XI**
ESG Score	1.65 *(0.61)*				1.75 *(0.57)*				1.46 *(0.68)*			
Environmental		1.69 *(0.59)*				1.59 *(0.63)*				1.47 *(0.68)*		
Social			1.56 *(0.64)*				*1.40 (0.71)*				*1.41 (0.71)*	
Governance				1.19 *(0.84)*				1.21 *(0.82)*				1.38 *(0.72)*
Firm size	2.93 *(0.34)*	2.93 *(0.34)*	2.78 *(0.36)*	2.33 *(0.42)*	2.71 *(0.37)*	2.57 *(0.38)*	2.40 *(0.41)*	2.18 *(0.45)*	2.51 *(0.39)*	*2.52 (0.39)*	2.46 *(0.40)*	2.44 *(0.40)*
Leverage	1.25 *(0.80)*	1.24 *(0.80)*	1.25 *(0.80)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.22 *(0.81)*	1.22 *(0.81)*	1.22 *(0.81)*	1.22 *(0.81)*
Risk	1.21 (0.83)	1.22 *(0.82)*	1.21 *(0.82)*	1.21 *(0.82)*	1.22 *(0.82)*	1.22 *(0.81)*	1.23 *(0.81)*	1.22 *(0.81)*	1.24 *(0.80)*	1.24 *(0.80)*	1.24 *(0.80)*	1.24 *(0.80)*
Mean	**2.13**	**2.13**	**2.12**	**2.08**	**2.06**	**2.03**	**2.01**	**2.01**	**2.03**	**2.03**	**2.02**	**2.02**

Tolerance level (1/VIF) in parentheses.

Table 10: Collinearity statistics

6.2 Regression Results

The following section will present and discuss the results obtained from the fixed-effects models, investigating the impact of ESG performance on financial performance. Each regression uses the same control variables (i.e., firm size, leverage, and risk) and dummy variables (i.e., industry and country). The results are sorted by which rating agency is underlying the independent variable and are illustrated in Table 11-Table 13. The detailed overviews of the regression results are available in Appendix 5: Regression results – ESG data from Refinitiv Eikon on ROA-Appendix 7: Regression results - ESG data from S&P Global on ROA

6.2.1 ESG on FP

The results of the regression analysis reveal that there is a statistically significant and positive relationship between the total ESG-score and financial performance among all three rating agencies: Refinitiv Eikon (Model I), Bloomberg (Model IV), and S&P Global (Model IX). Reviewing Table 11, Model I, the ESG-score coefficient is positive with an estimated value of 0.045. The results indicate that when a company's ESG-score increases by one unit, the mean of the ROA increases by 0.045 percentage points. Similar results are found in Table 12, Model V, and Table 13, Model IX. The results obtained in the different models are consistent with the stakeholder theory: A company must satisfy its stakeholders to be successful (Metcalfe, 1998). In addition, these findings are in line with prior research which finds evidence for a positive relationship between ESG performance and corporate financial performance (e.g., Waddock & Graves, 1997; Fischer and Sawczyn, 2013; Friede et al., 2015; Velte, 2017; Alareeni & Hamdan, 2020).

Refinitiv Eikon				
	Model I	Model II	Model III	Model IV
Variables				
Intercept	34.13 *(2.600)***	34.55 *(2.465)***	34.19 *(2.345)***	32.60 *(2.374)***
Independent variables				
ESC Score	0.045 *(0.009)***			
Environmental		0.024 *(0.006)***		
Social			0.035 *(0.006)***	
Governance				0.015 *(0.007)**
Control variables				
Firm size	-1.541 *(0.195)***	-1.472 *(0.172)***	-1.520 *(0.165)***	-1.323 *(0.174)***
Leverage	-1.048 *(0.126)***	-0.972 *(0.127)***	-0.989 *(0.126)***	-0.992 *(0.125)***
Risk	0.015 *(0.273)*	-0.062 *(0.275)*	0.008 *(0.273)*	0.002 *(0.275)*
Industry F.E.	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes
R-squared	4 964	5 083	5 083	5 083
Adjusted R-squared	0.209	0.202	0.205	0.201
N	0.204	0.198	0.200	0.196

*Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001*

Table 11: Results from regressing ESG- data from Refinitiv Eikon on FP

The results reveal a statistically positive and significant relationship between the environmental pillar and financial performance. For Refinitiv Eikon (Table 11, Model II) and Bloomberg (Table 12, Model VI), the average ROA increases by 0.024 percentage points for every additional ESG-score unit. The effect is slightly higher for S&P Global (Table 13, Model X), whereas the coefficient estimate is 0.033. The findings obtained support the majority of prior research. According to Alshehhi et al. (2018), close to 80% of publications find support for a positive relationship between corporate sustainability and CFP. These results could plausibly be related to the research-based view (RBV) of the firm, in addition to the stakeholder perspective. The RBV states that unique resources and the ability to develop a firm's capabilities continuously are the keys to a sustained competitive advantage (Barney, 1991). Hart (1995) extended this theory and stated that implementing environmentally friendly strategies could increase the firm's capabilities and competitive advantage. Subsequently, a firm's activities towards sustainable involvement can impact the company's profitability because of the potential increase in competitiveness it might entail. Thus, since the environmental pillar captures environmental engagements, this effect might be reflected in the positive coefficient estimate.

The results obtained from the social pillar score indicate a positive and significant relationship with ROA. Given a one-unit increase in the score, the average ROA is predicted to increase by 0.035 percentage points based on data from Refinitiv Eikon (Table 11, Model III) and S&P Global (Table 13, Model XI). The effect on ROA is less for Bloomberg data (Table 12, Model

VII), whereas the coefficient estimate is 0.025. These results are in accordance with several existing studies which find a positive link between social performance and profitability (e.g., Qio et al., 2016; Busch & Friede, 2018). Furthermore, a positive association between social performance and financial performance could be explained by increased company reputation due to transparency and shareholder confidence (Armitage & Marston, 2008). Moreover, an enhanced reputation could increase the company's attractiveness, allowing them to obtain and retain superior human capital, loyalty among employees and customers, and increased sales (Qiu et al., 2016). In other words, higher social performance can lead to a superior financial performance by establishing a reputational, competitive advantage.

	Bloomberg			
	Model V	Model VI	Model VII	Model VIII
Variables				
Intercept	31.98 *(2.240)***	31.73 *(2.211)***	31.03 *(2.228)***	30.35 *(2.065)***
Independent variables				
ESC Score	0.046 *(0.010)***			
Environmental		0.024 *(0.005)***		
Social			0.025 *(0.009)***	
Governance				0.011 *(0.005)***
Control variables				
Firm size	-1.336 *(0.168)***	-1.256 *(0.155)***	-1.211 *(0.161)***	-1.169 *(0.147)***
Leverage	-1.036 *(0.122)***	-1.034 *(0.122)***	-1.039 *(0.122)***	-1.037 *(0.122)***
Risk	-0.224 *(0.280)*	-0.191 *(0.271)*	-0.244 *(0.280)*	-0.258 *(0.279)*
Industry F.E.	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes
R-squared	5 232	5 241	5 249	5 254
Adjusted R-squared	0.200	0.196	0.197	0.197
N	0.195	0.192	0.192	0.192

*Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001*

Table 12: Results from regressing ESG- data from Bloomberg on FP

Similar to the environmental and social pillar, the results indicate that the governance pillar is positively related to CFP. The variable is statistically significant for all regressions, whereas the effect of the governance pillar is the lowest compared to the environmental and social pillar. For Refinitiv Eikon (Table 11, Model IV), Bloomberg (Table 12, Model VIII), and S&P Global (Table 13, Model XII), the governance coefficient estimates are 0.015, 0.011, and 0.032, respectively. The results obtained from the three models could indicate higher ROA due to greater governance performance. These results support the study by Zagorchev & Gao (2015), who found that good governance is negatively related to risk and positively related to financial performance. Besides enhancing trust and attractiveness among investors, the positive relationship between the governance pillar and ROA could be explained by the fact that good corporate governance can improve a company's management by increasing efficiency and profitability (Wahyudin & Solikhah, 2016).

A common denominator for all the independent variables (ESG-score, ENV, SOC, & GOV) is that the analyses show a positive and significant association with CFP. Thus, according to the discussion above, the results obtained are sufficient evidence to support and substantiate Hypothesis 2.

	S&P Global			
	Model IX	Model X	Model XI	Model XII
Variables				
Intercept	38.33 *(3.920)***	37.98 *(3.908)***	37.95 *(3.803)***	38.43 *(3.889)***
Independent variables				
ESC Score	0.034 *(0.009)***			
Environmental		0.033 (0.009)***		
Social			0.035 (0.009)***	
Governance				0.032 (0.008)***
Control variables				
Firm size	-1.742 *(0.256)***	-1.730 *(0.256)***	-1.731 *(0.244)***	-1.728 *(0.251)***
Leverage	-1.052 *(0.194)***	-1.040 *(0.193)***	-1.044 *(0.193)***	-1.059 *(0.194)***
Risk	0.496 *(0.494)*	0.523 *(0.496)*	0.469 *(0.493)*	0.480 *(0.494)*
Industry F.E.	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes
R-squared	2 204	2 204	2 204	2 204
Adjusted R-squared	0.213	0.212	0.213	0.214
N	0.202	0.201	0.202	0.203

*Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001*

Table 13: Results from regressing ESG- data from S&P Global on FP

6.2.2 Firm Size and Risk on ROA

For all the 12 regression models, the control variable, firm size, indicates a negative and significant influence on financial performance. These findings contradict the expectations for the control variable, as discussed in section 5.2.3 Control Variables, because firm size is expected to positively affect financial performance due to advantages such as economies of scale (Robers & Dowling, 2022). The results from Model I-XII reveal that a one-unit increase in firm size will decrease the average ROA by between 1.17 and 1.74 percentage points. Even though these findings contradict the expected result, some studies find evidence of a negative relationship between firm size and ROA (Waddock & Graves, 1997; Hussain et al., 2018). Among these, Kartikasari & Merianti (2016) finds support for a negative link between total assets and ROA. The researchers argue that the results obtained are logically acceptable as total assets appear in ROA's denominator. In other words, when total assets increase, ROA decreases, assuming all other elements are constant. On the contrary, other studies argue that the more assets a company has, the higher the income and thus the generation of profits (Doğan, 2013). Following the latter argument, the more assets a company hold, the higher ROA.

In addition to investigating existing literature to evaluate the observed negative association between firm size and financial performance, it is highly relevant to address potential weaknesses with the model. As discussed in 4.4 Validity, several challenges can threaten the validity of the regression model. For instance, the presence of multicollinearity, omitted variables, or reverse causality can cause the model to predict significant but counterintuitive results. The mentioned biases could cause the coefficient sign of firm size to be wrong. Because of the results obtained from the collinearity test, there are reasons to assume that omitted variables or reverse causality may explain the observed effect of firm size. As mentioned in section 4.4.4 Reverse Causality, a potential issue of simultaneous causality is highly present in the dataset. Existing literature finds a bidirectional relationship between CSR and CFP (e.g., Qui et al., 2016; Busch & Friede, 2018; Alshenni et al., 2018). In an attempt to take this into account, the model in this research uses one time lag between the dependent and explanatory variables. However, literature still finds evidence of a statistically significant relationship between the variables even though time lag is used to prevent causality (e.g., Waddock & Graves, 1997). Therefore, another explanation for the unexpected firm size effect could be bias in the model.

Considering the two risk measurement variables, namely the leverage ratio and beta-coefficient, both variables were expected to have a negative effect on CFP. However, as illustrated in Table 11-Table 13, the beta coefficient has a decreasing and increasing effect on ROA. Nevertheless, the coefficient is not statistically significant in any of the models. As such, it provides no explanatory value to the regression analysis. On the contrary, the relationship between the leverage ratio and ROA is negative and significant. An additional unit of leverage reduces the average ROA by 0.97 – 1.06 percentage points for all models. In other words, the results obtained from the regression analyses indicate that firms with a higher level of debt also experience worse financial performance. These results are in accordance with existing literature, which finds that high levels of external debt in the capital structure are associated with lower ROA (e.g., Doğan, 2013; Akben-Selcuk, 2016; Xie et al., 2019).

6.3 Regression Findings

This thesis aims to answer whether and how ESG-scores from different rating-agencies influence companies' financial performance. The problem definition was divided into three segments to answer this research question, all of which are necessary to answer the main

question. Firstly, ESG-data provided by Refinitiv Eikon, Bloomberg, and S&P Global proved to be moderately correlated. For that reason, there is no support for the first segment, and Hypothesis 1, stating that there is no correlation between ESG-data from divergent rating agencies, cannot be confirmed. Secondly, the regression analysis shows that the relationship between the total ESG-score, environmental-, social-, and governance pillars, and CFP is positive and significant. According to these findings and in line with stakeholder theory, there is support for the second segment. As a result, Hypothesis 2 can be confirmed.

The last segment addresses to what extent ESG performance influences financial performance across rating agencies. Table 14 presents an overview of the regression results obtained from analyzing ESG performance on CFP. As the table shows, the largest source of disagreement is between Bloomberg and S&P Global about the governance pillar. Apart from that, the disagreement among the ESG-rating providers is low. Besides, there are no patterns in the findings, inferring that no solid conclusion can be drawn. Moreover, the results reveal that the effect of ESG performance differs slightly depending on the type of ESG-score provider. However, no provider differentiates themselves from the others. Therefore, the third segment and Hypothesis 3 cannot be confirmed since the results obtained from the analysis do not differ significantly between the providers.

	Refinitiv Eikon	**Bloomberg**	**S&P Global**
Dependent variable			
Return on Assets (t+1)			
Independent variables			
ESC Score	0.045***	0.046***	0.034***
Environmental	0.024***	0.024***	0.033***
Social	0.035***	0.025***	0.035***
Governance	0.015*	0.011***	0.032***

*$p<0.05$, **$p<0.01$, ***$p<0.001$

Table 14: Summary results from regressing ESG performance on FP

The findings obtained in this research are surprising. As illustrated in Table 8, the correlation between the ESG-measurements in this dataset ranges from 0.24 to 0.69, which indicates that the three rating agencies disagree. These results are in accordance with recent findings that have found evidence of a minimal correlation between ESG ratings from divergent providers (e.g., Dimson et al., 2020; Berg et al., 2022). However, the regression analysis does not reveal any evidence that choosing one provider over another will affect the results and conclusion of the ESG-rating's effect on CFP substantially. These findings are therefore unexpected as a large divergence between ESG-ratings from different rating agencies is expected to impact the results of empirical research.

A plausible explanation for the unpredictable results could be that ESG performance is not quantifiable. Therefore, it is impossible to identify corporate responsibility's influence on financial performance. ESG is not necessarily quantifiable due to the lack of a common framework to evaluate corporate sustainability. Not only do ESG-rating agencies assess companies differently, but firms and investors also use their own assessment when integrating ESG information (Amel-Zadeh & Serafeim, 2018). Even though the results obtained in this study show a weak and positive effect of ESG-rating on financial performance, critiques can be raised about whether this association is truly present due to measurement error in the ESG-scores.

Another explanation could be that corporate sustainability is not reflected in a company's ROA. ROA is an account-based measure and measures how well a company operates its assets to generate profit. One reason for the unpredicted effect of divergent ESG-ratings effects on ROA could be that ESG-rating is not reflected in a company's financial statement at all. Instead, ESG performance might be reflected in firms' and investors' expectations of the company, thus a company's stock price. Lastly, retaining the idea that ESG is not quantifiable could explain why ESG is not reflected as expected in ROA.

6.4 Limitations and Suggestions for Further Research

The data sample used in this research consists of companies listed on the STOXX Europe 600 index, limiting the study to a small portion of European listed companies. Besides, the lack of available ESG-data restricts the number of companies included in the study. As such, a limitation in this research is the number of observations used. In addition to the small sample size, 68% of the data sample comprises five European nations. As a result, the conclusions drawn in this study are not representable for the entire European market nor generalizable to other geographical regions. Omitted variables are an additional limitation of this research. An example of an omitted variable could be R&D expenditures. However, the lack of available data resulted in excluding the variable because it would have reduced the scope of this thesis significantly. Moreover, the risk of omitted variables is highly present in the data sample, thus a considerable limitation.

Following the limitations of this study, suggestions for future research are to extend the analysis concerning the number of observations included, control variables used, and expand the number

of ESG-rating providers addressed in the study. Another desirable suggestion for future research is to specialize in certain nations or industries to investigate the potential geographical and industrial differences. These differences are interesting as the number of obligatory and voluntarily reporting requirements differs between countries and industries. Therefore, the different reporting standards could impact the quality of the ESG-scores provided, thus the potential divergence between the rating agencies. Lastly, future research should account for the implications of the large ESG-rating disagreement among rating agencies. Such a supplement could include an analysis of how ESG-scores from different providers impact an investment strategy using ESG-ratings as the criteria. Another possibility is to replicate this study and apply it to other markets, obtaining comparable and more generalizable results.

7.0 Conclusion

The emergence of ESG-rating agencies has increased in past decades, causing corporate sustainability to become mainstream. As stakeholders' interest in firms' CSR engagements increases, the number of companies implementing ESG aspects as part of their business strategy elevates. As such, literature investigating whether a company's ESG engagements influence its financial performance is emerging. However, there are considerable disagreements among the rating agencies concerning a company's ESG-score. As a result, questions are raised about whether choosing one ESG-rating provider over another could impact the results and conclusions drawn in studies. Adding to the literature gap, this thesis provides evidence of the financial effect caused by divergent ESG-ratings. This paper finds evidence for a low correlation between ESG-ratings from three rating agencies: Refinitiv Eikon, Bloomberg, and S&P Global. Additionally, the paper finds support for a positive and significant relationship between ESG-ratings and financial performance measured by ROA. These findings hold regardless of Refinitiv Eikon, Bloomberg, or S&P Global being the ESG-rating provider. However, the strength of the relationship between ESG-score and financial performance varies slightly between the providers. Nevertheless, this divergence is not adequate to make any inferences about whether or not the chosen ESG-rating could impact the results of empirical research.

Although this thesis examines how the ESG-rating divergence unfolds in the relationship between ESG-score and financial performance, there is still much to learn about the effect of ESG-rating disagreement. Due to the continuing literature gap, future research is recommended to extend the analysis even further. The target of future research could be to explore the consequences caused by the lack of a common framework for corporate sustainability assessments.

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Appendices

Appendix 1: List of companies

This table provides an overview of all companies listed on the STOXX Europe 600 index.

Company name					
3I GROUP	ARKEMA	BNP PARIBAS	DAVIDE CAMPARI MILANO	ESSITY B	HARGREAVES LANSDOWN
A P MOLLER MAERSK B	AROUNDTOWN	BOLIDEN ORD SHS	DCC	COLRUYT	HAYS
A2A	ASHTEAD GROUP	BOLLORE	DECHRA PHARMACEUTICALS	EURAZEO	HEIDELBERGCEMENT (XET)
AAK	ASM INTERNATIONAL	BOUYGUES	DELIVERY HERO (XET)	EUROFINS SCIEN.	HEINEKEN
AALBERTS	ASML HOLDING	BP	DEMANT	EURONEXT	HEINEKEN HOLDING
ABB LTD N	ASR NEDERLAND	BRENNTAG (XET)	DERWENT LONDON	EVOLUTION	HELLOFRESH (XET)
ABN AMRO BANK	ASSA ABLOY B	BRIDGEPOINT GROUP	DEUTSCHE BANK (XET)	EVONIK INDUSTRIES (XET)	HELVETIA HOLDING N
ABRDN	ASSICURAZIONI GENERALI	BRITISH AMERICAN TOBACCO	DEUTSCHE BOERSE (XET)	EVOTEC (XET)	HENKEL PREF. (XET)
ACCIONA	ASSOCIATED BRIT.FOODS	BRITISH LAND	DEUTSCHE POST (XET)	EXOR ORD	HENNES & MAURITZ B
ACCOR	ASTRAZENECA	BRITVIC	DEUTSCHE TELEKOM (XET)	EXPERIAN	HERA
ACKERMANS & VAN HAAREN	ATLANTIA	BT GROUP	DIAGEO	FABEGE	HERMES INTL.
ACS ACTIV.CONSTR.Y SERV.	ATLAS COPCO A	BUCHER INDUSTRIES	DIASORIN	FASTIGHETS BALDER B	HEXAGON B
ADDLIFE B	ATOS	BUNZL	D IETEREN GROUP	FAURECIA	HEXPOL B
ADDTECH B	AURUBIS (XET)	BURBERRY GROUP	DINO POLSKA SA	FERGUSON	HIKMA PHARMACEUTICALS
ADECCO GROUP	AUTO TRADER GROUP	BUREAU VERITAS	DIPLOMA	FERRARI (MIL)	HISCOX DI
ADEVINTA	AUTOSTORE HOLDINGS	CAIXABANK	DIRECT LINE IN.GROUP	FERROVIAL	HOLCIM
ADIDAS (XET)	AVANZA BANK HOLDING	CAPGEMINI	DKSH HOLDING	FINECOBANK SPA	HOLMEN B
ADMIRAL GROUP	AVAST	CARL ZEISS MEDITEC (XET)	DNB BANK	FLUGHAFEN ZURICH	HOMESERVE
ADP	AVEVA GROUP	CARLSBERG B	DOMETIC GROUP	FLUIDRA	HOWDEN JOINERY GP.
ADYEN	AVIVA	CARREFOUR	DR MARTENS	FLUTTER ENTERTAINMENT	HSBC HOLDINGS
AEDIFICA	AXA	CASTELLUM	DRAX GROUP	FORTUM	BOSS (HUGO) (XET)
AEGON	B&M EUROPEAN VAL.RET.	CD PROJEKT	SMITH (DS)	FREENET (XET)	HUHTAMAKI
AENA SME	BACHEM HOLDING	CELLNEX TELECOM	DSV	FRESENIUS (XET)	HUSQVARNA B
AGEAS (EX-FORTIS)	BAE SYSTEMS	CENTRICA	DUFRY 'R'	FRESENIUS MED.CARE	INTL.CONS.AIRL.GP.
KONINKLIJKE AHOLD DELHAIZE	BAKKAFROST	CHRISTIAN HANSEN HOLDING	E ON N (XET)	FUCHS PETROLUB PREF.	IBERDROLA
AIR LIQUIDE	BALOISE HOLDING	CHRISTIAN DIOR	EASYJET	FUTURE	IG GROUP HOLDINGS
AIRBUS	BANCO BPM	RICHEMONT N	EDENRED	GALENICA SANTE	IMCD GROUP
AKER BP	BANK OF IRELAND GROUP	CLARIANT	EDF	GALP ENERGIA SGPS	IMI
AKZO NOBEL	BANKINTER 'R'	CLOSE BROTHERS GROUP	EDP ENERGIAS DE PORTUGAL	GAMES WORKSHOP	IMPERIAL BRANDS
ALCON (SWX) ORD SHS	BARCLAYS	CNH INDUSTRIAL	EDP RENOVAVEIS	GEA GROUP (XET)	INCHCAPE
ALFA LAVAL	BARRATT DEVELOPMENTS	CNP ASSURANCES	EIFFAGE	GEBERIT 'R'	INDITEX
ALK-ABELLO B	BARRY CALLEBAUT	COCA-COLA HBC	ELECTROCOMP.	GECINA	INDUSTRIVARDEN A
ALLEGRO	BASF (XET)	COFINIMMO	ELECTROLUX B	GENMAB	INDUTRADE
ALLFUNDS GROUP	BAWAG GROUP	COLOPLAST B	ELEKTA B	GENUS	INFINEON TECHS. (XET)
ALLIANZ	BAYER (XET)	COMMERZBANK (XET)	ELIA GROUP	GEORG FISCHER	INFORMA
ALLREAL HOLDING	BBV.ARGENTARIA	COMPASS GROUP	ELIS	GETINGE B	ING GROEP
ALSTOM	BANCO DE SABADELL	CONTINENTAL (XET)	ELISA	GETLINK	INMOBILIARIA COLONIAL
ALTEN	BANCO SANTANDER	CONVATEC GROUP	EMS-CHEMIE 'N'	GIVAUDAN 'N'	ICTL.HTLS.GP.
AMADEUS IT GROUP	BE SEMICON INDUSTRIES	COVESTRO (XET)	ENAGAS	GJENSIDIGE FORSIKRING	INTERMEDIATE CAPITAL GP.
AMBU B	BEAZLEY	COVIVIO	ENDESA	GLANBIA	INTERPUMP GROUP
AMPLIFON	BECHTLE (XET)	CREDIT AGRICOLE	ENEL	GLAXOSMITHKLINE	INTERROLL
AMS-OSRAM AG	BEIERSDORF (XET)	CREDIT SUISSE GROUP	ENGIE	GLENCORE	INTERTEK GROUP
AMUNDI (WI)	BEIJER REF B	CRH	ENI	GN STORE NORD	INTESA SANPAOLO
ANDRITZ	BELIMO N	CRODA INTERNATIONAL	ENTAIN	GRAFTON GROUP UTS.	INVESTEC
ANGLO AMERICAN	BELLWAY	CTS EVENTIM	EPIROC A	GREGGS	INVESTOR B
ANHEUSER-BUSCH INBEV	BERKELEY GROUP HOLDINGS	DAIMLER TRUCK HOLDING	EQT	GRIFOLS ORD CL A	Azioni INWIT
ANTOFAGASTA	BIG YELLOW GROUP	DANONE	EQUINOR	GBL NEW	IPSEN
ARCADIS	BILLERUDKORSNAS	DANSKE BANK	ERICSSON B	SOCIETE GENERALE	ISS
ARCELORMITTAL	BIOMERIEUX	DASSAULT AVIATION	ERSTE GROUP BANK	HALMA	ITALGAS
ARGENX	BMW (XET)	DASSAULT SYSTEMES	ESSILORLUXOTTICA	HANNOVER RUECK (XET)	ITV

Appendix 1: List of companies cont.

This table provides an overview of all companies listed on the STOXX Europe 600 index.

Company name					
IWG	MARKS & SPENCER GROUP	PERNOD-RICARD	SAGAX B	SOPRA STERIA GROUP	UBS GROUP
JD SPORTS FASHION	MEDIOBANCA BC.FIN	PERSIMMON	SAGE GROUP	SPECTRIS	UCB
JDE PEET S	MEGGITT	PHILIPS ELTN.KONINKLIJKE	SAINSBURY J	SPIE	ULTRA ELECTRONICS
JERONIMO MARTINS	MELROSE INDUSTRIES	PHOENIX GROUP HDG.	SAINT GOBAIN	SPIRAX-SARCO ENGR.	UNIVERSAL MUSIC GROUP
JOHNSON MATTHEY	MERCEDES-BENZ GROUP	PLKNC.NAFTOWY ORLEN	SALMAR	SSAB B	UMICORE
JULIUS BAER GRUPPE	MERCK KGAA (XET)	PKO BANK	SAMHALLSBYGGNADSBOLAGET	ST.JAMES'S PLACE ORD	UNIBAIL RODAMCO WE STAPLED UNITS
JUST EAT TAKEAWAY.COM	MERLIN PROPERTIES REIT	PORSCHE AML.HLDG. PREF.	SAMPO 'A'	STANDARD CHARTERED	UNICREDIT
K + S (XET)	METSO OUTOTEC	POSTE ITALIANE	SANDVIK	STELLANTIS	UNILEVER (UK)
KBC GROUP	CMPG.DES ETS.MICH.	PRIMARY HEALTH PROPS.	SANOFI	STMICROELECTRONICS (MIL)	UNIPER SE (XET)
KERING	MILLICOM INTL CELU	PROSIEBENSAT 1 MEDIA	SAP (XET)	STORA ENSO R	UNITE GROUP
KERRY GROUP 'A'	MIPS	PROSUS	SARTORIUS PREF.	STOREBRAND	UNITED INTERNET (XET)
KESKO B	MONCLER	PROXIMUS	SARTORIUS STEDIM BIOTECH	STORSKOGEN GROUP B	UNITED UTILITIES GROUP
KGHM	MONDI	PRUDENTIAL	SCHIBSTED A	STRAUMANN HLDG.	UPM-KYMMENE
KINDRED GROUP SDR	MOWI	PRYSMIAN	SCHINDLER 'P'	SVENSKA CELLULOSA AKTIEBOLAGET	VALEO
KINGFISHER	MTU AERO ENGINES HLDG.	PSP SWISS PROPERTY AG	SCHNEIDER ELECTRIC	SVENSKA HANDELSBANKEN A	VALMET
KINGSPAN GROUP	MUENCHENER RUCK.	PUBLICIS GROUPE	SCHRODERS	THE SWATCH GROUP	VANTAGE TOWERS N (XET)
KINNEVIK B	NATIONAL GRID	PUMA (XET)	SCOR SE	SWECO B	VAT GROUP
KION GROUP (XET)	NATURGY ENERGY	PZU GROUP	SSE	SWEDBANK A	VEOLIA ENVIRON
KLEPIERRE REIT	NATWEST GROUP	QIAGEN (XET)	SCOUT24 (XET)	SWEDISH MATCH	VERBUND
KNORR BREMSE (XET)	NEMETSCHEK (XET)	QT GROUP	SEB	SWEDISH ORPHAN BIOVITRUM	VESTAS WINDSYSTEMS
KOJAMO	NESTE	QUILTER	SECTRA B	SWISS LIFE HOLDING	VICTREX
KONE 'B'	NESTLE 'N'	RAIFFEISEN BANK INTL.	SECURITAS B	SWISS PRIME SITE	VIFOR PHARMA
KONGSBERG GRUPPEN	NETCOMPANY GROUP	RANDSTAD	SEGRO	SWISS RE	VINCI
DSM KONINKLIJKE	NEXI	RATIONAL (XET)	SES FDR	SWISSCOM 'R'	VIRGIN MONEY UK
KPN KON	NEXT	RECKITT BENCKISER GROUP	SEVERN TRENT	SYMRISE (XET)	VISTRY GROUP
KUEHNE UND NAGEL INT	NIBE INDUSTRIER	RECORDATI INDUA.CHIMICA	SGS 'N'	TAG IMMOBILIEN (XET)	VITROLIFE
LA FRANCAISE DES JEUX	NN GROUP	RED ELECTRICA	SHELL	TATE & LYLE	VIVENDI
LAND SECURITIES GROUP	NOKIA	RELX	SIEGFRIED 'R'	TAYLOR WIMPEY	VODAFONE GROUP
LANXESS (XET)	NOKIAN RENKAAT	REMY COINTREAU	SIEMENS (XET)	TECAN 'R'	VOESTALPINE
LATOUR INVESTMENT B	NORDEA BANK (HEL)	RENAULT	SIEMENS ENERGY	TELE2 B	VOLKSWAGEN PREF. (XET)
LEG IMMOBILIEN (XET)	NORDIC ENTERTAINMENT GROUP	RENTOKIL INITIAL	SIEMENS GAMESA RENEWABLE	TELECOM ITALIA	VOLVO B
LEGAL & GENERAL	NORDIC SEMICONDUCTOR	REPLY	SIEMENS HEALTHINEERS	TELEFONICA	VOLVO CAR B
LEGRAND	NORSK HYDRO	REPSOL YPF	SIG GROUP N	TELENOR	VONOVIA (XET)
LEONARDO	NOVARTIS 'R'	REXEL	SIGNIFY	TELEPERFORMANCE	WALLENSTAM 'B'
LIFCO B	NOVO NORDISK 'B'	RHEINMETALL (XET)	SIKA	TELIA COMPANY	WARTSILA
LINDE (XET)	NOVOZYMES B	RIGHTMOVE	SIMCORP	TEMENOS N	WATCHES OF SWITZERLAND GROUP
CHOCOLADEFABRIKEN L & S	OCADO GROUP	RINGKJOBING LANDBOBANK	SINCH	TENARIS	WAREHOUSES DE PAUW
LLOYDS BANKING GROUP	OMV	RIO TINTO	SKANDINAVISKA ENSKILDA BANKEN	TERNA RETE ELETTRICA NAZ	WEIR GROUP
LOGITECH 'R'	ORANGE	ROCHE HOLDING	SKANSKA B	TESCO	WENDEL
LONDON STOCK EXCHANGE GROUP	ORION B	ROCKWOOL B	SKF B	THALES	WHITBREAD
LONDONMETRIC PROPERTY	ORKLA	ROLLS-ROYCE HOLDINGS	SMITH & NEPHEW	THULE GROUP	WIENERBERGER
LONZA GROUP	ORPEA	ROTORK	SMITHS GROUP	THYSSENKRUPP (XET)	WIHLBORGS FASTIGHETER
L'OREAL	ORSTED	ROYAL MAIL	SMURFIT KAPPA GROUP	TOMRA SYSTEMS	WISE A
LPP	OSB GROUP	ROYAL UNIBREW	SNAM	TOTALENERGIES	WIZZ AIR HOLDINGS
DEUTSCHE LUFTHANSA (XET)	OXFORD NANOPORE TECH.	RUBIS	SODEXO	TRAVIS PERKINS	WOLTERS KLUWER
LUNDBERGFORETAGEN B	PANDORA	RWE (XET)	SOFINA	TRELLEBORG B	WORLDLINE
LUNDIN ENERGY	PARTNERS GROUP HOLDING	RYANAIR HOLDINGS	SOFTCAT	TRITAX BIG BOX REIT	WPP
LVMH	PEARSON	S4 CAP.ORD.SHS.	SOITEC	TRYG	YARA INTERNATIONAL
M&G	BANK POLSKA KASA OPIEKI	SAFESTORE HOLDINGS	SOLVAY	TUI (LON)	ZALANDO (XET)
MAN GROUP	PENNON GROUP	SAFRAN	SONOVA N	UBISOFT ENTERTAINMENT CAT	ZURICH INSURANCE GROUP

Appendix 2: Summary of ESG-rating providers

This table provides an overview of the key aspects concerning all three ESG-rating providers used in this research. The table includes short information about the ESG-scores, sources used to obtain the ESG-ratings, different scores, score range, and weighting methodology.

	Refinitiv Eikon
ESG score	Measures the company's ESG performance based on verifiable reported data in the public domain
ESG score decomposition	*Environmental*: Resource Use, Emissions, Innovation *Social*: Workforce, Human Rights, Community, Product Responsibility *Governance*: Management, Shareholders, CSR Strategy
Sources	Annual Reports, Company Websites, NGO Websites, Stock Exchange Fillings, CSR Reports, News Sources
Scores	ESG, ENV, SOC & GOV
Score-range	0-100
Weightning	Weightning depends on industry and will therefore vary

Source: Refinitiv (2022)

	Bloomberg
ESG score	Measures the company's ESG disclosure based on public company reports
ESG score decomposition	*Environmental:* Carbon Emission, Pollution, Materials & Waste, Renewable Energy, Resource Depletion, Air Quality, Climate Change *Social*: Supply Chain, Discrimination, Political Contributions, Diversity, Human Rights, Community Relations, Health & Safety *Governance*: Culumative Voting, Executive Compensation, Shareholders' rights, Takeover Defense, Staggered Boards, Independent Directors
Sources	Annual Reports, Sustainability Reports, Press Relieases, Third-party Research
Scores	ESG, ENV, SOC & GOV
Score-range	0-100
Weightning	Weightning depends on industry and will therefore vary

Source: Bloomberg (2014), Bloomberg (2022)

	S&P Global (RobecoSAM)
ESG score	Measures the company's sustainability rank based on company disclosure, media and stakeholder analysis
ESG score decomposition	*Environmental:* Environmental Reporting, Environmental Policy & Management, Operational Eco-Efficiency, Biodiversity, Climate Strategy *Social*: Social Reporting, Corporate Citizenship, Human Capital, Talent Attraction & Retention, Human Rights, Stakeholder Engagement, Health & Safety *Governance & Economic*: Corporate Governance, Codes of Business Ethics, Risk & Crisis Management
Sources	Annual Reports, Company Websites, Product Descriptions, Media, Stakeholder Sources, S&P Global data
Scores	ESG, ENV, SOC & GOV
Score-range	0-100
Weightning	Weightning depends on industry and will therefore vary

Source: S&P Global (2022), Sustainable1 (2022)

Appendix 3: Model building test results

This table provides a short description of the test results used in the model building. The table includes the results from the Poolability test, Breusch-Pagan LM test, and Hausman test.

Model building

Test	**Hypothesis**	**Prob>F**		**Preffered model**
Poolability test	H0: no individual effects H1: there exsist individual effects	0.000	Reject H0	Fixed-effects model
Test	**Hypothesis**	**Prob>Chi**		**Preffered model**
Breusch-Pagan test	H0: no individual effects H1: there exsist individual effects	0.000	Reject H0	Random-effects model
Test	**Hypothesis**	**Prob>F**		**Preffered model**
Hausman test	H0: random-effects model appropriate H1: fixed-effects model appropriate	0.000	Reject H0	Fixed-effects model

Appendix 4: Collinearity statistics

This table provides a detailed overview of the collinearity statistics from the calculation of the variance inflation factor (VIF) and tolerance level (1/VIF) for all explanatory variables.

	Refinitiv Eikon				Bloomberg				S&P Global			
Model	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VII**	**VIII**	**IX**	**X**	**XI**
Independent variables												
ESC Score	1.65 *(0.61)*				1.75 *(0.57)*				1.46 *(0.68)*			
Environmental		1.69 *(0.59)*				1.59 *(0.63)*				1.47 *(0.68)*		
Social			1.56 *(0.64)*				*1.40 (0.71)*				*1.41 (0.71)*	
Governance				1.19 *(0.84)*				1.21 *(0.82)*				1.38 *(0.72)*
Control variables												
Firm size	2.93 *(0.34)*	2.93 *(0.34)*	2.78 *(0.36)*	2.33 *(0.42)*	2.71 *(0.37)*	2.57 *(0.38)*	2.40 *(0.41)*	2.18 *(0.45)*	2.51 *(0.39)*	*2.52 (0.39)*	2.46 *(0.40)*	2.44 *(0.40)*
Leverage	1.25 *(0.80)*	1.24 *(0.80)*	1.25 *(0.80)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.25 *(0.79)*	1.22 *(0.81)*	1.22 *(0.81)*	1.22 *(0.81)*	1.22 *(0.81)*
Risk	1.21 (0.83)	1.22 *(0.82)*	1.21 *(0.82)*	1.21 *(0.82)*	1.22 *(0.82)*	1.22 *(0.81)*	1.23 *(0.81)*	1.22 *(0.81)*	1.24 *(0.80)*	1.24 *(0.80)*	1.24 *(0.80)*	1.24 *(0.80)*
Industry variables												
Telecommunications	1.18 *(0.85)*	1.77 *(0.57)*	1.77 *(0.56)*	1.77 *(0.56)*	2.03 *(0.49)*	2.02 *(0.49)*	2.02 *(0.49)*	2.02 *(0.49)*	2.09 *(0.47)*	2.09 *(0.47)*	2.10 *(0.47)*	2.08 *(0.48)*
Health care	3.18 *(0.31)*	3.12 *(0.32)*	3.12 *(0.32)*	3.12 *(0.32)*	3.04 *(0.32)*	3.05 *(0.32)*	3.04 *(0.32)*	3.04 *(0.32)*	2.88 *(0.34)*	2.88 *(0.34)*	2.88 *(0.34)*	2.88 *(0.34)*
Financials	6.05 *(0.17)*	5.75 *(0.17)*	6.00 *(0.16)*	5.68 *(0.17)*	5.31 *(0.18)*	5.23 *(0.19)*	5.24 *(0.19)*	5.11 *(0.19)*	5.49 *(0.18)*	5.55 *(0.18)*	5.50 *(0.18)*	5.43 *(0.18)*
Real Estate	2.39 *(0.42)*	2.36 *(0.42)*	2.35 *(0.42)*	2.34 *(0.42)*	2.30 *(0.43)*	2.30 *(0.43)*	2.31 *(0.43)*	2.30 *(0.43)*	1.97 *(0.50)*	1.97 *(0.50)*	1.97 *(0.50)*	1.96 *(0.50)*
Cusomer Discretionary	4.23 *(0.23)*	4.15 *(0.24)*	4.14 *(0.24)*	4.14 *(0.24)*	3.76 *(0.26)*	3.75 *(0.26)*	3.74 *(0.26)*	3.74 *(0.26)*	3.76 *(0.26)*	3.76 *(0.26)*	3.76 *(0.26)*	3.76 *(0.26)*
Customer Staples	2.99 *(0.33)*	2.96 *(0.34)*	2.94 *(0.34)*	2.94 *(0.34)*	2.74 *(0.36)*	2.74 *(0.36)*	2.71 *(0.36)*	2.72 *(0.36)*	2.72 *(0.36)*	2.73 *(0.36)*	2.73 *(0.36)*	2.72 *(0.36)*
Industrials	5.37 *(0.19)*	5.27 *(0.19)*	5.27 *(0.18)*	5.26 *(0.19)*	4.72 *(0.21)*	4.72 *(0.21)*	4.70 *(0.21)*	4.70 *(0.21)*	4.71 *(0.21)*	4.73 *(0.21)*	4.73 *(0.21)*	4.70 *(0.21)*
Basic Materials	2.93 *(0.34)*	2.90 *(0.34)*	2.86 *(0.34)*	2.86 *(0.34)*	2.64 *(0.37)*	2.64 *(0.37)*	2.57 *(0.38)*	2.55 *(0.39)*	2.64 *(0.37)*	2.64 *(0.37)*	2.64 *(0.37)*	2.64 *(0.37)*
Energy	2.09 *(0.48)*	2.06 *(0.48)*	2.06 *(0.48)*	2.06 *(0.48)*	1.98 *(0.50)*	1.98 *(0.50)*	1.97 *(0.50)*	1.97 *(0.50)*	2.01 *(0.49)*	2.01 *(0.49)*	2.01 *(0.49)*	2.01 *(0.49)*
Utilities	2.61 *(0.38)*	2.56 *(0.39)*	2.57 *(0.38)*	2.56 *(0.39)*	2.36 *(0.42)*	2.37 *(0.42)*	2.35 *(0.42)*	2.34 *(0.42)*	2.41 *(0.41)*	2.41 *(0.41)*	2.41 *(0.41)*	2.40 *(0.41)*
Country variables												
Belgium	1.31 *(0.76)*	1.30 *(0.77)*	1.31 *(0.76)*	1.30 *(0.76)*	1.30 *(0.76)*	1.31 *(0.76)*	1.30 *(0.70)*	1.31 *(0.76)*	1.27 *(0.78)*	1.27 *(0.78)*	1.27 *(0.78)*	1.27 *(0.78)*
Denmark	1.41 *(0.71)*	1.39 *(0.72)*	1.39 *(0.71)*	1.39 *(0.71)*	1.38 *(0.72)*	1.39 *(0.71)*	1.39 *(0.71)*	1.39 *(0.72)*	1.37 *(0.73)*	1.38 *(0.72)*	1.36 *(0.73)*	1.36 *(0.73)*
Spain	1.49 *(0.67)*	1.49 *(0.67)*	1.49 *(0.67)*	1.47 *(0.67)*	1.53 *(0.65)*	1.48 *(0.67)*	1.50 *(0.66)*	1.49 *(0.67)*	1.55 *(0.64)*	1.54 *(0.64)*	1.54 *(0.65)*	1.54 *(0.64)*
Finland	1.34 *(0.75)*	1.33 *(0.75)*	1.31 *(0.76)*	1.31 *(0.76)*	1.40 *(0.71)*	1.33 *(0.75)*	1.32 *(0.75)*	1.34 *(0.74)*	1.40 *(0.71)*	1.39 *(0.71)*	1.39 *(0.72)*	1.40 *(0.71)*
France	2.05 *(0.49)*	2.04 *(0.49)*	2.03 *(0.49)*	2.04 *(0.48)*	2.09 *(0.47)*	1.98 *(0.50)*	1.98 *(0.50)*	2.15 *(0.46)*	2.02 *(0.49)*	2.02 *(0.49)*	2.02 *(0.49)*	2.01 *(0.49)*
Ireland	1.23 *(0.81)*	1.22 *(0.82)*	1.23 *(0.81)*	1.22 *(0.82)*	1.12 *(0.89)*	1.13 *(0.88)*	1.12 *(0.89)*	1.13 *(0.88)*	1.12 *(0.89)*	1.12 *(0.89)*	1.13 *(0.88)*	1.11 *(0.89)*
Italy	1.39 *(0.72)*	1.39 *(0.72)*	1.39 *(0.72)*	1.38 *(0.72)*	1.44 *(0.69)*	1.41 *(0.70)*	1.42 *(0.70)*	1.42 *(0.70)*	1.43 *(0.70)*	1.42 *(0.70)*	1.42 *(0.70)*	1.43 *(0.70)*
Luxembourg	1.09 *(0.91)*	1.14 *(0.88)*	1.14 *(0.88)*	1.14 *(0.87)*	1.15 *(0.86)*	1.16 *(0.86)*	1.15 *(0.86)*	1.15 *(0.86)*	1.16 *(0.85)*	1.16 *(0.85)*	1.16 *(0.85)*	1.16 *(0.85)*
Netherlands	1.44 *(0.69)*	1.44 *(0.70)*	1.44 *(0.69)*	1.44 *(0.69)*	1.43 *(0.69)*	1.41 *(0.70)*	1.42 *(0.70)*	1.44 *(0.69)*	1.50 *(0.66)*	1.49 *(0.67)*	1.50 *(0.66)*	1.50 *(0.66)*
Norway	1.29 *(0.78)*	1.29 *(0.78)*	1.28 *(0.77)*	1.28 *(0.78)*	1.32 *(0.75)*	1.32 *(0.75)*	1.32 *(0.75)*	1.32 *(0.75)*	1.36 *(0.73)*	1.36 *(0.73)*	1.36 *(0.73)*	1.36 *(0.73)*
Austria	1.18 *(0.84)*	1.18 *(0.85)*	1.18 *(0.84)*	1.18 *(0.84)*	1.18 *(0.85)*	1.17 *(0.85)*	1.17 *(0.85)*	1.18 *(0.84)*	1.18 *(0.84)*	1.18 *(0.84)*	1.18 *(0.84)*	1.18 *(0.84)*
Poland	1.16 *(0.86)*	1.15 *(0.87)*	1.15 *(0.86)*	1.14 *(0.87)*	1.15 *(0.86)*	1.15 *(0.87)*	1.14 *(0.87)*	1.14 *(0.87)*	1.15 *(0.86)*	1.15 *(0.86)*	1.14 *(0.87)*	1.15 *(0.86)*
Portugal	1.11 *(0.89)*	1.11 *(0.90)*	1.11 *(0.89)*	1.11 *(0.89)*	1.11 *(0.90)*	1.11 *(0.90)*	1.11 *(0.90)*	1.11 *(0.90)*	1.12 *(0.89)*	1.12 *(0.89)*	1.12 *(0.89)*	1.12 *(0.89)*
Sweden	1.84 *(0.54)*	1.81 *(0.55)*	1.78 *(0.56)*	1.78 *(0.56)*	1.76 *(0.56)*	1.80 *(0.55)*	1.80 *(0.55)*	1.77 *(0.56)*	1.78 *(0.56)*	1.79 *(0.55)*	1.79 *(0.56)*	1.77 *(0.56)*
Switzerland	1.78 *(0.56)*	1.76 *(0.57)*	1.76 *(0.56)*	1.76 *(0.56)*	1.75 *(0.57)*	1.73 *(0.57)*	1.72 *(0.57)*	1.74 *(0.57)*	1.71 *(0.58)*	1.72 *(0.58)*	1.71 *(0.58)*	1.71 *(0.58)*
United Kingdom	2.78 *(0.36)*	2.73 *(0.37)*	2.73 *(0.36)*	2.74 *(0.36)*	2.81 *(0.35)*	2.57 *(0.38)*	2.64 *(0.37)*	2.75 *(0.36)*	2.52 *(0.39)*	2.53 *(0.39)*	2.50 *(0.40)*	2.53 *(0.39)*
Mean	**2.13**	**2.13**	**2.12**	**2.08**	**2.06**	**2.03**	**2.01**	**2.01**	**2.03**	**2.03**	**2.02**	**2.02**

Tolerance level (1/VIF) in parentheses.

Appendix 5: Regression results – ESG data from Refinitiv Eikon on ROA

This table provides the detailed results obtained from regression models I-IV. The dependent variable is measured by *ROA* and is observed at time *t+1*. The independent variables are the *total ESG score, environmental pillar, social pillar,* and *governance pillar* provided by Refinitiv Eikon and are observed at time *t*. The control variables are *firm size* (natural logarithm of total assets), *leverage* (natural logarithm of total debt over total capital), and *risk* (historic beta) and are observed at time *t. Industry F.E.* is a dummy variable controlling for industry-specific variation. *Country F.E.* is a dummy variable controlling for country-specific variation.

	Refinitiv Eikon			
	Model I	Model II	Model III	Model IV
Variables				
Intercept	34.13 *(2.600)***	34.55 *(2.465)***	34.19 *(2.345)***	32.60 *(2.374)***
Independent variables				
ESC Score	0.045 *(0.009)***			
Environmental		0.024 *(0.006)***		
Social			0.035 *(0.006)***	
Governance				0.015 *(0.007)**
Control variables				
Firm size	-1.541 *(0.195)***	-1.472 *(0.172)***	-1.520 *(0.165)***	-1.323 *(0.174)***
Leverage	-1.048 *(0.126)***	-0.972 *(0.127)***	-0.989 *(0.126)***	-0.992 *(0.125)***
Risk	0.015 *(0.273)*	-0.062 *(0.275)*	0.008 *(0.273)*	0.002 *(0.275)*
Industry variables				
Telecommunications	-8.332 *(1.739)***	-1.931 *(1.033)*	-1.624 *(1.046)*	-1.952 *(1.030)*
Health care	-1.612 *(0.868)*	-1.644 *(0.849)*	-1.705 *(0.850)*	-1.615 *(0.849)*
Financials	-2.671 *(0.992)***	-3.239 *(0.924)***	-2.659 *(0.951)***	-3.501 *(0.925)***
Real Estate	-1.440 *(1.344)*	-1.912 *(1.310)*	-1.391 *(1.339)*	-1.616 *(1.339)*
Cusomer Discretionary	-1.669 *(0.837)*	-1.866 *(0.818)*	-1.696 *(0.821)*	-1.744 *(0.817)*
Customer Staples	-1.569 *(0.887)*	-1.829 *(0.871)*	-1.581 *(0.874)*	-1.562 *(0.872)*
Industrials	-3.112 *(0.800)***	-3.365 *(0.778)***	-3.111 *(0.783)***	-3.256 *(0.777)***
Basic Materials	-2.486 *(0.888)***	-2.639 *(0.873)***	-2.398 *(0.872)***	-2.387 *(0.868)***
Energy	-3.977 *(0.955)***	-4.118 *(0.940)***	-3.882 *(0.946)***	-4.135 *(0.934)***
Utilities	-3.248 *(0.873)***	-3.589 *(0.848)***	-3.203 *(0.858)***	-3.451 *(0.852)***
Country variables				
Belgium	-0.905 *(0.444)**	-1.226 *(0.443)***	-0.853 *(0.443)*	-1.173 *(0.424)***
Denmark	6.794 *(0.819)***	6.524 *(0.807)***	6.676 *(0.800)***	6.463 *(0.822)***
Spain	-0.189 *(0.418)*	-0.238 *(0.402)*	-0.315 *(0.400)*	0.076 *(0.393)*
Finland	1.709 *(0.567)***	1.074 *(0.561)*	1.354 *(0.558)**	1.509 *(0.547)***
France	-0.410 *(0.330)*	-0.695 *(0.322)**	-0.533 *(0.320)*	-0.396 *(0.319)*
Ireland	-0.032 *(0.501)*	-0.256 *(0.497)*	-0.039 *(0.501)*	-0.547 *(0.506)*
Italy	0.255 *(0.389)*	0.043 *(0.377)*	0.073 *(0.372)*	0.241 *(0.374)*
Luxembourg	-0.317 *(0.838)*	0.258 *(0.816)*	0.217 *(0.822)*	0.181 *(0.798)*
Netherlands	0.074 *(0.546)*	-0.036 *(0.527)*	-0.116 *(0.531)*	0.021 *(0.529)*
Norway	2.188 *(0.730)***	2.026 *(0.687)***	2.050 *(0.683)***	1.827 *(0.686)***
Austria	-1.024 *(0.430)**	-1.446 *(0.422)***	-1.065 *(0.419)**	-1.191 *(0.417)***
Poland	2.349 *(1.067)**	2.065 *(1.069)*	2.257 *(1.053)**	1.706 *(1.057)*
Portugal	-0.772 *(0.547)*	-0.974 *(0.552)*	-1.084 *(0.542)**	-0.408 *(0.516)*
Sweden	5.363 *(0.574)***	4.939 *(0.542)***	4.933 *(0.545)***	4.709 *(0.545)***
Switzerland	1.466 *(0.389)***	1.328 *(0.382)***	1.396 *(0.382)***	1.340 *(0.381)***
United Kingdom	0.941 *(0.365)**	0.918 *(0.358)**	0.959 *(0.359)***	0.931 *(0.359)***
R-squared	4 964	5 083	5 083	5 083
Adjusted R-squared	0.209	0.202	0.205	0.201
N	0.204	0.198	0.200	0.196

*Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001*

Appendix 6: Regression results – ESG data from Bloomberg on ROA

This table provides the detailed results obtained from regression models V-VIII. The dependent variable is measured by *ROA* and is observed at time *t+1*. The independent variables are the *total ESG score, environmental pillar, social pillar,* and *governance pillar* provided by Bloomberg and are observed at time *t*. The control variables are *firm size* (natural logarithm of total assets), *leverage* (natural logarithm of total debt over total capital), and *risk* (historic beta) and are observed at time *t. Industry F.E.* is a dummy variable controlling for industry-specific variation. *Country F.E.* is a dummy variable controlling for country-specific variation.

	Bloomberg			
	Model V	Model VI	Model VII	Model VIII
Variables				
Intercept	31.98 *(2.240)***	31.73 *(2.211)***	31.03 *(2.228)***	30.35 *(2.065)***
Independent variables				
ESC Score	0.046 *(0.010)***			
Environmental		0.024 *(0.005)***		
Social			0.025 *(0.009)***	
Governance				0.011 *(0.005)***
Control variables				
Firm size	-1.336 *(0.168)***	-1.256 *(0.155)***	-1.211 *(0.161)***	-1.169 *(0.147)***
Leverage	-1.036 *(0.122)***	-1.034 *(0.122)***	-1.039 *(0.122)***	-1.037 *(0.122)***
Risk	-0.224 *(0.280)*	-0.191 *(0.271)*	-0.244 *(0.280)*	-0.258 *(0.279)*
Industry variables				
Telecommunications	-2.149 *(0.887)**	-2.167 *(0.880)**	-2.087 *(0.886)**	-2.139 *(0.883)**
Health care	-1.903 *(0.776)**	-1.942 *(0.774)**	-1.772 *(0.772)**	-1.782 *(0.776)**
Financials	-2.873 *(0.908)***	-3.103 *(0.871)****	-3.161 *(0.887)****	-3.350 *(0.864)****
Real Estate	-1.356 *(1.221)*	-1.499 *(1.203)*	-1.343 *(1.228)*	-1.433 *(1.205)*
Cusomer Discretionary	-1.655 *(0.761)**	-1.757 *(0.755)**	-1.550 *(0.756)**	-1.526 *(0.760)**
Customer Staples	-1.445 *(0.806)*	-1.638 *(0.802)**	-1.384 *(0.803)*	-1.283 *(0.807)*
Industrials	-2.971 *(0.712)****	-3.022 *(0.709)****	-2.854 *(0.706)****	-2.817 *(0.710)****
Basic Materials	-2.361 *(0.807)***	-2.299 *(0.811)***	-1.978 *(0.804)**	-1.858 *(0.805)**
Energy	-4.473 *(0.883)****	-4.491 *(0.885)****	-4.326 *(0.882)****	-4.212 *(0.892)****
Utilities	-3.442 *(0.778)****	-3.495 *(0.780)****	-3.286 *(0.778)****	-3.180 *(0.784)****
Country variables				
Belgium	-1.283 *(0.437)***	-0.926 *(0.419)**	-1.106 *(0.420)***	-1.329 *(0.450)***
Denmark	6.184 *(0.777)****	6.337 *(0.777)****	6.310 *(0.784)****	6.076 *(0.776)****
Spain	-0.554 *(0.403)*	-0.257 *(0.376)*	-0.267 *(0.391)*	-0.168 *(0.382)*
Finland	0.748 *(0.580)*	1.213 *(0.543)**	1.351 *(0.552)**	1.296 *(0.557)**
France	-0.973 *(0.327)***	-0.533 *(0.304)*	-0.512 *(0.304)*	-0.799 *(0.333)**
Ireland	-0.896 *(0.604)*	-0.406 *(0.594)*	-0.748 *(0.599)*	-0.982 *(0.627)*
Italy	-0.184 *(0.390)*	0.088 *(0.372)*	0.073 *(0.382)*	0.123 *(0.379)*
Luxembourg	-0.031 *(0.717)*	0.210 *(0.715)*	-0.070 *(0.716)*	-0.164 *(0.722)*
Netherlands	-0.151 *(0.538)*	0.099 *(0.528)*	0.111 *(0.525)*	0.003 *(0.530)*
Norway	2.030 *(0.670)***	1.841 *(0.665)***	1.720 *(0.663)***	1.792 *(0.655)***
Austria	-1.187 *(0.417)***	-1.128 *(0.412)***	-1.006 *(0.407)**	-1.156 *(0.418)***
Poland	2.652 *(1.051)**	2.428 *(1.035)**	2.289 *(1.036)**	2.210 *(1.028)**
Portugal	-0.832 *(0.535)*	-0.663 *(0.519)*	-0.619 *(0.536)*	-0.481 *(0.513)*
Sweden	4.566 *(0.502)****	4.571 *(0.497)****	4.606 *(0.504)****	4.351 *(0.498)****
Switzerland	1.061 *(0.384)***	1.253 *(0.370)****	1.372 *(0.367)****	1.231 *(0.378)***
United Kingdom	0.641 *(0.370)*	1.226 *(0.355)****	1.018 *(0.355)***	0.964 *(0.369)***
R-squared	5 232	5 241	5 249	5 254
Adjusted R-squared	0.200	0.196	0.197	0.197
N	0.195	0.192	0.192	0.192

Standard errors in parentheses. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Appendix 7: Regression results - ESG data from S&P Global on ROA

This table provides the detailed results obtained from regression models IX-XII. The dependent variable is measured by *ROA* and is observed at time *t+1*. The independent variables are the *total ESG score, environmental pillar, social pillar,* and *governance pillar* provided by S&P Global and are observed at time *t*. The control variables are *firm size* (natural logarithm of total assets), *leverage* (natural logarithm of total debt over total capital), and *risk* (historic beta) and are observed at time *t. Industry F.E.* is a dummy variable controlling for industry-specific variation. *Country F.E.* is a dummy variable controlling for country-specific variation.

	S&P Global			
	Model IX	Model X	Model XI	Model XII
Variables				
Intercept	38.33 *(3.920)***	37.98 *(3.908)***	37.95 *(3.803)***	38.43 *(3.889)***
Independent variables				
ESC Score	0.034 *(0.009)***			
Environmental		0.033 (0.009)***		
Social			0.035 (0.009)***	
Governance				0.032 (0.008)***
Control variables				
Firm size	-1.742 *(0.256)***	-1.730 *(0.256)***	-1.731 *(0.244)***	-1.728 *(0.251)***
Leverage	-1.052 *(0.194)***	-1.040 *(0.193)***	-1.044 *(0.193)***	-1.059 *(0.194)***
Risk	0.496 *(0.494)*	0.523 *(0.496)*	0.469 *(0.493)*	0.480 *(0.494)*
Industry variables				
Telecommunications	-3.585 *(1.554)**	-3.650 *(1.534)**	-3.421 *(1.547)**	-3.679 *(1.563)**
Health care	-1.632 *(1.385)*	-1.645 *(1.382)*	-1.584 *(1.380)*	-1.623 *(1.394)*
Financials	-2.352 *(1.585)*	-2.285 *(1.573)*	-2.305 *(1.560)*	-2.514 *(1.590)*
Real Estate	-1.775 *(2.352)*	-1.656 *(2.369)*	-1.664 *(2.358)*	-1.844 *(2.344)*
Cusomer Discretionary	-2.739 *(1.392)**	-2.676 *(1.389)*	-2.667 *(1.389)*	-2.812 *(1.395)**
Customer Staples	-2.113 *(1.475)*	-2.019 *(1.468)*	-1.992 *(1.469)*	-2.245 *(1.480)*
Industrials	-3.641 *(1.331)***	-3.548 *(1.323)***	-3.515 *(1.323)***	-3.727 *(1.341)***
Basic Materials	-1.825 *(1.501)*	-1.679 *(1.497)*	-1.746 *(1.499)*	-1.972 *(1.498)*
Energy	-3.703 *(1.508)**	-3.650 *(1.508)**	-3.651 *(1.506)**	-3.668 *(1.515)**
Utilities	-2.998 *(1.443)**	-2.935 *(1.435)**	-2.874 *(1.435)**	-3.089 *(1.452)**
Country variables				
Belgium	-0.733 *(0.645)*	-0.775 *(0.637)*	-0.831 *(0.656)*	-0.735 *(0.645)*
Denmark	8.942 *(1.136)***	9.041 *(1.146)***	8.907 *(1.132)***	8.833 *(1.123)***
Spain	-0.963 *(0.701)*	-0.853 *(0.702)*	-0.905 *(0.687)*	-0.980 *(0.690)*
Finland	0.116 *(0.906)*	0.219 *(0.899)*	0.216 *(0.891)*	0.035 *(0.899)*
France	-0.340 *(0.583)*	-0.323 *(0.589)*	-0.374 *(0.582)*	-0.250 *(0.576)*
Ireland	-0.157 *(0.940)*	-0.268 *(0.930)*	0.055 *(0.937)*	-0.522 *(0.907)*
Italy	0.123 *(0.653)*	0.185 *(0.657)*	0.156 *(0.643)*	0.066 *(0.649)*
Luxembourg	-0.218 *(1.009)*	-0.213 *(0.997)*	-0.187 *(1.024)*	-0.171 *(1.026)*
Netherlands	0.654 *(0.701)*	0.795 *(0.704)*	0.668 *(0.699)*	0.593 *(0.691)*
Norway	4.173 *(1.273)***	4.137 *(1.259)***	4.183 *(1.255)***	4.168 *(1.267)***
Austria	-1.235 *(0.661)*	-1.181 *(0.666)*	-1.174 *(0.661)*	-1.273 *(0.663)*
Poland	3.896 *(1.690)**	3.757 *(1.680)**	3.643 *(1.668)**	3.933 *(1.686)**
Portugal	-2.007 *(0.874)**	-1.954 *(0.881)**	-1.966 *(0.865)**	-1.982 *(0.870)**
Sweden	6.656 *(0.953)***	6.676 *(0.947)***	6.677 *(0.975)***	6.541 *(0.956)***
Switzerland	1.573 *(0.637)**	1.552 *(0.644)**	1.614 *(0.633)**	1.604 *(0.632)**
United Kingdom	0.914 *(0.577)*	0.917 *(0.586)*	1.059 *(0.578)*	0.862 *(0.576)*
R-squared	2 204	2 204	2 204	2 204
Adjusted R-squared	0.213	0.212	0.213	0.214
N	0.202	0.201	0.202	0.203

*Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001*