MSc Thesis

ESG influence on financial performance

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Abstract

This thesis looks at the impact of Environmental, Social and Governance (ESG) performance on financial outcomes for firms listed on the Euro Stoxx 50 index. The study applies Ordinary Least Squares (OLS) regression to explore the relationship between ESG scores and the financial metrics EBIT, ROE, ROA and Tobin's Q for the years 2024, 2023 and 2022. The findings show that ESG performance is positively associated with EBIT showing that sustainable business practices can enhance core business earnings. No significant relationship was found with ROE or ROA and a negative association was observed with Tobin's Q, showing market scepticism or delayed recognition of ESG benefits.

1. Introduction

Introduced in 2005, the term ESG, derived from the Responsible Investment movement, stands for Environmental, Social, and Governance. Originating from the report "Who Cares Wins: Connecting Financial Markets to a Changing World" by the United Nations (UN), ESG gained endorsement from 20 influential financial institutions. It serves as a framework to evaluate and disclose a company's non-financial conduct. The Paris Agreement, adopted in December 2015 during the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC), marks a pivotal moment in international efforts to combat climate change. Key components of the agreement, including its overarching objective to limit global warming, are the adoption of Nationally Determined Contributions (NDCs) as a flexible approach to emission reductions, the establishment of transparency and accountability mechanisms, the implementation of a global stocktake process, provisions for climate finance, recognition of adaptation and loss & damage, and the articulation of a long-term goal for achieving net-zero emissions. this was a first step in stopping global warming and the pollution of the world. Now governments have agreed to take it even further with the ESG implementation that will take place in 2025.

ESG-related activity can broadly be divided into two interconnected domains which are ESG investing and corporate ESG engagement. ESG investing can be categorized into three primary approaches (MSCI, 2018), each with distinct investment objectives. First, ESG integration focuses on enhancing the risk–return profile of a portfolio by incorporating environmental, social, and governance factors into investment decisions. Second, values-based investing aims to align an investor's portfolio with their personal beliefs and ethical standards. Finally, impact investing seeks to deploy capital to drive positive social or environmental change, such as advancing the decarbonization of the economy.

On the other hand, corporate ESG engagement refers to the actions and initiatives taken by firms to improve their performance on ESG-related issues. Stakeholders are increasingly calling for greater transparency regarding environmental and social concerns, prompting corporations to ramp up their reporting efforts on these issues. These reporting mechanisms, commonly known as sustainable reporting tools (SRTs), encompass various frameworks such as corporate social responsibility reporting, sustainable development reporting, triple bottom line, and Environment Social Governance (ESG) (Siew, 2015).

These two aspects are interconnected because firms with stronger ESG practices are more likely to attract ESG-conscious investors, which can potentially lead to financial advantages such as a lower cost of capital or better stock performance. The link between ESG performance and financial outcomes has gotten a lot of attention in academic research over the last 20 years. Many studies have looked into whether ESG practices actually help boost company value, reduce risk, or improve returns for shareholders. For example, Friede, Busch, and Bassen (2015) reviewed over 2,000 studies and found that most of them show a positive connection between ESG and corporate financial performance (CFP). Along the same lines, Eccles, Ioannou, and Serafeim (2014) showed that companies that got into sustainability early tended to do better than their peers over time, both in the stock market and in accounting terms.

Despite a growing body of global research, relatively fewer studies have focused specifically on companies listed on the Euronext Stock Exchange. Most academic work concentrates on U.S.-based firms or global indices like the MSCI World or S&P 500, leaving a notable gap in regional analysis. Given the Euronext's diverse composition, spanning multiple European economies and sectors, it provides a rich context to explore the financial implications of ESG adoption. Not all research is in favour of ESG however, some researchers argue that the costs of implementing ESG frameworks may outweigh the short-term benefits, particularly for small and medium-sized enterprises (SMEs) or companies operating in less-regulated markets (Margolis & Walsh, 2003).

This thesis will explore the changes that the new ESG regulations will bring to companies listed on the Euronext Stock Exchange, with a particular focus on how these regulations may influence ESG scores and their relationship with financial performance. The need for businesses to adopt responsible practices has been steadily gaining momentum over recent years, driven by several factors including heightened awareness of climate change, evolving societal expectations, and a growing acknowledgment of the interconnectedness between corporate behaviour and financial performance. As the urgency to address global challenges intensifies, the year 2025 is set as a deadline for countries and companies to be compliant with the new ESG regulations. The ESG framework consists of a set of criteria designed to give investors measurable insight into a company's environmental, social, and governance efforts. This thesis will try to contribute to the already existing knowledge about ESG effect on share price by doing a literature study and an analysis of a European stock index and trying to answer the following question:

RQ: How does ESG influence the financial performance of companies traded on the Euro Stoxx 50 index?

2. Conceptual Framework

2.1 What is ESG

Environmental, Social, and Governance (ESG) factors have become fundamental considerations in modern business practices, shaping investment strategies, corporate responsibilities, and operational decision-making. The idea of ESG is a different view of operations by firms from purely profit-driven decisions and models to more focus on sustainability, ethical responsibility, and long-term value creation. A high ESG score can make a company more attractive to investors, as it may indicate strong sustainability practices and lower risks related to environmental damage or poor corporate governance. On the other hand, companies with low scores may be less appealing to ESG-conscious or environmentally friendly investors. The integration of ESG into business strategies is supported by well-established theoretical frameworks, including Stakeholder Theory and Agency Theory. These perspectives provide valuable insights into ESG's growing influence in corporate governance and investment. Stakeholder Theory highlights the importance of aligning business operations with the expectations of various stakeholders, while Agency Theory underscores how ESG adoption can reduce agency conflicts and promote transparency. Both theories will be better explained later in the chapter. Together, these frameworks show how ESG creates and maintains corporate responsibility,

increases a firm's reputation, attracts responsible investment, and ensures sustainable growth. As the global business environment continues to evolve, ESG will remain a big influence shaping the future of strategic decision-making and corporate governance.

Environmental, Social, and Governance (ESG) factors are commonly evaluated using a scoring system, where each of the three pillars receives a score that contributes to a total ESG score. This scoring method is widely used to assess how well a company performs in relation to sustainability, ethical responsibility, and corporate governance practices. In this way ESG scores offer investors and stakeholders a quantifiable measure of a company's commitment to these factors, guiding decisions regarding responsible investment and corporate strategy. There is however a problem with the ESG concept since there are no clear and agreed upon rules for how to measure it. This means different people or groups can come up with very different ESG indicators. Without standard rules, ESG can be confusing and hard to rely on. (KAŹMIERCZAK, 2022). Refinitiv or LSEG, the name they use at the moment is a bit hard to determine, a well known ESG data provider decides on the scores based on hundreds of key performance indicators and benchmarks over 70% of global market capitalization, making it one of the most comprehensive and widely used ESG rating systems. These scores help to provide a standardized framework for comparing companies across industries and places on earth in terms of their willingness and ableness to report in fashion that the ESG criteria requires. In Europe, ESG initiatives are gaining substantial traction according to the OECD. The OECD states that over 80% of large publicly listed companies in Europe report ESG metrics. This in itself is already quite the feed. The European Green Deal and mandatory ESG disclosure rules are also increasing transparency and accountability across sectors. This regulatory momentum has contributed to Europe being a global leader in ESG integration, both in policy and in corporate practice (OECD, 2024). The ESG score is made up of 3 sub scores which are the Environmental, Social and governance score (KAŹMIERCZAK, 2022). The ESG scores are ranged from 0 to 100.

ESG score = Environmental score + Social score + governance score

Environmental factors focus on how a company uses natural resources and how its activities affect the environment. This includes the energy it consumes, its gas emissions, how much waste it produces and how that waste is handled as well as its overall impact on ecosystems and biodiversity (KAŹMIERCZAK, 2022).

Social factors look at how a company's operations affect people which are both inside and outside the organization. This covers relationships with employees, customers, suppliers and the local community reflecting how responsible the company acts within its social environment (KAŹMIERCZAK, 2022).

Corporate governance looks at the internal rules and systems a company uses to manage itself. These include processes, policies and controls that help ensure the business is run effectively, follows legal requirements and makes decisions that consider the interests of external stakeholders, especially investors (KAŹMIERCZAK, 2022).

2.2 ESG theories

2.2.1 Stakeholder Theory: Balancing Interests for Long-Term Success

Stakeholder theory, as introduced by Freeman (1984), says that businesses should make clear what their decisions do to all parties affected by them. These parties are for example shareholders, employees,

customers, suppliers, local communities, and the environment. This theory is a different view compared to the traditional shareholder-centric view. It calls for a more inclusive approach that ensures long-term corporate sustainability and societal well-being. From an ESG perspective, integrating stakeholder concerns into business strategies fosters resilience and ethical responsibility. Companies can benefit from better trust among stakeholders, enhance brand reputation, and secure long-term profitability when they proactively engage with ESG issues like climate change mitigation, labour rights and ethical supply chain management. Porter claims that organizations who invest in renewable energy not only reduce operational costs over time but also demonstrate a commitment to environmental wellbeing. This can in turn attract sustainability-conscious investors and customers (Porter & Kramer, 2011). Ignoring ESG concerns can have significant downside like reputational damage, regulatory penalties, and loss of consumer confidence. An example of this could be corporations facing allegations of labour exploitation or environmental degradation suffering from declining stock prices and consumer boycotts. so, we can say that stakeholder-oriented ESG integration is not only good for ethical considerations, but it is also beneficial as a strategic risk management tool. Another example of a well known reputational risk is greenwashing. Greenwashing means that companies exaggerate or falsely communicate their ESG efforts to appear more sustainable than they truly are (Delmas et al, 2011). Greenwashing can damage stakeholder trust in the company and its leadership. It can also come with scrutiny which in turn will damage brand value. Studies show that consumers and investors are increasingly aware of the impact companies have on the environment in general and want the companies to try to minimise their impact. Companies which turn out to put out misleading ESG claims often experience more severe backlash than those who are transparently working on improvements (Torelli, Balluchi, & Lazzini, 2020). Therefore, while stakeholder theory supports ESG adoption for reputational gains, it needs a true and full commitment to transparency and measurable outcomes to avoid reputational harm.

2.2.2 Agency Theory: Reducing Conflicts Between Owners and Managers

Agency theory, as discussed by Jensen and Meckling (1976), examines the conflicts that arise when corporate managers (agents) do not always act in the best interests of shareholders (principals). This misalignment of interests often leads to inefficiencies, short-term profit maximization and a lack of transparency. ESG principles help bridge this gap by creating accountability and aligning managers gain with long-term corporate success if they are implemented well. For example, companies with strong ESG policies attract investors by reducing risks associated with poor corporate governance, environmental liabilities, and unethical labour practices (Whelan et al., 2021). Transparent ESG reporting ensures that managerial decisions align with the broader interests of shareholders and stakeholders alike by using sustainability disclosures, carbon footprint assessments, and social impact metrics. By embedding ESG criteria into executive compensation structures, businesses can further incentivize responsible management practices and long-term value creation. We have even seen the change that regulatory bodies and institutional investors increasingly demand ESG compliance because they recognize its role in mitigating systemic risks. Firms that fail to integrate ESG considerations into their corporate governance frameworks may face divestment, increased regulatory scrutiny, and lawsuits. on the other side we see companies that embrace ESG

transparency and accountability tend to attract long-term capital from socially responsible investors and benefit from enhanced financial performance (Eccles et al, 2014). Greenwashing can also be a problem in the communication between the owners and the managers. If this comes out that managers greenwash the companies reports, it can seriously damage the relationship between management and the owners.

So, both stakeholder theory and agency theory provide support for the hypothesis that ESG performance has a positive influence on financial performance, but they do it from a different theoretical perspective. Stakeholder theory suggests that firms engaging in ESG practices are more likely to build trust and long-term relationships with various stakeholders. This can lead to improved reputation, increased customer loyalty and enhanced operational stability. Agency theory on the other hand focuses on the internal dynamics of the firm. It proposes that ESG disclosure and governance mechanisms can reduce agency conflicts between managers and shareholders by promoting transparency and aligning managerial decisions with long-term value creation. While stakeholder theory emphasizes the benefits of broader stakeholder engagement, agency theory highlights the role of governance and accountability. Despite these differences both frameworks predict a positive relationship between ESG performance and financial outcomes. They therefor offer theoretical justification for the research hypothesis.

3. ESG and financial performance

3.1 Overall ESG Score and Financial Performance

The link between Environmental, Social, and Governance (ESG) factors and Corporate Financial Performance (CFP) has been widely researched. CFP is measured using both accounting-based indicators and market-based indicators. Accounting-based measures include metrics such as return on assets (ROA), return on equity (ROE), and net income, reflecting a company's internal efficiency and profitability. Market-based measures include stock price performance and Tobin's Q, which capture investor perceptions and market valuation of a firm. Friede, Busch, and Bassen (2015) did a review of 60 studies analysing over 3,700 results from more than 2,200 individual studies showing strong evidence that ESG investing can be financially beneficial, even though many investors remain sceptical. This scepticism may come from portfolio studies, about 150 in total, which often show mixed or neutral results due to various risks and costs linked to mutual funds according to Friede, Busch, and Bassen (2015). However, over 2,100 company-specific studies suggest that ESG practices generally have a positive impact on financial performance. Research also shows that ESG investment performs well in different market areas, especially in North America, Emerging Markets, and asset classes beyond stocks. We can however not see financial markets consistently adapting to recognize the benefits from ESG. Since the mid 1990s, studies have shown a steady positive connection between ESG and CFP which supports the benefit from long-term ESG investment. The review written by Friede, Busch, and Bassen (2015) highlights that responsible investing is crucial for investors to meet their duties while also supporting broader societal goals.

Whelan et al (2021) states that most papers which he used in his study suggest that companies with strong ESG practices tend to perform better financially. They often see higher ROE, ROA, and stock prices. For investors, ESG-focused strategies can generate returns that match or even exceed traditional investment approaches, especially over the long term. ESG investments also seem to provide protection during economic or social crises. Importantly, very few studies have found a clear negative link between ESG and financial performance. Another study done by Cheng et al. (2023) also provide strong support using a massive dataset of 24,000 observations, showing a significant positive relationship between ESG ratings and CFP. This helps the idea that ESG helps build strong and long-term stakeholder trust. These studies are in line with what we

expect when we look at the Stakeholder Theory: even if ESG initiatives come with short-term costs, the long-term value creation which comes in the form of better reputation, customer loyalty, and operational stability should in the end pay off. Elmarzouky et al. (2022) did a study on the relationship between ESG disclosure and the financial performance of Norwegian listed firms. This paper used ESG disclosure, which was measured with the Thomson Reuters Eikon ESG disclosure score, while financial performance was assessed through ROA and Tobin's Q. the results of this study were not definitive since the panel data regression analysis had mixed results. The findings indicate a significant relationship between ESG initiatives and financial performance. Specifically, the regression model with ROA as the dependent variable suggests a negative impact of ESG initiatives. However, Tobin's Q appears to increase with a higher ESG score, indicating a positive association (Elmarzouky et al., 2022). This paper is interesting for this study because it aims to do the same study but for the European market. We could therefore compare the results and see if the markets behave the same way. This is also confirmed by Alareeni et al. Who found that ESG disclosure had a significant positive impact on all firms' operational, financial, market performance (ROA, ROE and Tobin's Q) (Alareeni et al. 2020).

We can therefore state our hypothesis;

H1: ESG score positively affects a firm's financial performance.

Figure 1 below shows the main idea of the research. It assumes that a company's ESG performance has a positive effect on its financial performance. This is based on earlier studies and theories like Stakeholder Theory and Agency Theory, which were discussed earlier. In this framework, ESG performance is the independent variable and financial performance is the dependent variable, measured by ROA, ROE, EBIT and Tobin's Q. The hypothesis (H1) is that higher ESG scores lead to better financial results. To make sure the results are accurate, the model includes control variables: firm size, market-to-book ratio, and leverage. These are common factors that also influence financial performance and help isolate the effect of ESG.

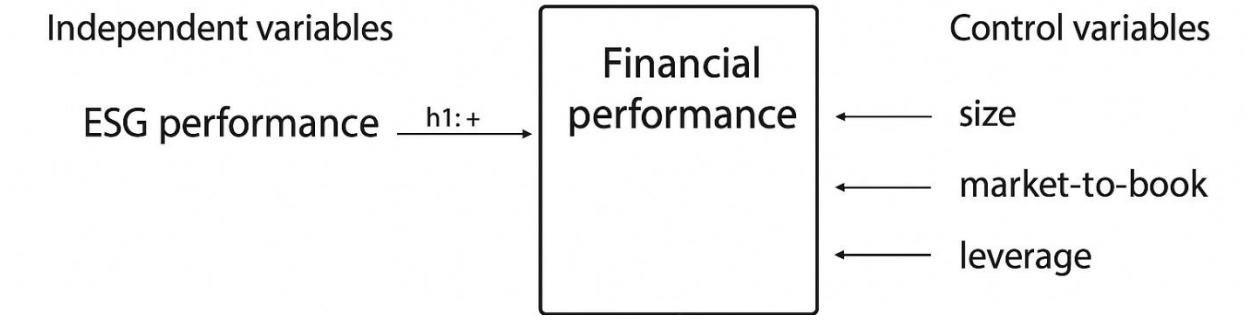


Figure 1: conceptual framework

3.2 Social Pillar and Financial Performance

Al Amosh et al. (2022) found that companies that prioritize social issues tend to be viewed more favourably by a wide range of stakeholders. This boosts their reputation which in turn strengthens their market position and improves their financial performance. The study that focusses on companies in the Levant region

suggests that strong social performance significantly improves both ROA and Tobin's Q among firms this shows the financial benefits of investing in people and communities.

Kim et al. (2021) seems to agree that companies with higher ESG scores tend to be more profitable. According to Kim et al, their data shows that ESG factors have a stronger effect on profitability for larger firms. Among the three ESG components, corporate governance has the biggest influence on profitability, especially in companies with weak governance structures. When it comes to credit risk, all ESG factors matter. Higher social, governance, and total ESG scores improve a company's credit rating, but surprisingly, a higher environmental score lowers it. The study does find that the social factor has the strongest positive impact on credit ratings. These findings confirm that ESG factors influence both financial performance and risk, but their effects depend on company size and specific ESG categories (Kim et al., 2021). In the before mentioned study by Whelan et al. (2021) it is stated that ESG and the social dimension becomes even more important crisis like the COVID-19 pandemic. Since companies with higher ESG scores tend to show greater resilience. 24 of 26 ESG index funds used in the study outperformed their conventional counterparts in the first quarter. At the end of the third quarter 45% of ESG-focused funds outperformed their index (Whelan et al., 2021).

3.3 Governance Pillar and Financial Performance

A study done in 2017 by Velte does an analysis includes 412 firm-year observations from 2010 to 2014. It finds that overall ESG performance, as well as each of its components, has a positive effect on accounting-based financial performance, measured by ROA. Among the components, governance performance has the strongest influence on financial results according to the study. Velte explains this by stating that Germany has had a longer history of corporate governance reporting since the introduction of the Corporate Governance Code in 2002 or because stakeholders see governance as especially important.

3.4 Environmental Pillar and Financial Performance

In a study done by Teng et al. in 2022, they found that the relationship between environmental performance and CFP is not always positive but may be nonlinear. This means that moderate investment in environmental activities boosts performance but going overboard and spending too much could lead to lower returns due to rising costs. In a study done by Makridou et al. (2024) findings show that the profitability of energy companies is slightly and negatively influenced by their overall ESG performance. However, a separate analysis of the ESG subcomponents reveals that environmental responsibility has a significant negative impact. However social and governance responsibilities show a positive, though statistically insignificant, relationship with corporate financial performance. This thesis therefor wants to check if the Environmental pillar has a positive or negative influence on financial performance.

4. Data and methodology

4.1 data

4.1.1 Data source

We want to study the effect of ESG on financial performance. To do this we need access to a reliable source of financial data. We will need detailed financial information which is not always available or even behind a paywall. ESG rating agencies are independent organizations that assess companies based on environmental, social, and governance factors. Some well-known agencies include Bloomberg ESG Data Services, Dow Jones Sustainability Index, MSCI ESG Research, Sustainalytics, Refinitiv Eikon Datastream, S&P Global, ISS ESG, Vigeo/EIRIS, Fitch Ratings, and Moody's Investors Service. Among these, Refinitiv is widely recognized for its ESG ratings. ESG scores, ranging from 0 to 100, allow investors to compare companies within the same industry or across different sectors. Refinitiv provides broad ESG coverage, assessing over 630 company-level metrics. It focuses on 186 key factors that are most relevant to different industries. These factors are grouped into three main categories: environmental, social, and governance. The final ESG score reflects a company's overall ESG performance, based on publicly available information. The ratings are standardized to ensure fair comparisons across industries (Halid et al., 2023). Refinitiv Eikon is a financial platform that offers real-time data, company performance reports, and ESG ratings. When looking to similar studies conducted at the UTwente we can see a large-scale use of this database. Using this database ensures that the research is based on trustworthy data, making the analysis more reliable. Therefore, this study uses Refinitiv Eikon.

4.1.2 Sample selection

Data for this study is primarily obtained from Refinitiv Eikon, a leading financial data provider. To investigate the relationship between ESG and financial performance the thesis will make a regression analysis of financial performance indicators on data collected from LSEG Eikon. This thesis will look at the STOXX EUROPE 50 INDEX (EUR). We use this index because it is a representation of the European market. The Euronext stock exchange includes major European markets such as Amsterdam, Paris, Brussels, Dublin, Lisbon, Milan, and Oslo. The decision to focus on Euronext rather than U.S.-based markets like the NYSE or NASDAQ is intentional since this study aims to look at ESG influence on financial performance in Europe. The American market and European differ in the way firms in the US are currently under a voluntary disclosure regime while EU firms are under a mandatory disclosure regulation since 2017 (Rezaee et al., 2023).

The analysis covers a period of three years, from 2022 to 2024. This time frame was chosen to ensure comparability with previous academic research on the topic, particularly studies conducted at the University of Twente, which have also employed a three-year observation window like M.Roos, 2023 and R.Oddo, 2022. A consistent time horizon enhances the ability to compare findings between studies.

The final sample consists of publicly listed European companies with complete ESG ratings and financial data available for the entire three-year period from 2022 to 2024. A total of 50 firms were analysed, and their industries were categorized according to the Global Industry Classification Standards (GICS). A list of the companies can be found in the appendix. To ensure statistical robustness and interpretability, the original sectoral classification was consolidated into five broader categories: Financial, Healthcare, Industry, Consumer Goods, and Technology. This grouping balances conceptual clarity with adequate sample size within each category. Details of the recategorization can be found in the appendix.

4.2 methodology

4.2.1 Applicable Models

Ordinary Least Squares (OLS) is a fundamental statistical method used in linear regression analysis to estimate the relationship between a dependent variable and one or more independent variables. The primary objective of OLS is to minimize the sum of the squared differences between the observed values and the predicted values generated by the regression model, commonly referred to as residuals (Wooldridge, 2016). This method assumes that the relationship between the variables is linear, the errors are normally distributed with a mean of zero, and there is no perfect multicollinearity among the independent variables.

OLS is widely applied in economics, finance, and the social sciences due to its simplicity, interpretability, and efficiency under the classical linear regression model assumptions (Gujarati & Porter, 2009). In a simple linear regression model, the OLS estimator identifies the line that best fits the data by minimizing the residual sum of squares (RSS), resulting in coefficient estimates that are unbiased, consistent, and efficient under the Gauss-Markov theorem (Stock & Watson, 2020).

The general form of a simple OLS regression model is:

$Y_i=\beta_0+\beta_1 X_i+\varepsilon_i$

where Y_i is the dependent variable, X_i is the independent variable, β_0 is the intercept, β_1 is the slope coefficient, and ε_i is the error term. When multiple independent variables are involved, the model is extended to a multiple linear regression framework, but the estimation principles remain the same. Despite its widespread use, OLS has limitations. The reliability of OLS estimates depends heavily on meeting its assumptions. Violations such as heteroscedasticity, autocorrelation, or multicollinearity can lead to biased or inefficient estimates (Greene, 2018). Therefore, diagnostic testing and model validation are essential components of regression analysis when using OLS.

The analysis checks the influence of ESG factors on four financial performance indicators: Earnings Before Interest and Taxes (EBIT), Return on Equity (ROE), and Return on Assets (ROA) and Tobin's Q. These indicators were selected to provide a view on profitability from both accounting and investor return perspectives.

The primary model used in this thesis is estimated as follows:

$FP_{it} = \beta_0 + \beta_1 * \text{ESG score}_{it} + \beta_2 * \text{Firm size}_{it} + \beta_3 * \text{Market value to book ratio}_{it} + \beta_4 * \text{financial leverage}_{it} + \beta_5 * \text{Sector}_{it} + \beta_6\ \text{time}_{it} + \varepsilon_i$

FP_{it}= Firm Performance of firm i at time t

ESG Score_{it}= Environmental, Social, and Governance score

Firm Size_{it}, $\text{Market Value to Book Ratio}_{it}$, $\text{Financial Leverage}_{it}$= Control variables

Sector_{it} = Industry sector fixed effects

Time_{it}= Time fixed effects

ϵ_i= Error term

Financial Performance is defined as EBIT, ROE, ROA and Tobin's Q. Because the study looks at data over a three-year period, the variable "t" is used to indicate time in the model. The letter "i" is used to identify the different companies included in the analysis.

4.2.2 Independent Variables: ESG Score

For this study, the ESG score serves as the primary independent variable. ESG indicators are non-financial factors that are gaining more importance and popularity among investors. (Halid et al., 2023) The ESG score is broken down into three sub-scores: the environmental score, the social score, and the governance score. These three scores combined make the overall ESG score for a firm.

4.2.3 Dependent Variables: EBIT (Earnings Before Interest and Taxes), ROE, ROA and Tobin's Q

EBIT is a financial measure that shows a company's profitability before deducting interest expenses and income taxes. It reflects how much profit a company generates from its core operations, excluding the effects of financing and tax decisions. A study done by Pulino et al. (2022) and D'Amato et al. (2023) investigated the relationship of ESG on EBIT. This thesis will do the same. The EBIT is useful for comparing companies in different industries because it focuses only on operating performance. In this thesis for the regression, the natural log of the EBIT will be used. EBIT is calculated as:

EBIT=Revenue−Operating Expenses

ROE measures a company's profitability in relation to shareholders' equity. It indicates how efficiently a company uses its shareholders' investments to generate profit. A higher ROE suggests better financial performance and effective use of equity capital. This metric helps investors compare companies within the same industry and assess their ability to generate returns on invested capital. A lot of research on ESG use ROE as a dependent variable. An example of that research is a study done by Alareeni in 2020. ROE It is calculated as:

ROE=Net Income/ Shareholders equity

ROA evaluates how efficiently a company uses its assets to generate profit. It indicates how well a company manages its assets to produce earnings, regardless of financing sources. A higher ROA means the company is effectively utilizing its assets to generate income. This is particularly useful when comparing asset-heavy businesses, such as manufacturing or real estate firms. ROA is used as a dependent variable by Pulino et al. (2022) and by Alareeni et al. (2020). ROA is calculated as:

ROA=Net Income/ Total Assets

Tobin's Q is a way to measure how the market values a company. If the number is higher than 1.0, it means the company is worth more in the market than it would cost to replace its assets, which may mean it's overvalued. If the number is less than 1.0, the company might be undervalued because it's worth less than the cost to replace its assets (Hayes, 2021). Tobin's Q is used by Alareeni et al. (2020) as a dependent variable in their study. Tobin's Q is calculated as:

Tobin's Q=Total Asset Value of Firm/ Total Market Value of Firm

4.2.4 Control Variables

We will follow the example set by Pulino et al (2022) and Atan et al (2018) in their studies. therefore, we will check for market value to book ratio, firm size, and financial leverage to ensure a more accurate analysis of the relationship between ESG scores and financial performance. The market value to book ratio (M/B ratio) shows how the market values a company relative to its book value, with a higher ratio indicating strong growth expectations and a lower ratio suggesting undervaluation or financial problems. Book value means the total value of a company's assets minus its liabilities, as recorded on its balance sheet. Firm size is an important factor, as larger firms tend to have more stable earnings, greater resources, and higher investor confidence, which can impact stock performance. We will measure it in the natural logarithmic of the total assets of the company. Financial leverage, measured by the proportion of debt to equity, influences a company's financial risk and can affect stock prices. By including these control variables, we minimize potential biases and improve the reliability of our results. In addition, the thesis will include a sector and year control. The year controls will be the three years the data has been taken from.

4.2.4.1 Sector Recategorization

The Global Industry Classification Standard (GICS) is a four-level hierarchical system used to categorize companies by industry. It includes 11 sectors, 25 industry groups, 74 industries, and 163 sub-industries. GICS is widely recognized and utilized as a key analytical framework in investment research, portfolio management, and asset allocation strategies (Refinitiv, 2025). However, since we run our regression on 50 companies three times there is the worry of overfitting when we use the original GICS scores. The sectors will therefore be divided into five broader groups: Financial, Healthcare, Industry, Consumer Goods, and Technology. Reducing the number of sector categories helps to mitigate the risk of overfitting and improves model stability. Because for example the original sectors such as Information Technology and Communication Services included only two firms each. Grouping them with conceptually similar sectors ensures more balanced representation across categories.

The sector recategorization is based on economic similarity and how companies operate. The Industry group includes Industrials, Materials, Energy and Utilities. These sectors rely on large investments in physical assets and infrastructure. Consumer Goods has both Consumer Staples and Consumer Discretionary, since both serve end-users and are shaped by consumer demand. Technology combines Information Technology and Communication Services because both focus on digital products and communication systems. Financial and Healthcare remain separate since they did not fit in any other group.

5. Empirical results

5.1 Descriptive statistics

Table 5-1 shows the descriptive statistics of the variables used. The ESG scores for the 50 companies in the sample over the last three years ranged from 54.64 to 95.57, with an average of 82.47. This suggests strong overall ESG performance, especially compared to the global average of 46 for large companies (S&P Global, 2021).

The financial performance of the companies showed a lot of differences. ROE had an average of 0.24, meaning that companies made a 24% return on their equity, although some had negative returns as low as –0.27. ROA was lower, with an average of 0.08 and a range from –0.13 to 0.38. EBIT also varied widely, from a loss of 571 million to a profit of 42,435 million. This shows a big gap in how profitable companies were from their operations. There was one company that had a negative EBIT for 2 years, this company is excluded from the anaylisis in those 2 years. Tobin's Q averaged 1.42, with values ranging from 0.02 to 10.62, reflecting big differences in how the market values these companies. These wide variations are in line with earlier research, such as Friede, Busch, and Bassen (2015), who observed that firm-level financial performance often shows large variation when examining ESG effects, especially across industries. Alareeni and Hamdan (2020) found comparable ROE and ROA averages in their study of S&P 500 firms. In their study ESG impact varied significantly depending on firm characteristics and sector.

For the control variables, the Market-to-Book Ratio had an average of 3.93, with values between 0.40 and 22.50. This means some companies were priced much higher or lower than their book value. Leverage had an average of 1.07, showing that most companies had about the same amount of debt and equity. Firm Size had an average of 380499 million, with values from 17250 million to 2914167 million in total assets.

Overall, the wide range of values across all these measures shows that the sample includes a diverse group of companies, which helps make the results of the later analysis more reliable and applicable to different kinds of firms.

	N	Minimum	Maximum	Mean	Std. Deviation
			Independent variable		
ESG Score	150	54,64	95,57	82,47	8,76
			dependent variables		
ROE	150	-0,27	1,10	0,24	0,19
ROA	150	-0,13	0,38	0,08	0,08
EBIT (M)	150	-571	42435	12480	8237
EBIT (LN)	148	19,00	24,47	23,06	0.69
Tobins Q	150	0,02	10,62	1,42	1,88
			control variables		
Market to book	150	0,40	22,50	3,93	4,47
Leverage	150	0,13	4,80	1,07	0,89
Size (M)	150	17205	2914167	380499	611927
Size (Ln)	150	23,57	28,70	25,82	1,23

Table 5-1: descriptive statistics

5.2 Correlation matrix

To assess the interrelationships between the dependent, independent and control variables, a Pearson correlation matrix was made. The coefficients reflect the direction and strength of linear relationships among variables, with significance levels set at $p < .01$ (**) and $p < .05$ (*). Table 5-4 presents a Pearson correlation matrix for the dependent, independent and control variables. It however excludes the variables sector and year to make it more understandable. The sample distribution across the sectors is shown in table 5-2.

Sector	N
Financial	12
Healthcare	7
Industry	17
Consumer Goods	10
Technology	4

Table 5-2 sample distribution

5.2.1 ESG Score and Financial Performance

The ESG score over the past three fiscal years shows correlations with the selected financial performance measures. A significant negative correlation was found between ESG score and ROA ($r = –.293$, $p < .01$), suggesting that firms with higher ESG performance tend to have lower asset efficiency. This aligns with prior research indicating that ESG investment may not always yield immediate financial returns, especially in capital-intensive sectors such as utilities, energy, and industrials. These industries typically require substantial fixed asset investments like power plants, refineries or heavy machinery. This means that ESG-related spending may take longer to translate into improved financial metrics like ROA. (Friede et al., 2015; Krüger, 2015).

In contrast, no significant correlation was found between ESG score and ROE ($r = –.067$), implying that equity returns are relatively unaffected by ESG performance. However, a positive correlation was observed between ESG score and EBIT over the last three years ($r = .312$, $p < .01$). This may indicate that ESG-aligned firms benefit from improved operational efficiency or reputational advantages (Clark et al., 2015; Eccles et al., 2014).

ESG score is also negatively correlated with Tobin's Q ($r = –.371$, $p < .01$) and the market-to-book ratio ($r = –.222$, $p < .01$). These findings suggest that firms with higher ESG scores are less likely to be rewarded with valuation premiums by the market. This could reflect investor scepticism or the market's tendency to underprice long-term ESG benefits in favour of short-term financial metrics (Bénabou & Tirole, 2010; Liang & Renneboog, 2017).

5.2.2 Capital Structure and Firm Size

A small but statistically significant positive correlation exists between ESG score and financial leverage ($r = .163$, $p < .05$), implying that firms with greater debt exposure may also exhibit stronger ESG disclosure or performance and may have access to cheaper debt. Additionally, ESG score is positively correlated with firm size, as measured by the logarithm of total assets ($r = .243$, $p < .01$). Larger firms may be more capable of allocating resources to sustainability initiatives or are more exposed to stakeholder pressure and regulatory obligations (Drempetic, 2020).

5.2.3 Financial Performance Interlinkages

There is a strong positive relationship between ROA and ROE ($r = .819$, $p < .01$), meaning that companies that use their assets more efficiently also tend to give higher returns to their shareholders. This supports common financial thinking that efficient use of assets leads to stronger financial performance. ROA is also strongly linked to Tobin's Q ($r = .831$, $p < .01$) and the market-to-book ratio ($r = .734$, $p < .01$), showing that the stock market often values companies more highly when they perform well operationally.

Company size is negatively related to both ROA (r = –.610, p < .01) and ROE (r = –.396, p < .01). This suggests that larger companies might have a harder time keeping their operations efficient or might get lower returns from their extra size, possibly due to complexity or slower decision-making.

5.2.4 Temporal Effects and Sectoral effects

Dummy variables representing fiscal years didn't have correlations with most financial or ESG variables. In the sector control there was correlation to be found. The Health Care sector shows a positive correlation with ESG scores (r = .166, p < .05), indicating stronger ESG performance among firms in this industry. In contrast, the Technology sector demonstrates a significant negative correlation (r = –.216, p < .01), suggesting lower ESG scores. The Consumer Goods sector also displays a negative correlation (r = –.126), highlighting weaker ESG performance in comparison to other industries. The correlation matrix containing the control variables can be found in the Appendix.

Mean control values	ESG	ROE	ROA	EBIT (M)	Tobin's Q
Financial	83,45	16,29%	1,12%	€ 14.069	0,08
Healthcare	86,06	33,78%	11,99%	€ 13.622	2,29
Industry	83,11	22,25%	7,35%	€ 11.775	1,08
Consumer Goods	80,27	27,47%	11,48%	€ 11.777	2,43
Technology	76,09	28,48%	12,75%	€ 10.463	2,80
2024	81,84	22,95%	7,41%	€ 12.257	1,40
2023	82,71	25,04%	7,75%	€ 12.602	1,48
2022	82,87	23,94%	8,12%	€ 12.580	1,37

Table 5-3: Mean values in control variables

Variable	1. ESG Score	2. ROE	3. ROA	4. EBIT	5. Tobin's Q	6. Leverage	7. Market-to-Book	8. Size
1. ESG Score								
2. ROE	–.067							
3. ROA	–.293**	.819**						
4. EBIT	.312**	.035	–.015					
5. Tobin's Q	–.371**	.610**	.831**	–.206*				
6. Leverage	.163*	–.053	–.373**	.176*	–.353**			
7. Market-to-Book	–.222**	.772**	.734**	–.219**	.859**	–.211**		
8. Size	.243**	–.396**	–.610**	.483**	–.651**	.574**	–.620**	

Table 5-4: correlation Matrix

5.3 Regression analysis

5.3.1 Assumption testing

Before interpreting the results, it is essential to verify that key assumptions of Ordinary Least Squares (OLS) regression are met. this study tests for heteroscedasticity, autocorrelation, and multicollinearity because these are common issues that can distort model estimates and lead to incorrect conclusions. Addressing these potential violations enhances the reliability and interpretability of the regression results.

5.3.1.1 Multicollinearity assumption test

Multicollinearity is when two or more independent variables are highly correlated. This condition does not violate the assumptions of OLS per se but can severely affect the interpretability and reliability of the regression coefficients. Specifically, multicollinearity inflates the standard errors of the coefficients, which may lead to non-significant results for predictors that are significant. It also makes the estimates highly sensitive to minor changes in the model or data.

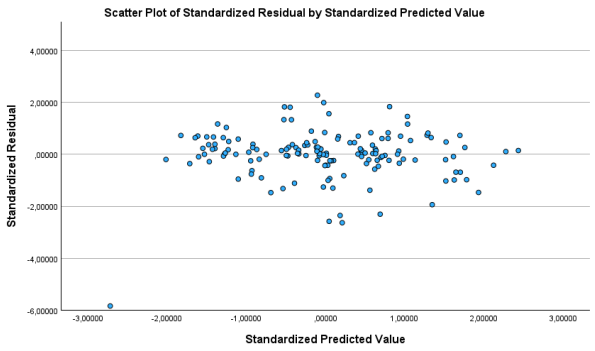
To detect multicollinearity, Variance Inflation Factor (VIF) and Tolerance values were examined. A VIF value exceeding 10 indicates a high degree of multicollinearity, while a Tolerance value below 0.1 also suggests potential multicollinearity issues. The results indicate that no violations of the linearity assumption are present.

Variable	VIF
ESG	1,49
Leverage	1,86
MtB	2,39
Size	8,11
sector	2,82
years	1,34

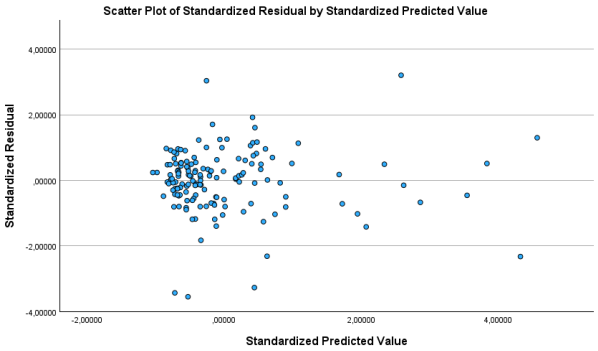
Table 5-5 average VIF scores

5.3.1.2 Heteroscedasticity

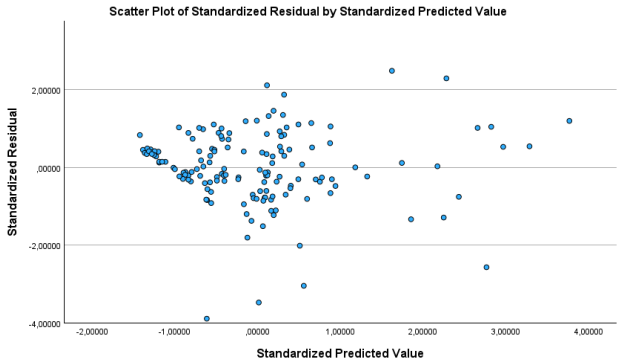
Heteroscedasticity means that the variance of the residuals is not constant across all levels of the independent variables. it is best in a regression model that the residuals are homoscedastic which means that they have equal variance. The presence of heteroscedasticity violates this assumption which results in inefficient estimators and biased standard errors. This can lead to incorrect statistical inferences such as misleading p-values and confidence intervals. heteroscedasticity was assessed using a residual scatterplot, where the standardized residuals were plotted against the predicted values. A random, pattern less distribution of residuals around zero would indicate homoscedasticity, which in our study is the case.



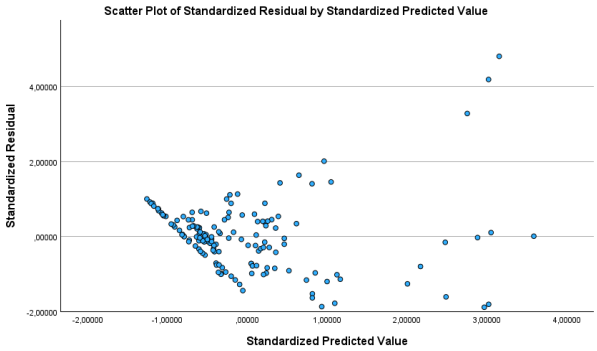
Plot EBIT



Plot ROE



Plot ROA



Plot Tobin's Q

5.3.1.3 Autocorrelation

When running a regression with panel data, it is important to check if the residuals are correlated with each other. To do this, the Durbin-Watson test was used. This test looks at how much the residuals change from one observation to the next to measure if there is autocorrelation. A Durbin-Watson (DW) test result that is close to 2 means there is no autocorrelation in the residuals. If the DW value falls between 0 and 2, it indicates positive autocorrelation, which means the residuals tend to be similar or follow the same pattern over time. On the other hand, if the DW value is between 2 and 4, it suggests negative autocorrelation, meaning the residuals tend to move in opposite directions. In practical terms, a DW value between 1.5 and 2.5 is usually considered normal and does not raise concerns about autocorrelation. Therefor in our data there is no problem.

variable	DW score
EBIT	2.099
ROE	1.902
ROA	1.982
Tobin's Q	1.901

Table 5-6 Durbin-Watson scores

5.4 regression results

Return on Equity regression results

The adjusted R^2 value for the ROE model is 0.582, indicating that approximately 58.2% of the variation in ROE across firms can be explained by the variables included in the model. This suggests a poor model fit, since an R^2 value is considered good if its above 0,7. Looking at the key independent variable, the ESG score shows a weak positive relationship with ROE ($p = 0.101$, $t = 1.653$) but this effect is not statistically significant at the 5% level. Even if we only take the direction in account, the coefficient implies a 1 to 2 percentage point increase in ROE for every one-point increase in ESG score. This effect is small and unlikely to significantly impact firm strategy or shareholder returns in the short term. Among the control variables, the market-to-book ratio is a highly significant predictor ($p < 0.001$, $t = 11.811$). This suggests that firms with higher market valuations relative to book value tend to deliver substantially better shareholder returns. This reflects investor confidence and stronger expected profitability. Firm size and leverage have small, statistically insignificant effects which indicates minimal practical relevance in this context. The Financial sector shows a highly significant negative effect on ROE ($p < 0.001$, $t = -8.431$) which suggests that firms in this sector experience substantially lower returns on equity compared to other sectors. This could be because the finance sector is capital-intensive and therefor might depress ROE due to regulatory capital requirements and conservative payout policies. In contrast, the Healthcare sector ($p = 0.020$, $t = 2.346$) and the Consumer Goods sector ($p = 0.012$, $t = 2.538$) both shows statistically significant positive effects on ROE. This indicates that these industries tend to offer stronger equity returns. The magnitude of these effects implies that sector membership could meaningfully impact shareholder value. However, the Technology sector does not exhibit a statistically significant relationship with ROE. This implies that tech firms in this sample do not consistently outperform or underperform other sectors in terms of equity returns.

Return on Assets Regression Results

The adjusted R^2 for the ROA model is 0.602, indicating a relatively good model fit with 60.2% of variance explained. However, the ESG score displays a slightly negative but statistically insignificant relationship with ROA ($p = 0.140$). This might imply that higher ESG performance could lead to marginal reductions in asset efficiency because ESG investments do not directly enhancing short-term asset returns but the small magnitude and lack of significance suggest this effect is not meaningful in practice. The market-to-book ratio is again a highly significant and economically important variable ($p < 0.001$, $t = 10.113$) indicating firms with higher relative market values utilize assets more effectively. Neither firm size ($p = 0.881$) nor leverage ($p = 0.141$) show significant or economically substantial effects.

For ROA, none of the sector coefficients are statistically significant (all p-values > 0.05) indicating that sector differences do not have a strong impact on how efficiently firms convert assets into profits in this sample. This suggests that asset utilization is relatively the same across industries.

Earnings Before Interest and Taxes Regression Results

The adjusted R^2 for the EBIT model is 0.630, indicating a reasonably good fit. The most noteworthy result here is that the ESG score is positively and statistically significantly related to EBIT ($p = 0.005$, $t = 2.850$). The coefficient indicates that for every one-point increase in ESG score, EBIT increases by approximately 5.1%. Given that the average EBIT in the sample is €12.48 billion, this translates into an increase of roughly €636

million, which is a substantial and economically meaningful impact. This finding strongly suggests that ESG performance can drive improvements in core operational efficiency and profitability, supporting the notion that sustainability efforts benefit internal business performance. On top of that, firm size has a strong positive and statistically significant effect ($p < 0.001$, $t = 9.699$). This reflects the expected operational advantages of larger firms such as economies of scale, broader networks, and resource access. The market-to-book ratio also plays a significant role ($p < 0.001$), indicating that more highly valued firms tend to have stronger earnings power. Leverage, however, is not statistically significant ($p = 0.223$), suggesting that debt levels do not materially affect EBIT within this sample.

Sector effects are clearer when examining EBIT. The Financial sector again shows a statistically significant negative effect ($p = 0.003$, $t = –2.977$). we can therefor say that financial firms generate significantly lower operating income likely due to their business models relying more on interest and investment income than on traditional operations. The Consumer Goods sector shows a positive and statistically significant relationship with EBIT ($p = 0.030$, $t = 2.186$). This means that firms in this sector have higher core operating profits. This could be caused by stable consumer demand or pricing power. The Healthcare and Technology sectors both have positive coefficients but do not reach statistical significance. So, these industries may be associated with stronger operating income but the variation within them prevents clear generalizations.

Tobin's Q Regression Results

The adjusted R^2 for the Tobin's Q model is 0.810, the highest among all models, showing that 81.0% of the variation in market valuation is explained. This shows excellent explanatory power. The ESG score is statistically significantly negatively related to Tobin's Q ($p = 0.004$, $t = –2.957$). This coefficient implies that a one-point increase in ESG score reduces Tobin's Q by approximately 0.03 points. Considering the average Tobin's Q is 1.42, this equates to a 2 to 3% decrease in market valuation. this suggests that investors may either discount ESG efforts in the short term or remain uncertain about their financial payoff. This may reflect market scepticism or a lag in recognizing the value of ESG initiatives. As in the other models, the market-to-book ratio is a strong positive predictor ($p < 0.001$, $t = 13.713$), indicating that high market valuations are connected to firm fundamentals. Neither firm size ($p = 0.175$) nor leverage ($p = 0.061$) show statistically or economically robust effects.

The Healthcare sector shows a positive and statistically significant effect ($p = 0.048$, $t = 1.999$), meaning firms in this sector are valued more highly by the market. The Consumer Goods sector also has a strong positive relationship with Tobin's Q ($p < 0.001$, $t = 4.189$), which implies a substantial premium in market valuation. The Technology sector similarly shows a significant positive effect ($p = 0.042$, $t = 2.057$), which is in line with the thinking that technology is the future. Interestingly, the Financial sector does not have a significant relationship with Tobin's Q ($p = 0.589$), suggesting that market valuation of financial firms is not markedly different from other sectors.

Variable	ROE	ROA	EBIT	Tobin's Q
Constant	0.553 (-0.595)	0.868 (0.167)	0.897 (-0.13)	0.047 * (2.000)
ESG Score	0.101 (1.653)	0.140 (-1.484)	0.005 ** (2.850)	0.004 ** (-2.957)
Size	0.711 (0.371)	0.881 (0.150)	<0.001 *** (9.699)	0.175 (-1.364)
Market to Book	<0.001 *** (11.811)	<0.001 *** (10.113)	<0.001 *** (5.015)	<0.001 *** (13.713)
Leverage	0.120 (1.564)	0.141 (-1.481)	0.223 (-1.224)	0.061 (-1.892)
Financial sector	<0.001 ** (-8.431)	0.165 (-1.396)	0.003 ** (-2.977)	0.589 (0.541)
Healthcare sector	0.020 * (2.346)	0.494 (0.686)	0.093 (1.692)	0.048 * (1.999)
Consumer Goods sector	0.012 * (2.538)	0.883 (0.147)	0.030 * (2.186)	<0.001 ** (4.189)
Technology sector	0.208 (-1.265)	0.540 (-0.615)	0.435 (0.784)	0.042 * (2.057)
Year 2023	0.411 (0.824)	0.572 (0.567)	0.770 (0.293)	0.856 (0.182)
Year 2022	0.413 (0.821)	0.631 (0.482)	0.358 (0.922)	0.946 (-0.068)
adj. R^2	0.582	0.602	0.630	0.810
Significant Codes: '*' 0,001 '**' 0,01 '*' 0,05 ; t-values are noted in parentheses.**				

Table 5-7 Regression output

6. Discussion

This thesis aimed to explore how ESG performance influences the financial performance of companies listed on the Euro Stoxx 50 index over the period 2022–2024. The findings give a mixed but interesting picture. While there is some support for the hypothesis that ESG efforts improve financial results the relationship depends heavily on which financial metric is used and how performance is measured.

ESG and Operational Profitability

The most clear result is the positive and significant relationship between ESG scores and EBIT. This suggests that firms with stronger ESG practices tend to be more profitable in their every day operations. This finding supports theories like Stakeholder Theory, which argues that companies that consider the interests of a wider group of stakeholders such as employees, communities and the environment can benefit from things like improved trust, a better reputation and stronger internal processes (Freeman, 1984). It is also in line with the idea of shared value (Porter & Kramer, 2011), which says that addressing social and environmental challenges can also lead to competitive advantages and economic gains. The positive link with EBIT also supports research by Whelan et al. (2021) and Eccles et al. (2014), who found that firms that focus on sustainability tend to outperform companies that do not in operational metrics. It is possible that ESG improves efficiency, reduces waste and helps attract and retain talented employees which is al beneficial to the core business results.

ESG and Accounting-Based Returns

On the other hand, the study did not find a significant relationship between ESG and ROE or ROA, even though the direction of the correlation was generally positive. This could mean that ESG investments are not directly or immediately reflected in how well a company uses its assets or equity to generate profit. It is also possible that short-term costs of implementing ESG strategies reduce these returns in the short run. But they will become worthwhile down the road. This is in line with findings from Elmarzouky et al. (2022), who also found mixed results when looking at ESG and financial performance. Their study, like this one, showed that ESG might hurt some financial ratios while improving others. The idea here is that ESG initiatives may take time to pay off and might not show immediate gains in efficiency metrics like ROA or returns to shareholders like ROE.

Also, it's worth noting that larger companies in the sample had higher ESG scores on average, but they also showed lower ROA and ROE. This might reflect the fact that bigger companies often have more complex structures, making it harder to stay efficient even if they perform well in ESG.

ESG and Market Valuation

Perhaps the most surprising result is the significant negative relationship between ESG scores and Tobin’s Q. This suggests that even though companies with high ESG scores may perform well operationally, the market does not necessarily reward them with a higher valuation. One explanation could be that investors are still cautious about ESG or see it as costly and not profitable in the short term. Some may believe that ESG is more of a compliance issue than a value driver. This finding could also again point to a timing issue. Because

ESG may improve operations today however, the market might need more time to fully recognize or understand these benefits. This interpretation matches what Bénabou and Tirole (2010) and Liang and Renneboog (2017). They suggest that ESG may not yet be priced by investors especially if its value is harder to quantify. Another reason could be information asymmetry. Some companies may engage in greenwashing by which they appear more sustainable than they actually are (Delmas & Burbano, 2011). If investors are unsure about how genuine ESG claims are, they may discount their value in pricing.

ESG: A Mixed but Evolving Story

Overall, the results suggest that ESG can help companies improve operational performance, but that improvement is not always recognized by the market or reflected in traditional accounting measures. The findings support that ESG performance is not one-size-fits-all. Its impact varies by sector, company size and the specific financial measure used.

From a practical standpoint, the results give investors a reason to look beyond short-term returns and consider the longer-term benefits of ESG. For managers, the link between ESG and EBIT is a reason to continue integrating ESG into their core strategies. However, the disconnect with Tobin's Q suggests that managers may need to communicate their ESG efforts more clearly to the market.

Finally, the results underline the need for better ESG reporting standards, especially to reduce greenwashing and help investors more accurately assess ESG-related risks and opportunities.

7. conclusion

The regression analysis provides insights into the relationships between financial performance metrics and key firm characteristics, particularly the market-to-book ratio, company size, leverage, and ESG Score. Across all models the market-to-book ratio was a strong and statistically significant predictor of firm performance. Whether evaluating ROE, ROA, EBIT or Tobin's Q, companies with higher market valuations relative to their book values tend to perform better both in terms of internal profitability and external market perception. This underscores the relevance of investor confidence and growth expectations as reflected in market valuation.

The role of the ESG Score varies notably across the financial performance metrics. While it has no statistically significant impact on ROE or ROA, it shows a positive and significant association with EBIT, indicating that better ESG performance may contribute to stronger operational profitability. This supports the logic of Stakeholder Theory (Freeman, 1984), which argues that companies that consider the needs of a broad group of stakeholders like employees and customers can benefit through improved efficiency and a better. it can also improve sustainability. ESG-oriented firms may therefore be better positioned to optimize their internal processes, leading to higher operating income.

However, the negative and statistically significant relationship between ESG Score and Tobin's Q introduces a paradox. Although ESG appears to strengthen operational performance, firms with higher ESG scores tend to

be valued lower by the market. One explanation can be drawn from Agency Theory (Jensen & Meckling, 1976), which suggests that investors may view ESG initiatives as managerial decisions that do not directly benefit shareholders especially when the financial returns are long-term or intangible. If ESG activities are not clearly linked to shareholder value, they may be perceived as agency costs, causing investors to discount the firm's valuation. This divergence highlights a tension between internal performance and external perception. While ESG practices may genuinely contribute to operational efficiency and long-term resilience, they are not always rewarded by the market. This underlines the importance for firms not only to engage in ESG efforts but also to communicate their strategic relevance effectively to investors, aligning sustainability with clear financial value.

In summary, the findings support the importance of market valuation indicators like the market-to-book ratio in understanding firm performance, while offering a nuanced view of how ESG performance interacts differently with internal profitability versus market valuation. Although ESG engagement appears to enhance operating income, it may not yet be fully appreciated by financial markets, pointing to an area for further research and long-term monitoring.

8. Limitations and implications

Limitations

While this study offers meaningful contributions to the ESG-performance debate, several limitations should be acknowledged.

Time Frame Constraints: The data covers a relatively short three-year period (2022–2024). ESG impacts may take longer to materialize, particularly for long-term strategic or sustainability-oriented initiatives. As such, the results may underestimate the true influence of ESG practices on financial outcomes over longer horizons.

Geographic and Index Scope: The study is limited to firms listed in the Euro Stoxx 50 index, which includes only the largest publicly traded European firms. This limits the generalizability of the findings to smaller firms, emerging markets, or non-European contexts where ESG practices and disclosure regulations may differ substantially.

Data Availability and Measurement: ESG scores were sourced from Refinitiv, a reputable but proprietary provider. While comprehensive, these scores are based on disclosed data and may suffer from inconsistency in reporting standards or potential greenwashing. Moreover, the aggregated ESG score does not account for sector-specific materiality, which may influence how ESG issues impact financial performance in different industries.

Potential Omitted Variable Bias: Although the model includes key control variables (size, leverage, market-to-book ratio, sector, and year), other important determinants of financial performance such as R&D intensity, market competition, or macroeconomic conditions are not included which can potentially give biased results.

Endogeneity Concerns: The study assumes a unidirectional influence from ESG performance to financial outcomes. However, it is plausible that better-performing firms may have more resources to invest in ESG initiatives, creating a potential reverse causality that is not accounted for in the current OLS model. We could add more variables and controls to counter this effect. This would however increase the scope and complexity of the study too much.

Implications for Practice and Research

The findings have several implications. For investors, understanding that ESG improves operating profitability but may not yet influence market valuation could inform more patient, long-term investment strategies. For managers, the positive relationship between ESG and EBIT encourages the continued integration of sustainable practices into core operations. Finally, policymakers might consider how to better align market incentives with ESG performance, possibly through enhanced disclosure standards or financial incentives. Future research could extend this work by exploring different time periods, sectors, or geographies, incorporating lagged effects, or applying instrumental variable techniques to better isolate causal relationships. Exploring disaggregated ESG scores or firm-level case studies may also help unpack the nuanced effects observed in this study.

9. AI usage

During the writing of this thesis AI tools such as ChatGPT have been used in a supportive role. The AI ChatGPT was used to refine or rephrase written parts, which I had wrote myself before, to increase clarity and lower the amount of grammar mistakes. When ChatGPT was used, I thoroughly reviewed and edited the content as needed, taking full responsibility for the outcome. All analyses and conclusions are the result of my own work and judgment.

10. references

Al Amosh, H., Khatib, S. F., & Ananzeh, H. (2023). Environmental, social and governance impact on financial performance: Evidence from the Levant countries. Corporate Governance: The International Journal of Business in Society, 23(3), 493–513.

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. Corporate Governance: The International Journal of Business in Society, 20(7), 1409–1428.

Atan, R., Alam, M. M., Said, J., & Zamri, M. (n.d.). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies.

Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. Journal of Memory and Language, 59(4), 390–412.

Bénabou, R., & Tirole, J. (2010). Individual and corporate social responsibility. Economica, 77(305), 1–19.

Carnini Pulino, S., Ciaburri, M., Magnanelli, B. S., & Nasta, L. (2022). Does ESG disclosure influence firm performance? Sustainability, 14(13), 7595. https://doi.org/10.3390/su14137595

Chatterji, A. K., Levine, D. I., & Toffel, M. W. (2016). Corporate social responsibility and access to finance. Strategic Management Journal, 37(6), 1175–1193. https://doi.org/10.1002/smj.2416

Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. Journal of Environmental Management, 345, 118829.

Clark, G. L., Feiner, A., & Viehs, M. (2015). From the stockholder to the stakeholder: How sustainability can drive financial outperformance. SSRN. https://doi.org/10.2139/ssrn.2508281

D'Amato, V., D'Ecclesia, R., & Levantesi, S. (2024). Firms' profitability and ESG score: A machine learning approach. Applied Stochastic Models in Business and Industry, 40(2), 243–261.

Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. California Management Review, 54(1), 64–87. https://doi.org/10.1525/cmr.2011.54.1.64

Demidenko, E. (2013). Mixed models: Theory and applications with R (2nd ed.). Wiley.

Drempetic, S., Klein, C., & Zwergel, B. (2020). The influence of firm size on the ESG score: Corporate sustainability ratings under review. Journal of Business Ethics, 167(2), 333–360.

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. Management Science, 60(11), 2835–2857.

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

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. Journal of Sustainable Finance & Investment, 5(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917

Gelman, A., & Hill, J. (2007). Data analysis using regression and multilevel/hierarchical models. Cambridge University Press.

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill.

Halid, S., Rahman, R. A., Mahmud, R., Mansor, N., & Wahab, R. A. (2023). A literature review on ESG score and its impact on firm performance. International Journal of Academic Research in Accounting, Finance and Management Sciences, 13(1), 272–282.

Hayes, A. (2021). Q ratio or Tobin's Q: Definition, formula, uses, and examples. Investopedia. https://www.investopedia.com/terms/q/qratio.asp

Hornuf, L., & Yüksel, G. (2023). The performance of socially responsible investments: A meta-analysis. European Financial Management, 30(2), 1012–1061. https://doi.org/10.1111/eufm.12439

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305–360.

Kaźmierczak, M. (2022). A literature review on the difference between CSR and ESG. Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska, (162).

Kenton, W. (2024). Durbin Watson test: What it is in statistics, with examples. Investopedia. https://www.investopedia.com/terms/d/durbinwatson-statistic.asp

Kim, S., & Li, Z. (2021). Understanding the impact of ESG practices in corporate finance. Sustainability, 13(7), 3746. https://doi.org/10.3390/su13073746

Makridou, G., Doumpos, M., & Lemonakis, C. (2024). Relationship between ESG and corporate financial performance in the energy sector: Empirical evidence from European companies. International Journal of Energy Sector Management, 18(4), 873–895.

Margolis, J. D., & Walsh, J. P. (2003). Misery loves companies: Rethinking social initiatives by business. Administrative Science Quarterly, 48(2), 268–305. https://doi.org/10.2307/3556659

Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2009). Does it pay to be good... and does it matter? A meta-analysis of the relationship between corporate social and financial performance. SSRN. https://doi.org/10.2139/ssrn.1866371

MSCI. (n.d.). The MSCI principles of sustainable investing. https://www.msci.com/documents/10199/16912162/The-MSCI-Principles-of-Sustainable-Investing.pdf

OECD. (2024). Global corporate sustainability report 2024. OECD Publishing. https://doi.org/10.1787/8416b635-en

Osborne, J. W., & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. Practical Assessment, Research, and Evaluation, 8(1).

Pinheiro, J., & Bates, D. (2000). Mixed-effects models in S and S-PLUS. Springer.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. Harvard Business Review, 89(1/2), 62–77.

Pulino, S. C., Ciaburri, M., Magnanelli, B. S., & Nasta, L. (2022). Does ESG disclosure influence firm performance? Sustainability, 14(13), 7595. https://doi.org/10.3390/su14137595

Rezaee, Z., Homayoun, S., Poursoleyman, E., & Rezaee, N. J. (2023). Comparative analysis of environmental, social, and governance disclosures. Global Finance Journal, 55, 100804. https://doi.org/10.1016/j.gfj.2022.100804

Rousseeuw, P. J., & Leroy, A. M. (1987). Robust regression and outlier detection. Wiley.

S&P Global. (2021). Essential sustainability intelligence. https://www.spglobal.com/esg/education/essential-sustainability/esg

Siew, R. Y. J. (2015). A review of corporate sustainability reporting tools (SRTs). Journal of Environmental Management, 164, 180–195. https://doi.org/10.1016/j.jenvman.2015.09.010

Tarighi, H., Appolloni, A., Shirzad, A., & Azad, A. (2022). Corporate social responsibility disclosure (CSRD) and financial distressed risk (FDR): Does institutional ownership matter? Sustainability, 14(2), 742.

Teng, X., Ge, Y., Wu, K. S., Chang, B. G., Kuo, L., & Zhang, X. (2022). Too little or too much? Exploring the inverted U-shaped nexus between voluntary environmental, social and governance and corporate financial performance. Frontiers in Environmental Science, 10, 969721.

Torelli, R., Balluchi, F., & Lazzini, A. (2020). Greenwashing and environmental communication: Effects on stakeholders' perceptions. Business Strategy and the Environment, 29(2), 407–421.

Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. Journal of Global Responsibility, 8(2), 169–178.

Whelan, T., Atz, U., & Clark, C. (2021). ESG and financial performance: Uncovering the relationship by aggregating evidence from 1,000 plus studies. https://sri360.com/wp-content/uploads/2022/10/NYU-RAM_ESG-Paper_2021-2.pdf

11. Appendix

overview of models

Model	DV	IV	Control Variables	Time Period	Expected relationship
1.1	EBIT	ESG Score	MV/BV, Size, Leverage	2022–2024	+
2.1	ROE	ESG Score	MV/BV, Size, Leverage	2022–2024	+
3.1	ROA	ESG Score	MV/BV, Size, Leverage	2022–2024	+
3.4	Tobin's Q	ESG Score	MV/BV, Size, Leverage	2022–2024	+

Table 11.1

Written out equations from chapter 4.2.1

(1.1) $EBIT_{it} = \beta 0 + \beta 1 ESGScore_{it} + \beta 2\ Market\ value\ to\ book\ ratio_{it} + \beta 3\ Firm\ size_{it} + \beta 4 financial\ leverage_{it} + error_{it}$

(2.1) $ROE_{it} = \beta 0 + \beta 1 ESGScore_{it} + \beta 2\ Market\ value\ to\ book\ ratio_{it} + \beta 3\ Firm\ size_{it} + \beta 4 financial\ leverage_{it} + error_{it}$

(3.1) $ROA_{it} = \beta 0 + \beta 1 ESGScore_{it} + \beta 2\ Market\ value\ to\ book\ ratio_{it} + \beta 3\ Firm\ size_{it} + \beta 4 financial\ leverage_{it} + error_{it}$

(4.1) $TobinsQit = \beta 0 + \beta 1 ESGScore_{it} + \beta 2\ Market\ value\ to\ book\ ratio_{it} + \beta 3\ Firm\ size_{it} + \beta 4 financial\ leverage_{it} + errorit$

In all equations:

i represents the individual firm,

t denotes the time period (years 2022–2024),

the error term accounting for unexplained variability.

company name	GICS	Recategorized
L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude SA	Industrials	Industry
AXA SA	Financials	Financial
BNP Paribas SA	Financials	Financial
EssilorLuxottica SA	Health Care	Healthcare
L'Oreal SA	Consumer Staples	Consumer Goods
LVMH Moet Hennessy Louis Vuitton SE	Consumer Discretionary	Consumer Goods
Vinci SA	Industrials	Industry
Schneider Electric SE	Industrials	Industry
TotalEnergies SE	Energy	Industry
Hermes International SCA	Consumer Discretionary	Consumer Goods
SAP SE	Information Technology	Technology
BASF SE	Materials	Industry
Deutsche Telekom AG	Communication Services	Technology
Allianz SE	Financials	Financial
Muenchener Rueckversicherungs-Gesellschaft in Muenchen AG	Financials	Financial
Intesa Sanpaolo SpA	Financials	Financial
UniCredit SpA	Financials	Financial
ASML Holding NV	Information Technology	Technology
Iberdrola SA	Utilities	Industry
Nestle SA	Consumer Staples	Consumer Goods
BP PLC	Energy	Industry
Diageo PLC	Consumer Staples	Consumer Goods
Rio Tinto PLC	Materials	Industry
RELX PLC	Industrials	Industry
AstraZeneca PLC	Health Care	Healthcare
British American Tobacco plc	Consumer Staples	Consumer Goods
Unilever PLC	Consumer Staples	Consumer Goods
HSBC Holdings PLC	Financials	Financial
Mercedes-Benz Group AG	Consumer Discretionary	Consumer Goods
Sanofi SA	Health Care	Healthcare
Banco Santander SA	Financials	Financial
Safran SA	Industrials	Industry
Siemens AG	Industrials	Industry
Enel SpA	Utilities	Industry
Airbus SE	Industrials	Industry
Zurich Insurance Group AG	Financials	Financial
GSK plc	Health Care	Healthcare
Anheuser-Busch Inbev SA	Consumer Staples	Consumer Goods

Novo Nordisk A/S	Health Care	Healthcare
Abb Ltd	Industrials	Industry
Novartis AG	Health Care	Healthcare
Roche Holding AG	Health Care	Healthcare
London Stock Exchange Group PLC	Financials	Financial
National Grid PLC	Utilities	Industry
Shell PLC	Energy	Industry
Compagnie Financiere Richemont SA	Consumer Discretionary	Consumer Goods
Glencore PLC	Materials	Industry
UBS Group AG	Financials	Financial
ING Groep NV	Financials	Financial
Prosus NV	Communication Services	Technology

Table 11-2 company list with groups

Original GICS Sector	Recategorized Group
Financials	Financial
Health Care	Healthcare
Industrials	Industry
Materials	Industry
Energy	Industry
Utilities	Industry
Consumer Staples	Consumer Goods
Consumer Discretionary	Consumer Goods
Information Technology	Technology
Communication Services	Technology

Table 11-3, recategorized groups

variable	explanation
Independent variable	
ESG score	Overall score of Environmental, Social and Governance scores given by Refinitiv
Dependent variables	
EBIT	EBIT=Revenue−Operating Expenses
ROE	ROE=Net Income/ Shareholders equity
ROA	ROA=Net Income/ Total Assets
Tobin's Q	Tobin's Q=Total Asset Value of Firm/ Total Market Value of Firm
Control variables	
Leverage	Total debt/ (Total assets – Total liabilities)
Market-to-book ratio	Market value/ (Total assets – Total liabilities)
Firm size	Natural logarithm of Total assets
Sector	GICS sectors
year	Which year the data was taken

Table 11-4 variable overview