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Does industry matter in terms of ESG? The impact of ESG on corporate financial performance – Evidence from Europe

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ABSTRACT:

In recent years, corporate social responsibility has increasingly gained significance within academic literature and the business world. Environmental, Social, and Governance (ESG) factors are progressively being integrated into the identification of risks and opportunities associated with business operations. The growing understanding of the importance of corporate social responsibility has led to an increase in related regulations, with ESG initiatives no longer being solely voluntary. The European Union is a forerunner in sustainability and has actively sought to enhance related regulations to ensure continued progress. A recent example of increased regulation in the EU is the Corporate Sustainability Reporting Directive (CSRD), which requires companies to report on sustainability-related practices as part of their annual reports.

While the impact of ESG on corporate financial performance (CFP) has been extensively studied, the industry-specific variations in European companies have not been equally addressed. This study aims to increase understanding of the effects of ESG performance on CFP by examining over 800 publicly listed companies operating in EU countries between 2012 and 2022. The objective is to determine whether the relationship between ESG and CFP varies across different industries. The financial performance is assessed using return on assets (ROA) and Tobin's Q, with panel regression employed as the research methodology.

The findings reveal that ESG asymmetrically affects CFP, depending on the performance metric used. The impact of ESG on ROA is positive, whereas its effect on Tobin's Q is negative. Furthermore, the results indicate that the relationship between ESG and financial performance is asymmetric across different industries. The findings suggest that the relationship between ESG and financial performance is more favorable in industries where ESG investments are clearly observable from the perspective of external stakeholders and in so-called ESG-sensitive industries. In contrast, the relationship between ESG investments and financial performance in non-sensitive industries is less favorable.

Since the results are asymmetric, they partly support the stakeholder and legitimacy theory perspectives, positing that ESG investments enhance corporate transparency and increase trust from stakeholders, thereby positively influencing financial performance. On the other hand, the results also partly support the shareholder theory and principal-agent theory, which suggest that ESG investments increase firm costs and are thus undertaken at the expense of shareholders.

KEYWORDS: ESG, Corporate Financial Performance, Industry Analysis

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TIIVISTELMÄ:

Yritysvastuullisuus on viimeisten vuosien aikana kasvattanut merkitystään niin akateemisessa kirjallisuudessa kuin yritysmaailmassa. Ympäristöön, yhteiskuntaan ja hyvään hallintotapaan (ESG) liittyvät teemat otetaan yhä useammin huomioon pyrittäessä tunnistamaan yritystoimintaan liittyviä riskejä ja mahdollisuuksia. Yritysvastuullisuuden merkityksen ymmärrys on myös lisännyt siihen liittyvää sääntelyä, eikä ESG-toimet perustu enää ainoastaan vapaaehtoiseen toimintaan. Euroopan Unioni on monessa suhteessa edelläkävijä vastuullisuuden edistämisessä, ja se onkin pyrkinyt lisäämään yritysvastuullisuuteen liittyvää sääntelyä suotuisan kehityksen varmistamiseksi. Tuore esimerkki sääntelyn lisääntymisestä EU:ssa on kestävyysraportointidirektiivi (CSRD), joka velvoittaa yrityksiä raportoimaan vastuullisuuteen liittyvistä teemoista osana vuosikertomusta.

Vaikka ESG:n vaikutuksia yritysten taloudelliseen suoriutumiseen on tutkittu laajasti, niin toimialakohtaisiin eroihin eurooppalaisiin yrityksiin kohdistuvassa tutkimuksessa ei ole kiinnitetty samalla tavalla huomiota. Tämä tutkimus pyrkii lisäämään ymmärrystä ESG-suoriutumisen vaikutuksista yritysten taloudelliseen suoriutumiseen tutkimalla yli 800 EU-maissa toimivaa listattua yritystä vuosien 2012–2022 aikana. Tutkimuksen tarkoitus on tunnistaa, vaihteleeko ESG:n ja taloudellisen suoriutumisen välinen yhteys eri toimialojen välillä. Yritysten taloudellista suoriutumista mitataan koko pääoman tuottoasteella (ROA) sekä Tobinin Q:lla, ja tutkimusmetodina käytetään paneeliregressiota.

Tutkimustulokset osoittavat, että ESG vaikuttaa epäsymmetrisesti yritysten taloudelliseen suoriutumiseen riippuen siitä, millä suoriutumista mitataan. Koko pääoman tuottoasteella mitattuna ESG:n vaikutus on positiivinen, kun taas Tobinin Q:lla mitattuna vaikutus on negatiivinen. Lisäksi tulokset osoittavat, että ESG:n ja taloudellisen suoriutumisen välinen suhde on epäsymmetrinen eri toimialojen välillä. Tutkimustulokset viittaavat siihen, että ESG:n ja taloudellisen suoriutumisen välinen suhde on suotuisampi toimialoilla, joilla ESG-panostukset ovat selkeästi havaittavissa ulkoisten sidosryhmien näkökulmasta, sekä niin sanotuilla ESG-herkillä toimialoilla. Sen sijaan ei-herkillä toimialoilla ESG-panostusten ja taloudellisen suoriutumisen välinen suhde on epäsuotuisampi.

Koska tulokset ovat epäsymmetrisiä, ne toisaalta tukevat sidosryhmä- ja legitimiteettiteorian mukaista näkemystä siitä, että ESG-panostukset lisäävät yritysten läpinäkyvyyttä ja parantavat sidosryhmiltä saatua luottamusta, mikä vaikuttaa positiivisesti yrityksen taloudelliseen suoriutumiseen. Toisaalta tulokset osittain tukevat myös osakkeenomistajien teoriaa sekä päämies-agentti-ongelmaa, joiden mukaan ESG-panostukset lisäävät yritysten kustannuksia, ja näin ollen ne saatetaan toisinaan tehdä osakkeenomistajien kustannuksella.

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1 Introduction

"The social responsibility of business is to increase its profits." The times have indeed changed, and in today´s business environment, the title of Milton Friedman´s widely known article from 1970 feels absurd. Unlike Friedman´s (1970) profit maximization theory argues, companies are no longer evaluated solely based on their financial performance or profit margins. Instead, they are expected to take responsibility for their impact on the environment and stakeholders rather than just shareholders. Since investors are increasingly conscious of companies´ social responsibility, many abstain from supporting unethical business practices, even if they are financially profitable. Furthermore, with increased regulation, many unethical actions are no longer only against common cultural norms, but also against the law.

In recent years, there has been an increasing recognition of the importance of environmental, social, and governance (ESG) factors on the firm performance and shareholder value. According to Epstein (2008), long-term competitive advantage can only be achieved if it is done in a socially and environmentally sustainable way. Moreover, Bassen et al. (2015) argue that every rational investor should consider ESG criteria in their investing decisions in order to meet their financial objectives. Because of the significant rise in ESG investments and widespread ESG reporting, ESG has developed as a vital topic in business literature.

Research has shown that ESG factors can significantly affect corporate financial performance (see, e.g., Lins et al., 2017; Albuquerque et al., 2018). However, some industries are more sensitive to ESG issues than others (see, e.g., Garcia et al., 2017; Bae et al., 2021). This category includes industries involved with emerging environmental, social, or ethical issues, such as oil, mining, and biotech, as well as industries often considered sinful, such as tobacco and gambling (Garcia et al., 2017). Different industries have also different ESG challenges. For example, the manufacturing sector struggles with environmental concerns, the consumer goods and services sector has a weaker social record,

whereas the banking sector has typically faced criticism regarding its corporate governance practices (Capelle-Blancard & Petit, 2014).

According to a survey of institutional investors conducted by Amel-Zadeh and Serafeim (2018), 82 % of the surveyed investors consider ESG information when making investment decisions, with the majority (63 %) doing so mainly due to financial rather than ethical motives. Based on the responses, it is observed that institutional investors consider ESG information as material for financial performance. However, what is considered material, varies systematically across different industries (Amel-Zadeh & Serafeim, 2018). Since different industries face distinct ESG-related challenges, it is meaningful to investigate how the impact of ESG performance on financial performance varies across different industries. Perhaps the most significant question is whether ESG holds equal importance for all industries.

1.1 Purpose of the study

The purpose of the study is to investigate the impact of environmental, social, and governance (ESG) scores on corporate financial performance (CFP). More specifically, the study investigates whether the impact is symmetric between different industries. The research sample includes publicly listed companies in the member states of the European Union for the period of 2012-2022. In line with previous literature, this study measures CFP by Tobin´s Q and return on assets (see, e.g., Albuquerque et al., 2018; Buchanan et al., 2018; Kristjanpoller et al., 2019). The ESG performance is measured by a combined score of environmental, social, and governance performance retrieved from Refinitiv.

Europe is a leader in many measures in considering ESG factors (Global Sustainable Investment Alliance, 2021; De Vincentiis, 2022). Amel-Zadeh and Serafeim (2018) find that European institutional investors consider ESG factors more frequently and with higher quality than their US counterparts. Furthermore, the European Union plays a significant

role in regulating companies´ ESG practices. A current example of the regulatory development is the Corporate Sustainability Reporting Directive (CSRD). Aligned with the European Green Deal, the CSRD intensifies regulations and broadens the scope of reporting requirements to include a wider range of companies. For these reasons, this study investigates companies operating in the European Union.

This study is motivated by the growing global emphasis on sustainability and responsible business practices, with the EU playing a crucial role as a pioneer in sustainability. ESG has long been recognized as a significant factor influencing companies' reputation, social impacts, and financial position. However, the importance of industries in this context has not received equal attention. According to Al Hawaj and Buallay (2022), the existing research on ESG in a cross-sectoral context is insufficient. It has been acknowledged that different industries face distinct ESG challenges and varying regulatory environments. Yet, the impact of ESG practices on a company's financial position across different industries remains predominantly unclear.

The following studies have examined sector-specific variations in the relationship between ESG and CFP. Humphrey et al. (2012) investigate the influence of industry on the relationship between ESG ratings and stock returns of UK companies. Similarly, Bae et al. (2021) investigate the correlation between ESG and stock market performance across various industries; however, their study sample is confined to U.S. companies. Gonçalves et al. (2018) and Chen et al. (2023) analyze the impact of environmental sensitivity of the industry on the relationship between ESG and CFP. While Gonçalves et al. (2018) concentrate on investigating companies in Brazil, Chen et al. (2023) employ a global research sample. Al Hawaj and Buallay (2022) examine the relationship between ESG and CFP across seven distinct industries, utilizing data from 80 different countries. However, the most prominently represented countries in their sample are China, the United States, and Japan. Consistent with Al Hawaj and Buallay (2022), Andersen and Bams (2022) utilize a large global sample in order to examine the relationship between environmental

performance and ROA in four industry categories. Most recently, Alfalih (2023) investigates the impact of ESG disclosure of US companies on ROA and Tobin's Q in two different industry groups.

Many of the studies mentioned above have primarily investigated the impact of ESG on stock market performance rather than concentrating on accounting-based metrics for corporate financial performance. Moreover, the mentioned studies have not concentrated on the examination of European companies. While the relationship between ESG and CFP has been extensively investigated in the context of European companies, these studies have not similarly focused on industry-specific differences. Hardeck et al. (2016) examine the effect of ESG on firm risk for European companies. Velte (2017) investigates how the ESG performance of German companies affects their profitability and market valuation. Furthermore, Boulhaga et al. (2022) investigate the impact of ESG performance on the financial performance of French companies, considering the moderating effect of internal control weaknesses. However, these studies have not analyzed how the relationship between ESG and CFP varies across different industries.

Consequently, the current body of research provides an opportunity to investigate the relationship between ESG and corporate financial performance across various industries, particularly concerning European companies. Hence, this thesis aims to contribute to the existing research by focusing on industry-specific variations in the relationship between ESG and CFP among companies based in European Union member states.

1.2   Research hypotheses

Previous research on ESG performance and corporate financial performance has found contradictory results. The majority of the existing research supports the hypothesis that ESG performance has a positive effect on corporate financial performance (see, e.g., El Ghoul et al., 2011; Lins et al., 2017; Gillan et al., 2021). The previous research has shown several reasons for how ESG has enhanced corporate financial performance. For example,

ESG can reduce the systematic risk of a company (Albuquerque et al., 2018; Gillan et al., 2021; Pástor et al., 2021), decrease cost of equity (Dhaliwal et al., 2011; El Ghoul et al., 2011), increase stock returns and firm value (Albuquerque et al., 2018), enhance operating efficiency (Brammer & Millington, 2005; Deng et al., 2013), and increase employee productivity (Fleischman & Valentine, 2008). Furthermore, it has been observed that companies with high corporate social responsibility survive significantly better during financial crises (Lins et al., 2017).

However, several studies find a negative relationship between ESG scores and firm performance (see, e.g., Garcia et al., 2007; Lioui & Sharma, 2012; Borghesi et al., 2014; Di Giuli & Kostovetsky, 2014). One proposed reason for the negative relationship is that ESG activities increase firm costs, resulting in an economic disadvantage. On the other hand, various studies do not find a statistically significant association between ESG scores and firm performance (see, e.g., McWilliams & Siegel, 2000; Ariño et al., 2010; Humphrey et al., 2012). McWilliams and Siegel (2000) argue that once firm-specific R&D investments are included in the equation, corporate social responsibility no longer affects corporate financial performance.

The existing research on ESG and CFP has provided conflicting results. However, the research supporting a positive correlation is significantly broader and more diverse than research favoring a negative relationship. This indicates that existing studies lean more towards the hypothesis that ESG has a positive impact on CFP. Thus, the first two hypotheses are set as follows:

H_1: ESG score has a positive impact on return on assets in European companies.

H_2: ESG score has a positive impact on Tobin's Q in European companies.

While the relationship between ESG and CFP is extensively studied, the research on variations between different industries has not received similar attention among researchers. However, there is some research on the topic, with the majority supporting the hypothesis that the relationship between ESG and CFP is not symmetrical across different industries (see, e.g., Gonçalves et al., 2018; Bae et al., 2021; Al Hawaj & Buallay, 2022; Andersen & Bams, 2022; Chen et al., 2023). Andersen and Bams (2022) highlight an asymmetry in the relationship between ESG and CFP across different industries. They find that industries classified under the "industrials" category exhibit a significant negative correlation between environmental performance and ROA. In contrast, the "competitive" industry group, which includes sectors related to food, health, and household goods, shows a significant positive correlation between environmental performance and ROA. Their results suggest that transitioning to environmental sustainability is costly for industrial firms, which are subject to high capital expenditures. Additionally, given the industry group's distance from consumers, ESG does not have the same positive effect on profitability as it does in the consumer-centric "competitive" sector. Among the literature reviewed in this study, only Humphrey et al. (2012) do not find any significant asymmetries in the ESG-CFP relationship among different industries. Thus, based on the existing literature, the third hypothesis is set:

H_3: The relationship between ESG and CFP is asymmetric between different industries.

The sensitivity of ESG issues of the industry may influence the relationship between ESG and corporate financial performance. Gonçalves et al. (2018) observe that for Brazilian companies, industries classified as environmentally sensitive, such as utilities, materials, and energy sectors, exhibit a stronger market value creating effect of ESG than non-sensitive industries. Furthermore, a study by Chen et al. (2023) conducted on a global sample indicates that ESG has a stronger positive impact on a company's profitability in environmentally sensitive industries compared to non-sensitive industries. Gonçalves et al. (2018) propose that a potential explanation for the stronger positive relationship between ESG and CFP in environmentally sensitive industries is that stakeholders reward

ESG initiatives more significantly when they are perceived as critical and essential. Conversely, investments in ESG improvements within non-sensitive industries may not be perceived as equally essential by stakeholders, thereby potentially diminishing their positive impact on CFP (Gonçalves et al., 2018). Based on the previous research, the fourth hypothesis is set as follows:

H_4: The value creating effect of ESG is stronger in ESG-sensitive industries.

1.3 Structure of the study

The thesis is structured into seven primary chapters, covering the theory, previous literature, and empirical part of the study. The study begins with an introduction to the topic, which includes a discussion of the purpose of the study and hypothesis development. Chapter two introduces the concept and terminology of sustainable investing and environmental, social, and governance (ESG) criteria. In the third chapter, the theoretical framework is introduced, focusing on shareholder theory, principal-agent theory, stakeholder theory, and legitimacy theory. Chapter four is a literature review of the existing research on ESG and corporate financial performance as well as the industry-specific effects on the relationship. From the fifth chapter onward, the empirical implementation is introduced. The chapter presents the data, variables, and methodology used in the analysis. Chapter six analyses the results of the study and their positioning with the existing literature. Finally, chapter seven discusses the main findings, limitations of the study, as well as recommendations for future research.

2 Sustainable investing

In March 2023, the Intergovernmental Panel on Climate Change (IPCC) released the Synthesis Report of the Sixth Assessment Report, which summarizes the latest research on climate change. The message of the report is severe. According to the report, greenhouse gas emissions caused by human activity have led to a 1,1°C rise in global average temperature from 1850-1900 to 2011-2020. Furthermore, the 1,5°C temperature increase is expected to occur by the early 2030 (IPCC, 2023). ICPP (2023) warns that the current climate actions are insufficient, meaning that rapid and substantial reductions in greenhouse gas emissions are required across all sectors within this decade.

The latest studies send a clear message: Actions must be taken immediately. In addition to environmental challenges, there has been an increasing recognition of social and governance issues. Investors are more aware of environmental and ethical challenges than ever, and they are ready to demand more sustainable business from the companies. Undoubtedly, terms such as Sustainability, ESG, and Corporate Social Responsibility are the prevailing megatrends even in the traditionally "hard" financial field. Global Sustainable Investment Alliance (2021) reported that at the start of 2020 global sustainable investments account for 35,9% of total assets. Europe plays the biggest role in sustainable investing. According to de Vincentiis (2022), almost 49% of total assets under management in Europe are sustainable investments.

The growing interest in ESG and Corporate Social Responsibility (CSR) is also reflected from the corporate perspective in an increase in sustainability reporting. According to Gillan et al. (2021), 86% of S&P 500 companies issued sustainability or corporate responsibility reports in 2018, in contrast to only 20% in 2011. Unlike in Europe, sustainability reporting in the U.S. is primarily voluntary. However, the motivation for companies to provide sustainability reports often comes from investors' pressure, urging them to be more transparent about their ESG practices.

Across the world, various regions and institutions are actively addressing environmental and social concerns through the establishment of unions and regulations. One of the most famous unions is the United Nations Framework Convention on Climate Change (UNFCCC). The union´s significant outcome is the Paris Agreement 2015, the objective of which is to limit the global average temperature rise to 1,5°C within this century. To meet this objective, greenhouse gas emissions must decrease by 43% by the year 2030 (UNFCCC, 2023).

In 2020, the largest asset management firm in the world, BlackRock Inc., announced in its annual letter to clients that sustainability should be the new standard for investing. According to the Global Sustainable Investment Alliance (2021), sustainable investing involves the incorporation of environmental, social, and governance criteria to achieve both competitive financial returns and positive societal impact. The term is typically used to encompass other related terms such as Corporate Social Responsibility (CSR), Socially Responsible Investing (SRI), and ESG investing (Starks, 2023). According to Starks (2023), the distinctions between these terms or even their specific definitions are not well-defined. However, all the sustainable investing approaches involve the exclusion of companies/industries that contradict ESG principles and the inclusion of companies/industries that represent sustainable characteristics. For clarity, this thesis mainly focuses on ESG, and a more comprehensive discussion of other sustainability-related terminology is not pursued, even though closely related.

2.1 ESG

Environmental, social, and governance is a framework that evaluates the sustainability and ethical practices of companies. The environmental aspect focuses on how companies address their impact on the environment. This includes considering their efforts to mitigate climate change, save resources, and adopt sustainable practices. The social aspect evaluates how companies manage their relationship with various stakeholders, including employees, customers, suppliers, and local communities. This means evaluating

factors such as labor rights, diversity and equality, customer satisfaction, and community engagement. The governance aspect focuses on the structures and processes that govern a company´s operations and decision-making. It covers factors such as board structure and independence, shareholder rights, executive compensation transparency, and ethical conduct.

In Europe, the European Union plays a major role in ESG regulation. For example, since the Non-Financial Reporting Directive (NFRD) became effective in 2017, the EU has required large and listed companies to report their ESG risks, as well as the effects of their operations on society and the environment (European Commission, 2022). In 2019, the European Commission introduced the European Green Deal, which is a strategy to transition the EU into a modern and resource-efficient economy. The goal of the European Green Deal is a climate-neutral Europe by 2050, with no net emissions of greenhouse gases, while disconnecting economic growth from resource use (European Commission, 2019).

In January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force, replacing the NFRD (European Commission, 2022). CSRD is part of the European Green Deal, and it strengthened the regulations and expanded the scope of reporting requirements to include a broader range of companies. Whereas NFRD impacted approximately 12,000 companies, CSRD impacts approximately 50,000 companies (European Commission, 2022). According to the report of the European Commission (2022), the purpose of the new rules is to ensure that investors and other stakeholders have access to the necessary information in order to evaluate investment risks associated with ESG issues. The first application of the directive is in the 2024 fiscal year when companies subject to the CSRD will be required to follow European Sustainability Reporting Standards (ESRS) and undergo sustainability audits (European Commission, 2022). Despite the EU's ESG regulation, there are significant disparities in the ESG performance among its member states. Agoraki et al. (2023) assessed the ESG reputational risk of EU member

states between 2007 and 2021. The results of their study show that the weakest performer in the EU, Bulgaria, had over three times higher ESG reputational risk compared to the best performer, Finland.

ESG ratings (ESG scores), offered by specialized rating institutions, hold significant influence in the decision-making process for investors who prioritize social responsibility. The providers use a variety of methodologies and criteria to measure the ESG performance of companies. However, ESG ratings lack standardized criteria, making direct comparisons between different providers complex (European Commission, 2023). Thus, the accuracy of ESG ratings has been under critical discussion. Several studies reveal significant disparities in ESG ratings provided by various sources (see, e.g., Bae et al., 2021; Avramov et al., 2022; Berg et al., 2022). For example, Bae et al. (2021) find that the ESG ratings provided by MSCI and Refinitiv show a correlation of only 0,38, indicating a significant disagreement between the two rating agencies. Furthermore, Kristjanpoller et al., (2019) argue that the ESG score does not provide a true reflection of a company's performance from a sustainability perspective. They suggest that ESG reflects more on a company's transparency than its actual ESG performance.

In June 2023, the European Commission published a proposal for regulation, which aims to ensure the transparency and reliability of ESG ratings. According to the proposal, the new regulation would require ESG rating providers in the EU to obtain authorization from the European Securities and Markets Authority (ESMA).

2.2 ESG and industry-specific effects

Considering ESG factors is a significant process in companies´ operations. However, the process is not straightforward as it involves considering various aspects depending on the industry in which the company operates. The existing literature has identified certain ESG-sensitive industries. These industries are typically characterized by more pronounced environmental or social challenges, political pressure, moral debates, or health

issues (Garcia et al., 2017). This category typically includes industries often considered controversial or extreme, such as tobacco, gambling, and weapons, as described by Garcia et al. (2017). However, in some contexts, industries with less clear contention are also included in the category. These industries include, for example, transportation, nuclear power, biotech, oil, and mining companies (Hennigs & Kilian, 2014). Gonçalves et al. (2018) define industries related to energy, materials, or utilities as environmentally sensitive because these sectors typically face more stringent environmental restrictions and requirements. The characterization of these industries is more complicated, and both the public and scholars tend to view them with less severity. For example, the adverse environmental impacts of the transportation sector are well recognized, yet the industry remains crucial for society.

Hennigs and Kilian (2014) also identify certain industries as non-ESG-sensitive or low-controversial. This category includes industries such as consumer goods, telecommunication, media and entertainment, and financial services (Hennigs & Kilian, 2014). This division is not straightforward either. For instance, the consumer goods sector includes certain companies manufacturing products in environmentally unsustainable ways, utilizing child labor, or conducting animal testing for the production and testing of their products. On the other hand, there are highly responsible companies within the industry that prioritize both environmental sustainability and social aspects. For this reason, categorizing sectors as either ESG-sensitive or non-sensitive can be challenging.

According to Borghesi et al. (2014), companies operating in consumer goods, technology, and financial services typically exhibit above-average ESG metrics. Conversely, businesses in the transportation services, chemicals, and energy sectors tend to exhibit below-average ESG metrics. This finding indicates that those industries considered to be non-sensitive, as proposed by Hennigs and Kilian (2014), possess better ESG metrics compared to ESG-sensitive industries. In contrast, Garcia et al. (2017) show that firms operating in ESG-sensitive industries exhibit superior environmental performance in the BRICS countries. The results are robust even after controlling for the company´s size and

geographical location (Garcia et al., 2017). Furthermore, they find that ESG-sensitive companies tend to have a higher likelihood of disclosing their environmental performance.

Similarly, Humphrey et al. (2012) find that ESG-sensitive industries have above-average ESG ratings. According to Humphrey et al. (2012), the seemingly unexpected high ESG scores in utilities, basic resources, and oil and gas reflect the significant social and regulatory pressure these sectors face. They suggest that this pressure forces them to invest resources in initiatives related to environmental, social, and governance aspects. These findings align with research on corporate legitimacy, indicating that companies in sensitive industries tend to disclose their ESG performance to safeguard their reputation (see, e.g., Palazzo & Scherer, 2006). Legitimacy theory suggests that companies can only survive if they are perceived as acceptable, thereby gaining support and resources from the stakeholders (Agle et al., 1997).

Because of the varying relevance of certain ESG issues in different industries, companies respond diversely to these challenges. Brammer and Millington (2005) explore the connection between philanthropic expenditure and corporate reputation. Their research reveals that philanthropy has a more positive impact on corporate reputation in socially harmful industries compared to other sectors. Interestingly, they show that this positive effect is absent in environmentally sensitive industries. Brammer and Millington (2005) propose that this asymmetrical impact arises because stakeholders perceive philanthropy as unrelated to environmental performance. The finding aligns with the legitimacy theory, suggesting that addressing reputational damage through compensatory actions can result in reputation mitigation for the company.

3 Theoretical framework

The purpose of this chapter is to provide an overview of the foundational theories underpinning ESG considerations and their relationship with corporate financial performance. First, there is an introduction of two competing theories: Shareholder theory and Stakeholder theory. These theories offer divergent perspectives on the fundamental purpose of a company and its obligations to various stakeholders. Shareholder theory aligns with conservative financial theory, asserting that the primary objective of a company is the maximization of shareholder wealth. In contrast, stakeholder theory emphasizes corporate social responsibility and sustainability, asserting that a company´s obligations extend beyond shareholders to encompass a broader spectrum of stakeholders. Additionally, this chapter discusses principal-agent theory, which examines the conflict of interests between shareholders and management from the perspective of ESG practices. Finally, legitimacy theory is introduced, which is based on the idea that businesses must maintain societal acceptance in order to achieve long-term success.

3.1 Shareholder theory

The shareholder theory, advocated predominantly by Friedman (1962), asserts that the primary societal obligation of a company is the maximization of profits within the framework of free-market competition. According to this perspective, businesses are entrusted with resources by shareholders, and their fundamental purpose is to utilize these resources to enhance shareholders' wealth. That is, a company should engage in projects with a positive net present value (Friedman, 1962).

Friedman (1962) emphasizes a clear distinction between corporate responsibility and social responsibility. According to the theory, companies should only participate in social responsibility projects that yield positive net present value. Financially unprofitable social welfare initiatives, on the other hand, conflict with the fundamental principle of the

company and the interests of its shareholders (Friedman, 1962). Corporate social initiatives, such as the establishment of minimum wages or price controls, are argued to disrupt the natural market order, potentially leading to product shortages and market imbalances. Friedman (1962) assumes that a company does not have a comparative advantage in socially responsible activities. According to this view, funds allocated to a socially responsible activity by a company hold the same value as funds allocated by any other entity. Therefore, it is also in the stakeholders' long-term interest that the company focuses on maximizing shareholder returns (Friedman, 1962). The claim is supported by the assumption that such a strategy ensures a surplus of funds remaining within the company available for distribution as dividends to shareholders. These shareholders have the autonomy to allocate these resources towards responsible initiatives in accordance with their own values (Friedman, 1962).

Friedman's (1962) well-known theory has received both significant support and criticism. Brown et al. (2006) support the shareholder theory by arguing that corporate responsibility actions are often made at the expense of shareholders. They further suggest that these programs often serve managers' and directors' personal interests resulting in agency costs. Similarly, Borghesi et al. (2014) find that a considerable number of ESG investments do not align with the interests of shareholders. Instead, these investments appear to be driven by the personal gain of company managers (Borghesi et al., 2014). They argue that managers seeking positive attention may engage in socially responsible investments even if they do not enhance the value of the company. Interestingly, the findings show that companies with significant institutional ownership, which typically prioritize shareholder interests, are less likely to engage in ESG initiatives (Borghesi et al., 2014). This finding indicates, consistent with Friedman's (1962) theory, that ESG/CSR initiatives do not align with shareholder interests. Shareholder theory has received widespread support in academic literature. A major factor contributing to its popularity is the concept of agency cost. The concept is further discussed in chapter 3.2.

Friedman (1962) strongly criticizes the concept of corporate social responsibility, characterizing it as a trajectory toward socialism and a challenge to the foundational principles of free markets. From this viewpoint, corporate executives should concentrate exclusively on profit-generating activities, safeguarding shareholders' investments and preserving the company's economic viability. According to shareholder theory, investing in ESG is only spending a company's resources (Friedman, 1962). However, several scholars advocating for the stakeholder theory argue that the situation is, in fact, the opposite. According to Deng et al. (2013), corporate social responsibility enhances a firm reputation, resulting in superior long-term operating performance and stock returns. They argue that a favorable relationship with stakeholders is a significant competitive advantage. Thus, it aligns also with the shareholders' interest in engaging in CSR activities (Deng et al., 2013).

3.2   Principal-Agent theory

According to the shareholder theory, the fundamental purpose of the firm is to maximize shareholder wealth. This theory suggests that company executives should always make decisions that increase the market value of the firm. However, the executive's pursuit of personal utility can lead to a conflict with the owner's interests. Such a situation gives rise to a principal-agent problem. Principal-agent theory by Jensen and Meckling (1976) describes the situation where an individual or entity, referred to as the "agent", represents another individual or entity, identified as the "principal". The principal-agent problem involves the uncertainty about whether the agent will consistently act in the best interests of the principal (Jensen & Meckling, 1976). In other words, principal-agent theory relates to a situation where the management is responsible for decision-making, while the shareholders bear the risk (Huang, 2021).

According to Ferrell et al. (2016), prior research has occasionally interpreted ESG/CSR practices as consequences of principal-agent problems. Pagano and Volpin (2005) show that managers who hold limited equity stakes have an incentive to pay high wages to

employees to secure their favor within the company´s leadership. However, this leads to agency costs as shareholders predominantly bear the expenses arising from this employment policy (Pagano & Volpin, 2005). According to Andersen and Bams (2022), managers over-invest in ESG to satisfy stakeholders who, however, lack a full understanding of the firm's strategic objectives and ways to achieve potential competitive advantage. Barnea and Rubin (2010) also emphasize the potential conflict of interest that emerges when managers excessively invest in ESG activities to improve their personal reputations. This phenomenon, known as the "halo effect", allows them to avoid adverse attention arising from within the company, such as discontented employees, or from external sources, such as unwelcome media coverage.

In contrast to Pagano and Volpin (2005) and Barnea and Rubin (2010), Ferrell et al. (2016) find evidence that socially responsible companies suffer less with agency problems. The study finds no evidence that CSR contributes to indicators related to agency problems, such as an excess of cash or a weak correlation between executive compensation and corporate financial performance. Instead, the findings of Ferrell et al. (2016) indicate that companies with higher CSR performance appear to be closely linked to more stringent cash constraints, reflecting disciplined managerial practices aligned with traditional corporate finance principles. Moreover, CSR demonstrates a positive connection with legal protections safeguarding shareholder rights, while exhibiting a negative connection with instances of controlling shareholders taking advantage of minority shareholders.

Consistent with Ferrell et al. (2016), Huang (2021) suggests that ESG mitigates principal-agent problems. He argues that ESG reduces the information asymmetry between the principal and the agent. According to Huang (2021), information asymmetry relates to a situation where the informational advantage held by management regarding organizational performance creates the risk of adverse selection. In such cases, management may choose to leave part of the information uncommunicated or hide the true nature of the activity. This situation also gives rise to moral hazard, where management might over-

spend without bearing the marginal cost of those expenditures (Huang, 2021). ESG practices and disclosure are associated with increased transparency, which reduces the adverse selection resulting in the information asymmetry between management and shareholders. However, Huang (2021) emphasizes that the impact of ESG on reducing moral hazard is uncertain because management might engage in extensive ESG activities at shareholders' cost.

According to Di Giuli and Kostovetsky (2014), the political orientation of a company's directors and CEOs is linked to the company's choices in ESG/CSR initiatives. Their research findings indicate that U.S. companies led by CEOs who contribute more significant donations to Democratic candidates tend to exhibit higher ESG/CSR scores. According to the results, a shift towards the political left by four standard deviations is correlated with a 0,4 standard deviation increase in the ESG/CSR score. This may lead to significant principal-agent conflicts if the political orientation of the company's management differs from that of the company's shareholders.

3.3 Stakeholder theory

Stakeholder theory expands a company's responsibilities beyond shareholders to encompass all stakeholders involved in the company's activities. This framework detailed by Freeman (1984) recognizes that businesses are interconnected with a diverse range of stakeholders, including customers, employees, suppliers, and the environment. According to the theory, a company should create value for all stakeholders, not just shareholders. Freeman (1984) suggests that stakeholders provide resources for companies with the expectation that their interests will be acknowledged and addressed in return. Stakeholder theory suggests that a company can create long-term value only if it strives to promote the interests of all stakeholders.

Stakeholder theory is recognized as the primary framework that influences the motivations driving a firm's ESG and CSR practices (Huang, 2021). According to stakeholder theory, engaging in ESG/CSR initiatives positively impacts shareholder wealth. This is because prioritizing the concerns of various stakeholders enhances their support for the company, ultimately leading to an increase in shareholder wealth (Deng et al., 2013). According to Garcia et al. (2017), a company should strive for maximum transparency by disclosing not only financial information but also non-financial information. These measures help prevent information asymmetry and enhance investor confidence (Garcia et al., 2017).

The results of the study conducted by Flammer (2013) supports the argument of shareholder theory that ESG/CSR positively affects shareholder wealth. Flammer (2013) finds that the stock market reacts positively to the news of companies' environmentally responsible actions, and conversely, negatively to environmentally harmful news. Furthermore, Flammer's (2013) findings indicate that over time, investors' positive reaction to responsible news diminishes, and conversely, their reaction to irresponsible news intensifies. He suggests that this trend is linked to the increasing establishment of corporate social responsibility as a norm, leading to reduced rewards for companies adhering to it. Instead, breaking the norm is increasingly punished over time (Flammer, 2013).

Despite the increasing significance of ESG/CSR investment for companies, there is an ongoing debate about the motives behind managers' engagement in these activities. Specifically, the discussion revolves around whether managers invest in ESG/CSR to enhance shareholder wealth or to prioritize stakeholders, even if it comes at the expense of shareholders (Deng et al., 2013). This debate is further complicated by the varied evidence concerning the relationship between ESG/CSR performance and firm performance.

3.4 Legitimacy theory

The main idea behind legitimacy theory is that organizations seek to maintain or enhance their legitimacy in the eyes of key stakeholders, such as the public, customers, investors, and regulators. Suchman (1995) describes legitimacy as the perceived right of an organization to operate within society's norms and values. The theory suggests that organizations are motivated to engage in ESG/CSR activities not only because they may bring direct financial benefits but also because they help the organization maintain its social license to operate. In other words, by behaving in a socially responsible and sustainable manner, companies aim to align themselves with societal expectations and values, thereby gaining and maintaining the approval and support of their stakeholders (Palazzo & Scherer, 2006).

The link between legitimacy theory and ESG/CSR lies in the understanding that organizations are under pressure to demonstrate their commitment to social and environmental concerns (Palazzo & Scherer, 2006). As societal expectations evolve, there is an increasing demand for businesses to go beyond mere profit-making and contribute positively to the well-being of the environment and communities in which they operate. Palazzo and Scherer (2006) argue that companies often engage in CSR initiatives and adopt ESG practices to signal their commitment to broader social and environmental goals. According to Kristjanpoller et al. (2019), ESG score is a good indicator of a company's transparency and, therefore, a good indicator of how much the company strives for legitimacy. They also suggest that larger companies, which have more assets at risk, have a greater incentive to strive for legitimacy. This, in turn, indicates that larger companies would disclose more ESG information.

According to Bae et al. (2021), legitimacy theory suggests that ESG/CSR initiatives are valuable only when they authentically align with stakeholder demands and environmental needs, rather than being perceived as greenwashing attempts. Garcia et al. (2017) suggest that firms with high legitimacy have lower unsystematic risk, as they have more favorable access to capital compared to those lacking legitimacy.

4 Prior research on ESG and corporate financial performance

The relationship between ESG and corporate financial performance (CFP) is extensively studied, yet it remains a topic of ongoing research. However, research has presented conflicting results, and thus the impact of ESG on CFP is not straightforward. Several scholars suggest that ESG factors tend to enhance firm valuation and reduce systematic risk (see, e.g., El Ghoul et al., 2011; Albuquerque et al., 2018; Gillan et al., 2021) In contrast, it has been also suggested that ESG has a negative impact on CFP (see, e.g., Garcia et al., 2007; Lioui & Sharma, 2012; Di Giuli & Kostovetsky, 2014). Furthermore, several studies indicate that the relationship between ESG and CFP is neutral (see, e.g., McWilliams & Siegel, 2000; Ariño et al., 2010; Humphrey et al., 2012) or the results are mixed (Buchanan et al., 2018). This chapter reviews previous studies on the effects of ESG on CFP and the impact of different industries on the relationship. In many studies, ESG and corporate social responsibility (CSR) are discussed as synonyms. Moreover, Starks (2023) argues that the terms ESG and CSR are frequently used interchangeably, and their meanings largely overlap. For that reason, this chapter also covers research on CSR and CFP.

4.1 Positive impact

El Ghoul et al. (2011) examine the impact of CSR on the cost of equity by examining 2,809 firms during 1992-2007. The study uses CSR scores provided by Kinder, Lydenberg, and Domini (KLD). Employing pooled cross-sectional time-series regressions, El Ghoul et al. (2011) find that high CSR performance is related to lower cost of equity. According to the study, the mean equity risk premium of firms with high CSR scores is 4,54%, whereas for firms with low CSR scores, it is 5,10%. El Ghoul et al. (2011) suggest that companies with a commitment to ethical practices generally face lower risks due to their ability to attract a wider range of investors. Furthermore, they suggest that irresponsible firms have a higher level of risk of facing uncertain future claims. Consistent with El Ghoul et al. (2011), Dhaliwal et al. (2011) show that voluntary disclosure of CSR factors results in a 1,77%

decrease in the future cost of equity. As expected, they find that firms that engage in voluntary CSR disclosure tend to have superior CSR performance. Additionally, the results indicate that firms engaging in voluntary CSR disclosure attract dedicated institutional investors characterized by long investment horizons.

Gao and Zhang (2015) demonstrate a positive impact of ESG on firm value, as measured by Tobin's Q. Employing Two-Stage Least Squares (2SLS) regression, they estimate this relationship for companies listed in Fortune Magazine's compilation of America's Most Admired Companies during 1993-2010. Consistent with Gao and Zhang (2015), Ferrell et al. (2016) show that the relationship between CSR and Tobin's Q is positive and significant. They use a sample of over 4,700 companies from 60 countries during the period of 2002-2013. Velte (2017) observes that ESG has no significant effect on Tobin's Q, whereas it has a positive and statistically significant impact on ROA. Utilizing multivariate regression analysis to examine the results for a sample of German companies from 2010 to 2014, he reports an increase of 4,9% in ROA for a one standard deviation rise in ESG score.

ESG can influence various risk types, such as systematic risk, reputational risk, regulatory risk, and supply chain risk (Gillan et al., 2021). It has been suggested that firms with stronger ESG performance may experience lower systematic risk exposures because of their enhanced resilience during crisis periods (Gillan et al., 2021). Consistent with the resiliency theory, Lins et al. (2017) find evidence that firms with strong ESG performance outperform firms with lower ESG performance during the financial crisis of 2008-2009. They investigate the relation between ESG and CFP of 1,673 companies using ESG scores provided by MSCI. Using difference-in-difference model, they find that firms with elevated ESG scores earn stock returns 4-7% greater than their counterparts with lower ESG scores.

Albuquerque et al. (2018) examine 28,578 U.S. firm-year observations during the period 2003-2015, utilizing CSR scores from MSCI. Their research shows that companies with

strong CSR practices tend to have a higher firm valuation, as indicated by a higher Tobin´s Q ratio. The impact of one standard deviation increase in CSR is substantial, leading to a 5% increase in Tobin' Q compared to the average value (Albuquerque et al., 2018). In addition, Albuquerque et al. (2018) suggest that high CSR firms have more loyal customers, which increases the firm's pricing power. Furthermore, their research reveals that companies with high CSR scores exhibit lower systematic risk. According to the findings, one standard deviation increase in the CSR score results in a 1% reduction in the firm's beta compared to the sample mean. Consequently, lower systematic risk results in a lower cost of equity. The results are consistent with El Ghoul et al. (2011), whose research finds evidence that companies with better CSR performance benefit from reduced costs of equity financing.

In line with Gao and Zhang (2015), Velte (2017), and Albuquerque et al. (2018), Kristjanpoller et al. (2019) examine the impact of ESG on CFP, as measured by Tobin's Q and ROA. Their sample consists of 467 firms included in the S&P 500 during the period of 2009-2015. Using OLS regression model, they observe a positive impact of ESG both on Tobin's Q and ROA. The results of the study indicate that the impact of ESG factors on Tobin's Q is stronger among large companies, as indicated by their sales, whereas the effects of ESG on ROA are most prominent for smaller firms, as indicated by market capitalization. In addition, Boulhaga et al. (2022) examine how ESG performance affect CFP, as assessed by Tobin's Q. Furthermore, they examine the effect of internal control weaknesses (ICWs) on the relationship. They use a sample of 98 French companies during 7-year period between 2012-2018. They assess ESG performance using ESG scores from Refinitiv. Using OLS regression analysis, they show a significant positive relationship between ESG performance and Tobin's Q. They observe that ICWs have a significant impact on the ESG-CFP relationship. However, they demonstrate that even after accounting for the effects of ICWs in the regression, the influence of ESG performance on a company's financial performance remains positive and statistically significant.

In addition to direct effects, ESG/CSR has also been found to have indirect effects on CFP. The results of the study of Borhesi et al. (2014) indicate that investing in ESG/CSR initiatives can help the company in attracting and retaining highly talented employees, as well as building stronger connections with customers. These factors indirectly but positively affect the value of the company (Borghesi et al., 2014). In addition, Deng et al. (2013) show that adopting ESG/CSR enhances a company's reputation, consequently leading to improvements in long-term operational performance. They emphasize that maintaining favorable relationships with stakeholders represents a crucial competitive advantage.

4.2 Negative impact

Garcia et al. (2007) investigate the relationship between CSR and CFP among 110 European companies during the period of 1998-2004. Their sample consists of 55 companies listed in the Dow Jones Sustainability Index (DJSI) and an additional 55 companies listed in the Dow Jones Global Index (DJGI) but excluded from the DJSI. They measure CFP with accounting ratios instead of market ratios as they suggest that accounting data offers a more stable depiction of the firm's actual performance by minimizing the influence of external market fluctuations. They focus on examining the growth in profit before tax and growth in revenue while also including other variables, such as profit margin and return on assets in their analysis. The findings indicate that CSR affects negatively the CFP variables, such as growth in profit before tax, return on equity, and return on assets in the short term. However, the study does not find disparities between the revenues of the DJSI and DJGI companies. Garcia et al. (2007) argue that the differences in growth in profit before tax are driven by the higher costs of the DJSI companies. However, they emphasize that the negative impact is not robust over time, indicating that the negative effect diminishes over time. This indicates that the costs related to CSR, such as employee well-being, safety, and product development outweigh their benefits in the short term.

Lioui and Sharma (2012) examine the impact of environmental CSR on CFP, as measured by ROA and Tobin's Q, employing fixed effects model. Utilizing a large sample consisting of over 17 000 firm-year observations during 1991-2007, they find that environmental CSR has a significant adverse impact on both ROA and Tobin's Q. They suggest that the negative impact indicates that investors consider environmental CSR initiatives as possible additional costs to the company. Furthermore, the study integrates the perspective of R&D, demonstrating that the interaction between environmental CSR and R&D positively influences CFP. This indirect effect is attributed to the potential benefits that R&D can provide.

Di Giuli and Kostovetsky (2014) find a significant negative correlation between CSR score improvements and stock returns. They examine the 3,000 largest U.S. companies during the period 2003-2009 using pooled OLS regression. They calculate the CSR scores with 30 CSR strengths and 26 concerns from KLD. The results indicate that adding one CSR strength is associated with a 1,2% lower stock performance in the following year. Moreover, they show an adverse relationship between CSR score and ROA. They further investigate how CSR scores affect the revenue growth of a firm but find no significant association. According to Di Giuli and Kostovetsky (2014), social responsibility benefits might come at the cost of firm value. Consistently, Borghesi et al. (2014) show an adverse direct effect of industry-adjusted CSR levels on stock returns despite showing that CSR has positive indirect effects on firm performance. They examine over 11,000 firm-year observations from 1992 to 2006 and calculate the CSR index for each company using data from KLD. Furthermore, the findings of the study show that firms with a higher proportion of institutional ownership are less likely to engage in CSR initiatives.

4.3 Neutral impact or mixed results

Certain studies do not find any impact of ESG on CFP. MacWilliams and Siegel (2000) investigate 524 firms from 1991 to 1996. They analyze the effect of CSR ratings from KLD to CFP. The results of the study show that when R&D investments are not accounted for

in the regression, the findings indicate that CSR has a significant positive impact on CFP. However, when R&D investments are included in the equation, the effect of CSR on CFP decreases dramatically and is no longer statistically significant. Furthermore, they find a strong correlation between CSR and R&D investments. MacWilliams and Siegel (2000) argue that a significant portion of studies that have observed a positive correlation between CSR/ESG and CFP have resulted from incorrectly specified equations.

Similar to MacWilliams and Siegel (2000), Ariño et al. (2010) argue that many previous studies on CSR/ESG and CFP have reached erroneous conclusions because of methodological issues. They examine the relationship between KLD CSR scores and CFP using data from 658 firms during 1991-2005. They employ a mix of ordinary least squares (OLS), fixed effects, as well as instrumental variable techniques to compare their outcomes with prior research, addressing the issue of endogeneity. Ariño et al. (2010) measure CFP using Tobin's Q, ROE, ROA, and market value-added. They find that the positive impact observed in many previous studies between ESG/CSR and CFP disappears when the endogeneity issue is considered in the regression. They suggest that companies with specific features conducive to good financial performance are more likely to invest in ESG/CSR initiatives. Thus, they argue that the cause-and-effect relationship in many prior studies has been misinterpreted.

Humphrey et al. (2012) show that the relationship between ESG and CFP is neutral. They examine 256 companies from the UK during the period of 2002-2010 utilizing ESG ratings from Sustainability Asset Management Group GmbH (SAM). They create high and low ESG portfolios of companies to examine the impact of ESG on stock returns, total risk, and Sharpe ratios using the four-factor model. The findings show that the stock returns for low ESG portfolios are generally higher but statistically insignificant. On the other hand, they find that high ESG portfolios have significantly lower total risk. However, the alphas associated with the portfolios lack statistical significance, suggesting that there is not a notable contrast in the risk-adjusted performance between portfolios with high

and low ESG rankings. Thus, the results suggest that there is no significant financial disadvantage or advantage related to investing in ESG. Humphrey et al. (2012) additionally study industry-specific effects, which are discussed in the chapter 4.4.

Buchanan et al. (2018) show mixed results when examining the effect of Bloomberg ESG score on firm value, measured by Tobin's Q. Their sample consists of firms included in the Russell 3000 index. As a research period, they use both the pre-financial crisis period from 2006 Q1 to 2007 Q2 and the crisis period from 2008 Q3 to 2009 Q1. The results of the study show that before the financial crisis, companies focusing on ESG exhibit significantly higher Tobin's Q compared to those firms that do not prioritize ESG. However, the findings of Buchanan et al. (2018) indicate that during the crisis, companies with high ESG ratings lose their value significantly more than companies with low ESG ratings. They measure the effect of CSR on firm value change during the crisis period using difference-in-difference regression analysis. They argue that the phenomenon is a result of companies overinvesting in ESG, and during times of crisis, the negative effects arising from this outweigh the positive impacts of the investments.

4.4   Industry-specific effects

Humphrey et al. (2012) investigate the impact of industry on the relationship between ESG ratings and CFP of UK companies. They categorize industries into high and low ESG portfolios and examine stock returns, total risk, and Sharpe ratio. In their study, the high ESG portfolio includes industries such as utilities, basic resources, banks, as well as oil and gas while the low ESG portfolio includes industries such as industrial goods and services, construction and material, and technology. The results suggest that in industries with high ESG ratings, the relationship between ESG and CFP is negative, as indicated by a negative alpha. Conversely, in industries with low ESG ratings, alpha is positive in most tests. However, the results lack statistical significance. Thus, Humphry et al. (2012) do not find statistically significant asymmetry in the relationship between ESG and CFP across different industries.

Gonçalves et al. (2018) investigate the impact of industry characteristics on the relationship between ESG performance and the market value of equity for Brazilian companies during the period of 2010-2015. They classify companies according to the nature of their industry into either environmentally sensitive or non-sensitive categories. In their study, environmentally sensitive industries encompass sectors such as energy, utilities, and materials. They investigate the impact by incorporating an interaction term between the ESG score and an environmentally sensitive dummy variable into their model. According to the results, ESG performance has a stronger positive value on a company's market value of equity in environmentally sensitive industries. Gonçalves et al. (2018) hypothesize that the observed phenomenon could be attributed to the higher demands and expectations for ESG initiatives within environmentally sensitive industries. As a result, enhancements in ESG practices are more readily recognized and appreciated by stakeholders in these sectors (Gonçalves et al., 2018). Conversely, they suggest that in non-sensitive industries, ESG improvements may not capture as much attention from investors, potentially leading to less recognition and acknowledgment of ESG efforts.

Chen et al. (2023) examine the relationship between ESG and ROA utilizing global sample with 3 332 listed companies from 2018 to 2022. Similarly to Gonçalves et al. (2018), they investigate the relationship between ESG and CFP across environmentally sensitive and non-sensitive industries. However, they measure corporate financial performance with ROA metric. According to the results, the favorable effect of ESG on ROA is stronger in environmentally sensitive industries compared to non-sensitive industries. According to Chen et al. (2023) environmentally sensitive industries have stronger impact of environmental costs on their profit generation. Consequently, prioritizing resource efficiency in these sectors yields significant positive effects on financial performance (Chen et al., 2023).

Bae et al. (2021) investigate the relationship between CSR/ESG and stock market performance of 1,750 U.S. firms during the market crash caused by the COVID-19 pandemic

and the subsequent recovery period, utilizing ESG scores from both Refinitiv and MSCI. Furthermore, they investigate whether the relationship between CSR/ESG and stock returns varies between 11 different industries. According to the study, CSR/ESG does not have a significant influence on stock returns during COVID-19 for most industries. However, Bae et al. (2021) find that during the crisis period, high-ESG firms in the chemical industry earn significantly lower returns based on the MSCI ESG score. In contrast, high-ESG firms in business equipment and health care industries earn significantly higher returns based on Refinitiv ESG scores. According to Bae et al. (2021), during the subsequent recovery period, only high-ESG firms in the chemical industry earn significantly higher returns based on Refinitiv ESG scores.

Al Hawaj and Buallay (2022) study the effect of Bloomberg ESG scores on CFP, as measured by return on assets, Tobin's Q, and return on equity across seven different industry groups. They use data from 3000 companies across 80 countries during the period of 2008-2017. The sample companies were categorized into seven different sectors: Agriculture & food, energy, manufacturing, banks & financial services, retail, telecommunications & information technology, and tourism (Al Hawaj & Buallay, 2022). The findings of the study reveal asymmetric effects of ESG on CFP across different sectors. In manufacturing and retail sectors, ESG exhibits a positive and significant impact on all CFP measures. For the tourism sector, ESG affects positively on ROA and Tobin's Q, but the effect on ROE is insignificant. Conversely, Al Hawaj and Buallay (2022) find no significant impact of ESG on CFP in the agriculture & food sector. In the energy and telecommunications & information technology sectors, the effect is insignificant for two of the three CFP measures. Surprisingly, the results indicate a significant negative impact of ESG on CFP in the banks & financial services sector.

According to Anderson and Bams (2022), engagement in ESG activities can be either costly or profitable depending on the company's industry and operating environment. They examine the relationship between environmental performance and ROA for a sample of 1509 firms from 52 distinct industries over the period 2007-2019. They measure

environmental performance by two different types of environmental management activities. The first pertains to environmental commitment, encompassing target setting, implementation of innovative initiatives, and compliance with regulatory frameworks and policies, whereas the second aspect, environmental outcomes, focuses on measurable indicators such as pollution levels and the efficacy of waste management practices. To investigate the symmetry of the relationship between environmental performance and ROA in different industries, they categorize the sample firms into four groups: industrials, competitive, essentials, and mature. They perform pooled OLS regressions for each industry class.

The findings of the study of Anderson and Bams (2022) reveal a significant negative relationship between environmental outcomes and ROA within the "industrial" category. The category incorporates industries subject to heightened susceptibility to environmental risks and stringent environmental regulations, including industries such as chemicals, oil & gas, and construction & engineering. According to Anderson and Bams (2022), the companies within this category have high capital expenditures, which increases the cost of transitioning to environmentally friendly practices. The results show that firms classified under the "competitive" category demonstrate a significantly positive correlation between environmental commitment and ROA, whereas the relation between environmental outcomes and ROA appears insignificant. "Competitive" category encompasses industries close to consumers, related to, for example, food, household, health care, and personal electronics (Andersen & Bams, 2022). Andersen and Bams (2022) propose that consumers exhibit heightened interest in a company's commitment to environmental sustainability, as evidenced, for example, by the presence of environmental labels on product packaging, while the variations in actual pollution levels may not evoke a similar response. Andersen and Bams (2022) suggest that the result may be due to a lack of information among customers. Unlike in the industries categorized as "industrials" and "competitive, no statistically significant relationship between environmental performance and ROA is observed in the "essential" and "mature" industries.

Consistent with Alh Hawaj and Buallay (2022), Alfalih (2023) investigates the impact of ESG disclosure practices on CFP as measured by ROA and Tobin's Q. The sample consists of 281 companies in the S&P 500 over the period from 2010 to 2019. Alfalih (2023) compares the results by dividing the companies into manufacturing and service sectors based on the industry. Using ordinary least squares regression, the results indicate that the disclosure of social and governance information has a stronger impact on CFP in the manufacturing sector, whereas the disclosure of environmental information has a stronger impact on CFP in the service sector. Alfalih (2023) states that the classification of industries into only two broad sectors is a limitation of the study, and he emphasizes that a more detailed examination between industries is needed for future research.

4.5   Summary of the prior research and evaluation of inconsistent results

The existing body of research of the effects of ESG on CFP reveals conflicting results. However, prior research leans towards the hypothesis that the association between ESG and CFP is predominantly either positive or neutral.

Among the studies discussed in this thesis, only Lioui and Sharma (2012) and Di Giuli and Kostovetsky (2014) demonstrate unequivocal and robust results indicating a negative relationship between ESG and CFP. While Garcia et al. (2007) identify a negative relationship between CSR and CFP, they acknowledge that these findings lack robustness over time, with the negative correlation diminishing in the long term. Borghesi et al. (2014), despite showing an adverse impact of CSR on stock returns during 1992-2006, highlight several positive indirect effects on firm performance, such as the ability to attract high-talent employees and build stronger customer relationships. Buchanan et al. (2018) also report mixed results, showing that companies focusing on ESG had significantly higher Tobin's Q before the 2007-2008 financial crisis compared to those not prioritizing ESG. However, they observe that high ESG-rated companies experienced more significant loss in firm value during the crisis compared to their low ESG-rated counterparts.

Ma and Yasir (2023) suggest that one reason for the inconsistency in previous research is that the majority of the existing research assumes a linear relationship between ESG and CFP. In other words, previous research mainly assumes that despite the level of ESG intensity, the impact of ESG on CFP remains consistent. Ma and Yasir (2023) demonstrate that the relationship between ESG and CFP follows an inverted U-shape, rather than a linear line. Their findings indicate an overall positive and significant effect of ESG on CFP in Chinese companies during 2011-2020. However, they emphasize that the relationship does not remain consistent at all levels of ESG intensity. According to their analysis, ESG initially exhibits a positive and significant impact on CFP, but at exceptionally high levels of ESG commitment, the relationship begins to shift towards a negative direction.

Another potential factor contributing to the inconsistent results is the divergence in ESG ratings across different providers (see, e.g., Bae et al., 2021; Avramov et al., 2022; Berg et al., 2022). A large part of the existing research on ESG and CFP relies on ESG ratings as a proxy for ESG performance in their analyses. However, several studies reveal significant disparities in ESG ratings provided by various sources. According to Avramov et al. (2022), the mean correlation between ESG ratings provided by Refinitiv, MSCI, Bloomberg, Sustainanalytics, and RobecoSAM is only 0,48. Similarly, Berg et al. (2022) show that the correlations between ESG ratings from Sustainalytics, KLD, Moody's ESG, MSCI, S&P Global, and Refinitiv range from 0,38 to 0,71. Furthermore, Bae et al. (2021) show that the ESG ratings from MSCI and Refinitiv, which are among the most widely used ESG rating providers, exhibit a correlation of only 0,38. These results indicate that research findings show considerable variation depending on the specific provider of ESG ratings utilized in the study.

5   Data and methodology

This paragraph introduces the methodology and the data used in the study. The aim of the study is to investigate how ESG score affects corporate financial performance. In addition, the thesis examines whether the impact of ESG on financial performance is symmetrical across different industries. In order to measure the relationship, this study utilizes panel regression analyses following the previous studies of ESG and CFP, such as Ariño et al. (2010), Kristjanpoller et al. (2019) and Al Hawaj and Buallay (2022).

5.1   Data

The data for the thesis includes publicly listed companies from 16 European Union member states for the period of 2012-2022. In the study, ESG performance is measured using firm specific ESG ratings, while financial performance is assessed using Tobin's Q and Return on Assets (ROA). Additionally, various control variables are used to account for potential confounding factors that could influence the relationship between ESG and CFP. Both the ESG data and financial data utilized in the study are collected from Refinitiv Eikon Datastream.

The initial sample includes all active listed companies from 16 European Union member states during 2012-2022. First, companies with no single ESG score available during the research period are excluded, resulting in 2,115 companies remaining in the sample. Subsequently, firm-year observations lacking any of the financial variables used in the study are removed from the dataset. An exception to this is the R&D expenditures, for which fewer firm-year observations are available. The missing values have been replaced with a value of zero in the data. Finally, the dual listings are removed. After the filtering process, the final sample comprises 814 companies and 8,950 firm-year observations from 16 different countries. The companies are categorized into 11 industry groups ac-

cording to the Global Industry Classification Standard: Energy, materials, industrials, con-sumer discretionary, consumer staples, health care, financials, information technology, communication services, utilities, and real estate (MSCI, 2023).

Table 1. Companies per industry group

Industry group	Number of companies
Materials	123
Financials	114
Industrials	94
Consumer Staples	84
Consumer Discretionary	77
Health Care	73
Communication Services	68
Utilities	68
Information Technology	64
Real Estate	25
Energy	24
Total	**814**

The largest industry groups in the sample are materials, financials, and industrials. On the other hand, the industries of real estate and energy include the fewest companies in the sample. According to the existing literature, materials, energy, and utilities are con-sidered as ESG-sensitive industries (see, e.g., Humphrey et al., 2012; Hennigs & Kilian, 2014; Gonçalves et al., 2018). On the other hand, industries such as financials, commu-nication services, information technology, consumer staples, and consumer discretion-ary are often considered as non-sensitive to ESG issues (see, e.g., Borghesi et al., 2014; Hennigs & Kilian, 2014). Instead, the industry groups of industrials, health care, and real estate have not been clearly defined into either category in the previous literature.

Table 2. Companies per nation

Nation	Number of companies
GERMANY	176
FRANCE	138
SWEDEN	84
DENMARK	64
NETHERLANDS	64
FINLAND	62
SPAIN	58
ITALY	43
BELGIUM	35
AUSTRIA	35
IRELAND	22
PORTUGAL	10
POLAND	8
GREECE	7
SWITZERLAND	5
HUNGARY	3
Total	**814**

Since the selection of companies in the sample was contingent on the public availability of ESG information and financial variables, the number of firms per country may not necessarily align with the economic scale of each nation. As expected, the major economies within the European Union, such as Germany and France, dominate the representation in the sample. However, smaller Nordic countries, including Sweden, Denmark, and Finland, exhibit an overrepresentation relative to their economic sizes. Conversely, Spain and Italy are underrepresented in the sample relative to their economic size. This discrepancy may be attributed to the well-established reputation of Nordic countries as leaders in sustainability, resulting in a more proactive disclosure of ESG information by companies in these regions (Vincentiis, 2022). Consequently, ESG ratings were notably accessible for companies operating within these Nordic countries.

5.1.1 Dependent variables

This study utilizes both market-based and accounting-based measures to analyze corporate financial performance. To analyze forward-looking performance by investor sentiment and expectations, a market-based measure is used. On the other hand, to measure the actual historical performance of the company, an accounting-based measure is utilized. The dependent variables of this study are market-based firm valuation and accounting-based profitability. In line with previous research, this study measures firm valuation using Tobin's Q (see, e.g., Albuquerque et al., 2018; Buchanan et al., 2018; Kristjanpoller et al., 2019; Boulhaga et al., 2022). Tobin's Q is the ratio of the market value of a firm's assets to the replacement cost of those assets (Kristjanpoller et al., 2019). Tobin's Q is considered a good way to measure firm value because when the ratio is larger than 1, it indicates that the market values the firm's assets more highly than their replacement cost, suggesting potential market power and profitability. Conversely, a ratio less than 1 may imply that the market values the assets less than their replacement cost, possibly indicating inefficiency or overinvestment. Following the studies of Kristjanpoller et al. (2019) and Boulhaga et al. (2022), Tobin´s Q is measured by the following equation:

$$Tobin's\ Q_{i,t} = \frac{Market\ Cap_{i,t} + PrefStock_{i,t} + Debt_{i,t}}{Total\ Assets_{i,t}},$$

where $Market\ Cap_{i,t}$ is the total market value of the firm i at time t, $PrefStock_{i,t}$ represents the value of outstanding preferres stock, $Debt_{i,t}$ is the sum of short-term debt and the current portion of long-term debt, and $Total\ Assets_{i,t}$ is the book value of the firm's total assets. For accounting-based measure, Return on Assets (ROA) is used. ROA measures a company's profitability by assessing its ability to generate earnings from its assets (Kristjanpoller et al., 2019). The equation for ROA is the following:

$$ROA_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Assets_{i,t}},$$

where $Net\ Income_{i,t}$ is a firm's net income in year t and $Total\ Assets_{i,t}$ is the book value of the firm's total assets.

5.1.2 Independent variable

The independent variable used in the study is the firm specific ESG score provided by Refinitiv. To measure ESG scores, Refinitiv uses publicly reported information, such as company websites, audited annual reports, CSR reports, stock exchange filings, and news sources. They utilize over 630 company-level ESG measures, selecting a subset of 186 that are most comparable and material per industry (Refinitiv, 2022). These measures are categorized into 10 groups, which include, for example, management, workforce, and emissions. These categories form three pillar scores: environmental, social, and corporate governance. The table below illustrates an example of the categorization and the weight of each category. However, the category weights for environmental and social pillars varies between industries whereas the governance pillar remains the same for all industries (Refinitiv, 2022).

Table 3. ESG scoring methodology (modified from Refinitiv, 2022)

ESG measures						
Pillar	*Environmental*		*Social*		*Governance*	
	Category	Weight	Category	Weight	Category	Weight
	Resources use	11%	Workforce	16%	Management	19%
	Emissions	15%	Human rights	4%	Shareholders	6%
	Innovation	11%	Community	8%	CSR strategy	5%
			Product respon-sibility	5%		
Pillar weight	37%		33%		30%	

The ESG scores from Refinitiv range from 0 to 100. Scores between 0 and 25 fall into the D-grade category, reflecting poor ESG performance and insufficient transparency in the disclosure of ESG related information (Refinitiv, 2022). The C category encompasses scores between 25 and 50, indicating satisfactory ESG performance and disclosure of

ESG information. According to Refinitiv (2022), the B and A categories, ranging from scores 50-75 and 75-100, respectively, signify good and excellent ESG performance as well as more comprehensive disclosure of ESG related information than the average.

5.1.3 Control variables

In order to examine the relationship between ESG score and CFP, it is essential to account for potential confounding variables that may influence the observed results. In accordance with previous research, this study incorporates control variables, including firm size, risk, profitability, research and development (R&D) intensity, and industry categorization. (see, e.g., Ariño et al., 2010; Gao & Zhang, 2015; Kristjanpoller et al., 2019).

Firm size is considered an important control variable when measuring the relationship between ESG and CFP. According to Ariño et al. (2010), firm size may affect corporate financial performance and the company's orientation towards stakeholders. Kristjanpoller et al. (2019) show that the size of a company is positively associated with the ESG score. Thus, in this thesis, a control variable for firm size is incorporated into the equation. Consistent with previous literature, the natural logarithm of total assets is employed as a proxy for firm size.

Firm risk has been shown to have a significant impact on CFP (see, e.g., El Ghoul et al., 2011; Albuquerque et al., 2018). Firm risk consists of systematic and unsystematic risk. In this study, systematic risk is approximated using the beta factor, while unsystematic risk is represented by the financial leverage ratio, which is calculated by the ratio of total debt to total assets. In line with previous research, companies with higher leverage ratio are perceived as riskier, and this is likely to adversely affect their financial performance.

Previous research has controlled for profitability in the regression models where Tobin's Q is used as the dependent variable. For example, Kristjanpoller et al. (2019) show that

ROA, which is typically used as a proxy for profitability, has a positive and significant impact on Tobin's Q. Consequently, this study assumes that ROA affects Tobin's Q and thus incorporates it as a control variable into the equation.

Furthermore, this study controls for research and development (R&D) intensity. MacWilliams and Siegel (2000) argue that many studies related to CSR/ESG and CFP are misdefined as they do not control R&D expenses. They claim that R&D expenditures are closely linked to a company's profitability. Additionally, they propose that R&D investments strongly correlate with CSR/ESG ratings, as both are associated with product and process innovations. Thus, it is expected that R&D intensity has a positive effect on CFP. To measure R&D intensity, R&D expenditures are divided by sales.

Finally, industry dummies are included in the regression model to control for industry-specific effects. The sample comprises companies categorized into 11 industry groups following the Global Industry Classification Standard. However, to avoid the dummy variable trap, only 10 dummy variables are used in the regression (Stock & Watson, 2020). The dummy variables are created for each industry group except for materials, which serves as the base category in the analysis. A dummy variable takes a value of 1 if the firm belongs to its respective industry group, and 0 otherwise.

Table 4. Summary of variables

Variable	Proxy for	Variable definition
Dependent variables		
ROA	Profitability	Net income / Total assets
Tobin's Q	The ratio of the market value of a firm's assets to the replacement cost of those assets	(Market cap + Preferred stock + Debt) / Total assets
Independent variable		
ESG	Firm specific ESG performance	Combined ESG score from Refinitiv
Control variables		
Size	Firm size	Natural logarithm of total assets
Beta	Systematic firm risk	Volatility of a stock against its benchmark
Leverage	Unsystematic firm risk	Total debt / Total assets
R&D	Research and development intensity	R&D expenditures / Revenue
Industry	Industry in which a firm operates	Categorized into 11 industry groups following the Global Industry Classification Standard

5.1.4 Descriptive statistics

Table 5 below illustrates the descriptive statistics for the sample data, encompassing the dependent variables, independent variable, and control variables. Industry dummies are excluded. Each variable comprises 8,950 observations. Following Lins et al. (2017), the potential issues arising from outliers are addressed by winsorizing all variables at the 1st and 99th percentiles.

Table 5. Descriptive statistics

	ESG score	ROA	Tobin's Q	Size	R&D	Leverage	Beta
Mean	68,40	5,04	1,11	17,11	2,46	25,47	1,02
Median	72,41	4,20	0,61	17,02	0,00	24,38	1,01
Std. Dev.	17,51	6,45	1,57	1,82	4,75	14,34	0,44
Kurtosis	0,88	5,75	14,81	0,04	5,92	-0,35	0,24
Skewness	-1,09	1,59	3,59	0,36	2,48	0,38	0,44
Minimum	13,20	-11,37	0,03	13,13	0,00	0,20	0,14
Maximum	93,21	34,17	9,99	22,05	23,33	64,65	2,27
Observations	8950	8950	8950	8950	8950	8950	8950

The average ROA (in percentages) for the sample firms is 5,04. The average Tobin's Q is 1,11, indicating that, on average, the market value of the firms´ assets is 11% higher than the replacement value of their assets. The average ESG score in the sample is 68,40. The average is relatively high compared to previous research on European companies. For example, Boulhaga et al. (2022) report an average ESG score of 51,1 for French companies, while Velte (2017) reports an average of 56,6 for German companies. However, their research periods are 2012-2018 and 2012-2014, respectively, which likely has an impact on the lower average ESG score found in their research samples. Furthermore, the Nordic countries are well-known for their high ESG scores, which elevate the overall average in this study. The relatively high standard deviation can be partially attributed to a notable upswing in companies' ESG scores from the beginning to the end of the study period. Table 6 below presents industry specific ESG scores for the early period of the study from 2012 to 2017 and the subsequent period from 2018 to 2022. The table indicates that the average ESG score is nearly 9 points higher in the latter period of the study compared to the early period.

Table 6. ESG score by industry group

	ESG scores by industry group		
Industry group	*Mean*	*2012-2017 Mean*	*2018-2022 Mean*
Energy	76,89	74,57	79,67
Information Technology	72,06	68,46	76,43
Utilities	70,56	67,67	74,02
Industrials	69,52	63,93	76,17
Materials	69,14	64,10	75,12
Health Care	68,97	63,33	75,73
Consumer Discretionary	68,91	65,84	72,58
Communication Services	68,42	66,60	70,55
Consumer Staples	66,33	62,05	70,97
Financials	63,99	57,86	70,96
Real Estate	60,99	56,86	65,91
Total	68,40	64,66	73,47

The Table 6 illustrates that energy, information technology, and utilities have the highest ESG scores, whereas consumer staples, financials, and real estate have the lowest ESG scores. Interestingly, all the three so-called ESG-sensitive industries, as proposed by Humphrey et al. (2012), Hennigs and Kilian (2014), and Gonçalves et al. (2018), rank among the top 5 performers in terms of ESG performance. These ESG-sensitive industries include energy, utilities, and materials. This result is in line with the studies of Humphrey et al. (2012) and Garcia et al. (2017), which show that firms operating in ESG-sensitive industries tend to exhibit superior ESG performance. According to Humphrey et al. (2012), industries sensitive to ESG considerations experience significant social and regulatory pressure, compelling them to invest in ESG practices. This finding aligns with legitimacy theory, which posits that companies aim to maintain their perceived legitimacy among key stakeholders. Consequently, ESG-sensitive industries often disclose their ESG practices as a protective measure for their reputation (Humphrey et al., 2012).

The figure 1 below illustrates the mean Tobin's Q across different industry groups. The graph indicates that Tobin's Q varies significantly across different industries. This highlights the importance of including industry as a control variable in the regression analysis. The highest Tobin's Q is in the health care sector, where the average Tobin's Q is 3,54,

and conversely, the lowest Tobin's Q is in the financial sector, with an average Tobin's Q of only 0,29.

Figure 1. The mean Tobin's Q across industries
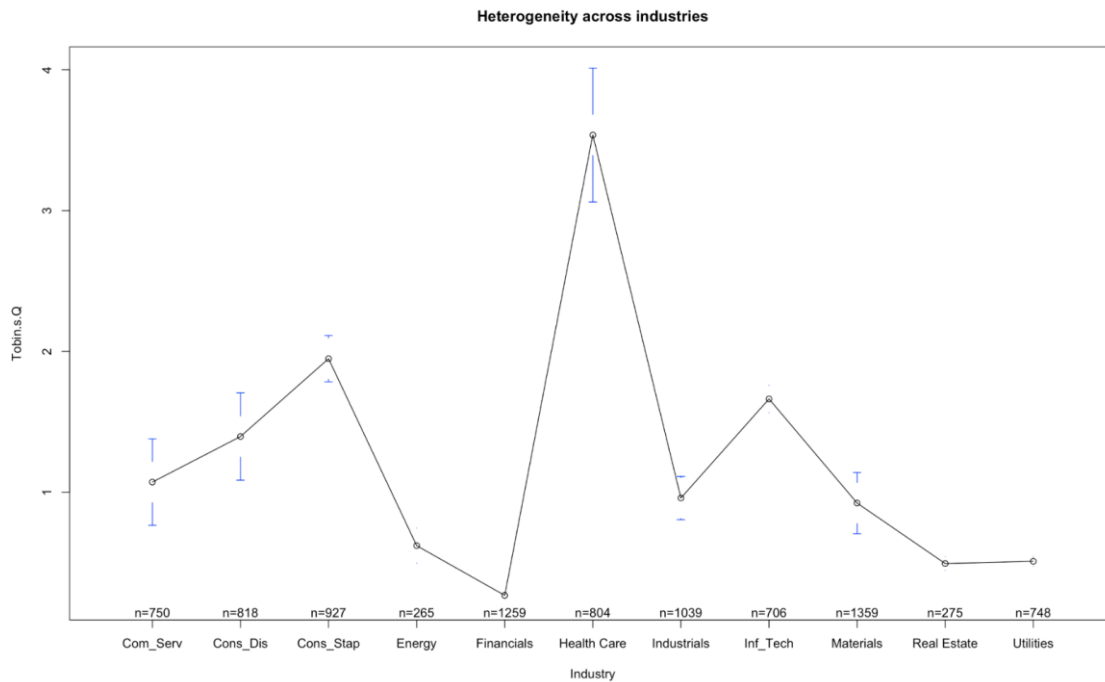
Similarly, figure 2 illustrates the mean ROA across different industry groups. Again, significant differences among sectors are evident. As for Tobin's Q, the health care sector exhibits the highest average ROA, being 11,73%. The lowest profitability is observed in the communication services sector, where the average ROA is 1,28%. The graphs exhibit a similar pattern for both Tobin's Q and ROA, indicating a strong correlation between the dependent variables. The correlation matrix is presented in subchapter 5.1.6., where further discussion on the relationships between variables is provided.

Figure 2. The mean ROA across industries
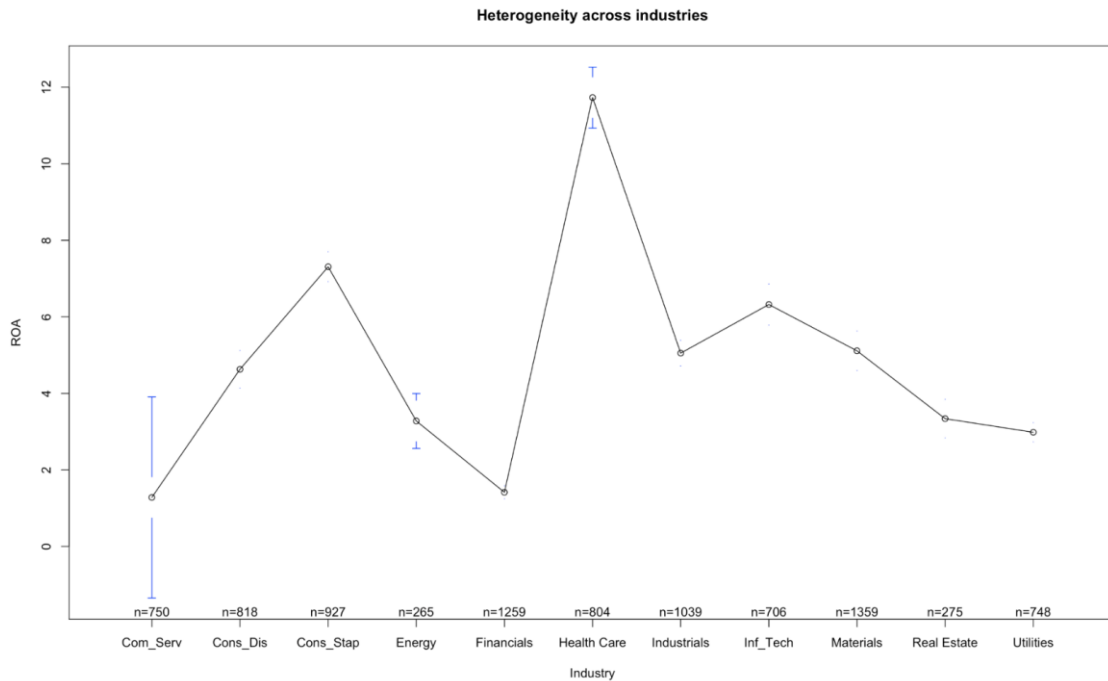
5.1.5 Data diagnostics

To assess the reliability and validity of the data, diagnostic tests are conducted to examine the normality and multicollinearity of the data. Following Al Hawaj and Buallay (2022), the normality of the data is tested using the Jarque-Bera test, and multicollinearity is assessed by calculating the Variance Inflation Factor (VIF).

The Table 7 below shows the data and variable diagnostics results for the Jarque-Bera test and VIF metrics. According to Büning and Thadewals (2007) the Jarque-Bera test statistic is calculated using the skewness and kurtosis measures derived from the sample data. The results indicate that the p-value is < 0,05 for all numeric variables, thus rejecting the null hypothesis of normal distribution for all variables. Therefore, the results indicate that the data is not normally distributed. One common approach to address the issue of non-normality in data is to use the natural logarithm of variables. However, the use of the natural logarithm requires positive values. Since ROA can also take negative

values, the application of the natural logarithm is only an appropriate approach for the model where Tobin's Q is the dependent variable. According to Al Hawaj and Buallay (2022), non-normally distributed data may not necessarily affect the reliability of linear regression analysis in situations where there is a large amount of data. Since the data used in this study comprises nearly 9000 observations, it is assumed that the non-normal distribution of the data does not compromise the reliability of the results.

The efficiency of the linear model relies on the assumption that independent variables are not strongly correlated. When extreme multicollinearity occurs, it often leads to inflation in the standard errors of the coefficients (Al Hawaj & Buallay, 2022). The Variance Inflation Factor (VIF) is a diagnostic tool used to assess multicollinearity, a condition where predictor variables in a regression model are highly correlated with each other (O'Brien, 2007). The commonly accepted threshold for severe multicollinearity is often set at 10, yet O'Brien (2007) suggests that a value as low as 4 could already signal significant multicollinearity. The findings reveal that for both ROA and Tobin's Q as dependent variables, the VIF values of the explanatory variables remain moderate, ranging between 1,0 and 1,4. Consequently, it appears that multicollinearity does not present a notable concern within the dataset used in the study.

Table 7. Data diagnostics

Variable	Jarque-Bera		VIF	
	P-Value	Test result	ROA	Tobin's Q
TOBIN	0,00	Reject Null	N/A	N/A
ROA	0,00	Reject Null	N/A	1,0176
ESG	0,00	Reject Null	1,2936	1,2982
SIZE	0,00	Reject Null	1,2709	1,2722
R&D	0,00	Reject Null	1,0665	1,0686
LEV	0,00	Reject Null	1,0265	1,0337
BETA	0,00	Reject Null	1,0178	1,0222

5.1.6 Correlation analysis

A correlation matrix below presents the correlation coefficients between the variables used in the study. In line with the Variance Inflation Factor, the correlation analysis alleviates concerns regarding collinearity, which refers to a strong linear relationship between two or more variables (O'Brien, 2007). Generally, an absolute correlation exceeding 0,7 indicates the presence of collinearity. None of the variables used in the study exhibit correlations exceeding 0,7. The highest correlation exists between the two dependent variables, ROA and Tobin's Q, being 0,6. Otherwise, the correlations between variables appear quite moderate, ranging from 0,02 to 0,43 in absolute terms.

Figure 3. Correlation matrix

	ROA	Tobin.s.Q	Beta	Leverage	ESG.score	Size	
						0.43 ***	ESG.score
				0.09 ***	0.07 ***		Leverage
			−0.02 ns	0.13 ***	0.03 *		Beta
		−0.09 ***	−0.22 ***	−0.10 ***	−0.26 ***		Tobin.s.Q
	0.60 ***	−0.12 ***	−0.23 ***	−0.04 ***	−0.16 ***		ROA
0.17 ***	0.28 ***	0.04 ***	−0.14 ***	0.15 ***	−0.10 ***		R.D

ns p >= 0.05; * p < 0.05; ** p < 0.01; and *** p < 0.001
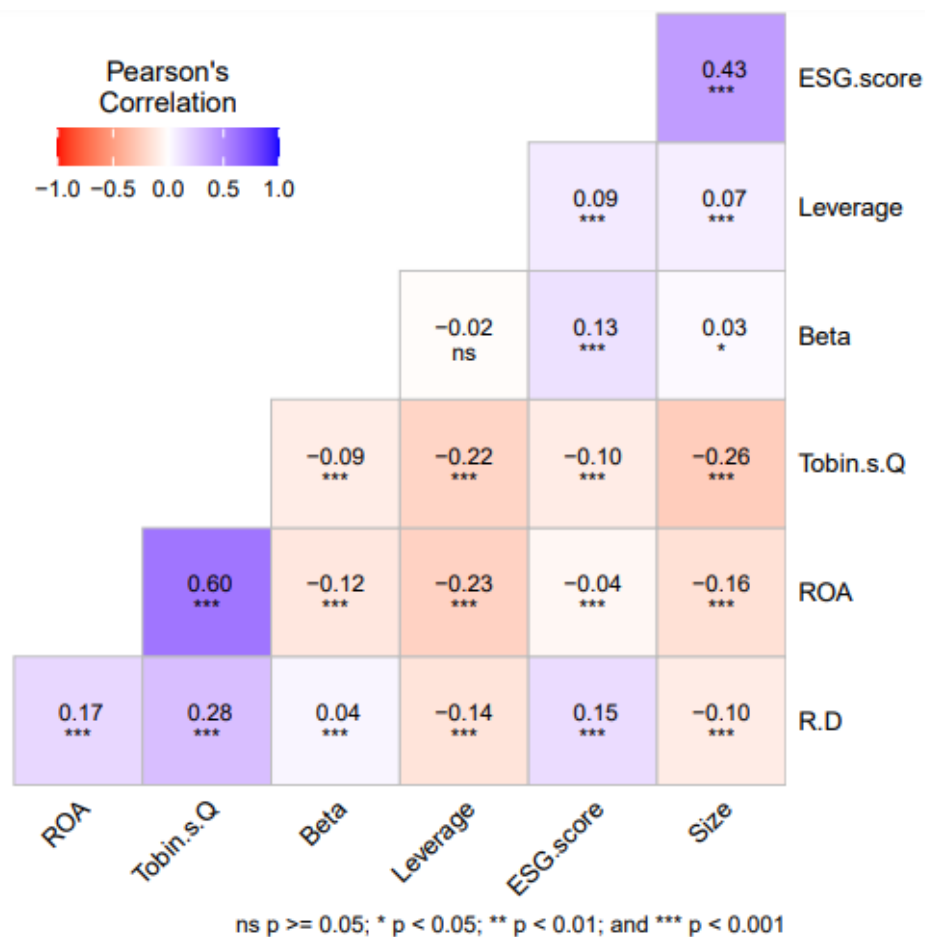
Interestingly, the correlation matrix above shows significant negative correlations between ESG and ROA as well as ESG and Tobin's Q, being -0,04 and -0,10, respectively. Furthermore, the table reveals a strong positive correlation of 0,60 between Tobin's Q and ROA, suggesting that an increase in one dependent variable is associated with an increase in the other. This result indicates that including ROA as a control variable in the regression in which Tobin's Q is the dependent variable is necessary. Both Tobin's Q and ROA are negatively related to leverage and beta, which are used to reflect the riskiness of the company. Furthermore, both dependent variables are negatively associated with firm size. However, the relationship is stronger with Tobin's Q.

As expected, firm size and ESG score show a high correlation of 0,43. This result aligns with the suggestion of Kristjanpoller et al. (2019), according to which larger companies have more assets at risk, which increases their incentive to strive for legitimacy. Another expected result is that both dependent variables are positively and significantly correlated with R&D intensity. This finding aligns with MacWilliams and Siegel (2000), who argue that R&D expenditures are strongly linked to corporate financial performance. This emphasizes the significance of incorporating R&D intensity as a control variable in the regression analysis. Furthermore, R&D intensity is positively and significantly correlated to ESG score, which indicates that firms investing in research and development are also likely to invest in ESG practices. In summary, the table shows that the ESG score has a positive correlation with all the control variables, which emphasizes the significance of incorporating the control variables in the regression analysis.

5.2 Methodology

To investigate the impact of ESG scores on Tobin's Q and ROA in the sample companies, linear panel regression models are employed. This study uses two distinct methods to estimate the model: Pooled Ordinary Least Squares Regression (POLS) and Fixed Effects. The models are adjusted from prior research of ESG and CFP (see, e.g., Ariño et al., 2010; Kristjanpoller et al., 2019; Al Hawaj & Buallay, 2022; Andersen & Bams, 2022). In line

with previous literature, the POLS is employed as a base model. The equations for the POLS regression models are as follows:

(1) $\quad ROA_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BETA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 R\&D_{i,t} + \beta_7 IND_i + \varepsilon_{i,t}$,

(2) $\quad Tobin's\ Q_{i,t} = \beta_0 + \beta_1 TQ_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BETA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 ROA_{i,t} + \beta_7 R\&D_{i,t} + \beta_8 IND_i + \varepsilon_{i,t}$

where i represents the firm-specific subscript and t represents the subscript for each year. β_0 is the constant intercept, β is the regression coefficient, $ROA_{i,t-1}$ and $TQ_{i,t-1}$ are the lagged variables used for controlling autocorrelation, $ESG_{i,t}$ is the combined score of environmental, social, and governance performance of the firm, $SIZE_{i,t}$ is the natural logarithm of total assets, $BETA_{i,t}$ refers to the firm's systematic risk, $LEV_{i,t}$ is the financial leverage ratio, $ROA_{i,t}$ is the return on assets, $R\&D_{i,t}$ is the R&D intensity calculated by dividing R&D expenditures by sales, and ε is the error term. Finally, the following industry dummies are incorporated into the equation. The dummy variables are created for each industry group except for communication services, which serves as the base category in the analysis. A dummy variable takes a value of 1 if the firm belongs to its respective industry group, and 0 otherwise.

$IND1_{i,t}$ = Industry dummy for information technology
$IND2_{i,t}$ = Industry dummy for utilities
$IND3_{i,t}$ = Industry dummy industrials
$IND4_{i,t}$ = Industry dummy for energy
$IND5_{i,t}$ = Industry dummy for health care
$IND6_{i,t}$ = Industry dummy for consumer discretionary
$IND7_{i,t}$ = Industry dummy for materials
$IND8_{i,t}$ = Industry dummy for consumer staples
$IND9_{i,t}$ = Industry dummy for financials

$IND10_{i,t}$ = Industry dummy for real estate

Despite its widespread application, the POLS model exhibits notable limitations. It relies on certain assumptions such as linearity, homoscedasticity, independence, and normally distributed errors (Stock & Watson, 2020). If these assumptions are violated, it can result in biased parameter estimates. POLS model fails to account for individual heterogeneity, imposing unvarying intercepts and slope coefficients across all observations. This neglects the unique characteristics inherent to each firm, which are captured by the firm-specific unobserved effects denoted as α_i. In a situation where an unobserved effect is detected, correlating with the independent variable while also determining the dependent variable, the POLS model starts to suffer from inconsistency and omitted variable bias (Stock & Watson, 2020).

While OLS standard errors remain consistent if regression residuals are uncorrelated across firms and time periods, this independence is unlikely in financial panel data (Thompson, 2011). The fixed effects model often works better in situations where panel data is used, where the observations are consecutive time series from several units (Stock & Watson, 2020). A fixed-effects model includes individual constants that account for persistent characteristics among individuals or groups that may affect both independent and dependent variables. Thus, the model partially corrects for omitted variable bias. Additionally, the fixed effects model enables the control of persistent characteristics, resulting in a more accurate assessment of the impact of other variables on the dependent variable (Stock & Watson, 2020).

According to Andersen and Bams (2022), in situations where the presence of endogeneity is likely, it is preferable to employ a fixed effects model rather than a POLS model. Since this study cannot rule out the presence of omitted variable bias or simultaneity in the base model, the usage of a fixed effects model becomes essential. Thus, in addition to POLS models, the following fixed effects regressions are included in the analysis, in line with the study of Ariño et al. (2010).

(3) $ROA_{i,t} = \beta_1 ROA_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 R\&D_{i,t} + \alpha_i + \lambda_i + \varepsilon_{i,t},$

(4) $Tobin's\ Q_{i,t} = \beta_1 TQ_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 ROA_{i,t} + \beta_6 R\&D_{i,t} + \alpha_i + \lambda_i + \varepsilon_{i,t},$

where α_i is the firm-specific fixed effect and λ_i is the time fixed effect. The fixed effects model inherently incorporates industry-specific fixed effects, obviating the necessity to incorporate dummy variables for industry groups separately within the equation.

The relationship between ESG and CFP across different industry characteristics will be analyzed by categorizing industries into 5 different categories based on the nature of the industry. The industries used in the study are industrials, services, consumer goods, energy, and financials. The industrials category encompasses industries related to the manufacturing, production, and infrastructure of physical products. Based on the GICS classification, this category includes industrials, materials, and utilities sectors. The services category covers industries primarily offering services and intangible products. As per the GICS classification, this category includes communication services, information technology, and health care sectors. The consumer goods category comprises industries producing consumer goods directly for end consumers. The category includes consumer discretionary and consumer staples sectors. Energy and finance have been included in the analysis as separate categories. Real estate, as per GICS classification, is excluded from the analysis due to the distinct nature of the industry. The sector-specific analysis is conducted by employing Pooled OLS models for each industry category with following equations:

(5) $ROA_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BETA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 R\&D_{i,t} + \varepsilon_{i,t},$

(6) $\quad Tobin's\ Q_{i,t} = \beta_0 + \beta_1 TQ_{i,t-1} + \beta_2 ESG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BETA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 ROA_{i,t} + \beta_7 R\&D_{i,t} + \varepsilon_{i,t}$

Finally, the sectoral differences are analyzed by categorizing industries into ESG-sensitive and non-sensitive sectors. As proposed by Humphrey et al. (2012), Hennigs and Kilian (2014), and Gonçalves et al. (2018), energy, utilities, and materials sectors are categorized as ESG-sensitive sectors. These sectors typically face more stringent environmental restrictions and requirements, as well as heightened ESG related risks (Gonçalves et al., 2018). The remaining industries used in the study are classified as non-sensitive sectors. The analysis is conducted using Pooled OLS model with equations (1) and (2).

6 Empirical analysis

This chapter addresses the empirical findings of the relationship between ESG performance and corporate financial performance. Section 6.1 examines the impact of ESG score on ROA and Tobin's Q, employing both Pooled OLS and Fixed Effects models. Subsequently, section 6.2 assesses the robustness and validity of the regression models, while section 6.3 discusses the industry-specific effects. Finally, section 6.4 summarizes the key findings of the study.

6.1 The effect of ESG on corporate financial performance

Table 8 presents the Pooled OLS regression results on the relationship between ESG score and corporate financial performance for listed companies from 16 European Union member states over the period 2012-2022. The table contains the results for both dependent variables derived with equations (1) and (2). According to the results, ESG score has a statistically significant, but minimal positive effect on ROA, and conversely, negative effect on Tobin's Q. Thus, the results indicate that ESG performance has a positive impact on the profitability of the company, but negative effect on the company's market value. The results are partly consistent with Velte (2017), who observes that ESG has no significant impact on Tobin's Q, whereas it has a positive and statistically significant effect on ROA. As expected, ROA and Tobin's Q vary significantly across industries. Consistent with the descriptive statistics presented in section 5.1.4, the health care sector demonstrates the highest positive impact on both ROA and Tobin's Q. Conversely, the financials sector exhibits the most significant negative impact on the dependent variables.

Table 8. Results - Pooled OLS model

	Dependent variable:	
	ROA	Tobin's Q
	(1)	(2)
ESG score	0.0002*	-0.003***
	(0.0001)	(0.001)
Lagged ROA	0.183***	N/A
	(0.011)	
Lagged Tobin's Q	N/A	0.314***
		(0.011)
ROA	N/A	0.698***
		(0.078)
Size	0.004***	-0.078***
	(0.001)	(0.007)
R&D	-0.087***	0.366
	(0.033)	(0.231)
Leverage	-0.052***	-0.091
	(0.011)	(0.074)
Beta	-0.012***	-0.112***
	(0.004)	(0.026)
Consumer Discretionary	0.032***	0.149***
	(0.007)	(0.052)
Consumer Staples	0.048***	0.452***
	(0.007)	(0.049)
Energy	0.016	-0.078
	(0.010)	(0.069)
Financials	-0.008	-0.574***
	(0.007)	(0.052)
Health Care	0.092***	0.720***
	(0.008)	(0.055)
Industrials	0.031***	0.126***
	(0.007)	(0.047)
Information Technology	0.049***	0.458***
	(0.008)	(0.056)
Materials	0.032***	0.065
	(0.006)	(0.045)
Real Estate	0.034***	-0.194***
	(0.010)	(0.071)
Utilities	0.011	-0.156***
	(0.007)	(0.049)

Constant	-0.037**	1.189***
	(0.016)	(0.116)
Observations	8,136	8,136
R^2	0.090	0.429
Adjusted R^2	0.088	0.428
F Statistic	50.249*** (df = 16; 8119)	358.342*** (df = 17; 8118)

Significance: *p<0.1; **p<0.05; ***p<0.01

As expected, profitability significantly and positively influences Tobin's Q, consistent with previous literature (see, e.g., Gao & Zhang, 2015; Kristjanpoller et al., 2019). Similarly to Ariño et al. (2010), the inclusion of the lagged variable of the dependent variable shows a positive and statistically significant effect on the dependent variable in both models. Notably, firm size demonstrates an asymmetric impact on ROA and Tobin's Q. While size exhibits a positive effect on ROA, its effect on Tobin's Q is negative. Somewhat surprisingly, R&D expenditure exhibits a statistically significant negative impact on ROA. However, it has a positive, albeit insignificant effect on Tobin's Q. This finding is in line with Ariño et al. (2010), who also observe an asymmetric effect of R&D on ROA and Tobin's Q. This phenomenon might be attributed to the initial perception of R&D spending as increased costs for firms, whereas market reactions incorporate the expected positive impacts of research and development in the future. Consistent with previous literature, both leverage and beta exhibit negative effects on the dependent variable in both models, although the effect of leverage on Tobin's Q is statistically insignificant (Gao & Zhang, 2015; Alfalih, 2023).

The R^2 of the model (1) is approximately 0,1, indicating that only about 10% of the variation in the dependent variable is explained by the independent variables. However, in model (2), the R^2 is over 0,4, which indicates significantly better explanatory power of the model. Nevertheless, the F-statistics of both models are statistically significant, providing evidence that the models' variables can explain the variation in the dependent variable. The research dataset originally comprises a total of 8 950 observations. However, due to the inclusion of the first lag of the dependent variable, the total number of data points is subsequently reduced to 8 136.

Table 9 shows the fixed effects model results derived with equations (3) and (4). In the fixed-effects (FE) model, the impact of ESG on ROA intensifies and its statistical significance increases compared to the Pooled OLS regression model. The influence of ESG on ROA in the Pooled OLS model was 0,02 percentage points at the 10% significance level, whereas in the FE model, the impact increases to 0,1 percentage points with a significance level of 1%. However, the effect of ESG on Tobin's Q remains unchanged compared to the Pooled OLS model. According to the findings, a one-unit increase in ESG score results in 0,3 percentage points decrease in Tobin's Q. This result is in line with with Lioui and Sharma (2012), who observe a significant negative effect of environmental CSR on Tobin's Q. The result of the model (3) is consistent with Kristjanpoller et al. (2019), who find evidence that ESG has a statistically significant, positive impact on ROA. However, Kristjanpoller et al. (2019) also report a significant positive effect of ESG on Tobin's Q, which is inconsistent with the results of the model (4). Furthermore, the results are inconsistent with Gao and Zhang (2015), Albuquerque et al. (2018), and Boulhaga et al. (2022), who demonstrate a positive impact of ESG on firm value, as proxied by Tobin's Q.

Table 9. Results - Fixed Effects model

	Dependent variable:	
	ROA	Tobin's Q
	(3)	(4)
ESG score	0.001***	-0.003***
	(0.0002)	(0.001)
ROA	N/A	0.145**
		(0.074)
Size	-0.004	-0.352***
	(0.005)	(0.031)
R&D	-0.602***	-1.397***
	(0.066)	(0.439)
Leverage	-0.099***	-0.107
	(0.018)	(0.118)
Observations	8,950	8,950
R^2	0.017	0.031
Adjusted R^2	-0.082	-0.066
F Statistic	34.325*** (df = 4; 8132)	52.443*** (df = 5; 8131)
Significance:		*p<0.1; **p<0.05; ***p<0.01

In the FE model, the positive impact of size on ROA, as indicated by the Pooled OLS model, disappears, and the negative impact on Tobin's Q intensifies. The impact of ROA on Tobin's Q remains positive and statistically significant, although reduced in the FE model compared to the Pooled OLS model. In this model, the impact of R&D becomes negative on both dependent variables. The negative effect of R&D on ROA, estimated by the Pooled OLS model, intensifies in the FE model. The positive, albeit insignificant effect of R&D on Tobin's Q, estimated by the Pooled OLS model, turns significantly negative. Similarly, the negative effect of leverage on ROA intensifies in the FE model compared to the Pooled OLS model. Instead, the effect of leverage on Tobin's Q remains insignificant. However, the explanatory power of the FE model is significantly reduced compared to the Pooled OLS model. In the FE models, the R^2 values are between 0,01-0,03, whereas in Pooled OLS model, the corresponding values are between 0,09-0,43. This finding indicates that Pooled OLS regression might be a more suitable model for explaining the variation in the dependent variables.

In summary, the results indicate that ESG performance has an asymmetric effect on corporate financial performance. According to the results, the effect of ESG on profitability, as measured by ROA, is positive, while the effect on market valuation, as measured by Tobin's Q, is negative. Hence, the null hypothesis that ESG has no effect on corporate financial performance is rejected. Consequently, the results support the first hypothesis of the study, while they contradict the second hypothesis of the study:

H_1: ESG score has a positive impact on return on assets in European companies,
H_2: ESG score has a positive impact on Tobin's Q in European companies.

Thus, the Hypothesis 1 is accepted, and Hypothesis 2 is rejected. Regarding the relationship between ESG and ROA, the results are consistent with Gao and Zhang (2015), Velte (2017), and Kristjanpoller et al. (2019). On the other hand, the results regarding the relationship between ESG and Tobin's Q are consistent with Lioui and Sharma (2012). However, this result contradicts the studies of Ferrell et al. (2016) and Albuquerque et al.

(2018), who observe a significant positive effect of ESG on Tobin's Q. The inconsistency in the results may be attributed to various factors. The previous literature has identified positive (see, e.g., Ferrell et al., 2016; Albuquerque et al., 2018), negative (see, e.g., Lioui & Sharma, 2012), and insignificant (see, e.g., Ariño et al., 2010; Velte, 2017) relationships between ESG and Tobin's Q. This variability suggests a lack of consensus within the literature, with results varying significantly depending on factors such as the geographical and sectoral configuration of included firms, the time frame of data collection, the choice of ESG metrics, and the methodologies employed. For instance, the study of Ferrell et al. (2016) encompasses the period from 2002 to 2013, indicating that only two years within the timeframe utilized in this study, 2012 to 2022, overlap with theirs. Conversely, Albuquerque et al. (2018) employ CSR scores sourced from MSCI, concentrating exclusively on firms within the United States. Consequently, the comparability between these studies is limited.

Since the results of the study are asymmetrical, they partially support both competing theories, namely shareholder and stakeholder theories. The results of the relationship between ESG and ROA are in line with the stakeholder theory, which suggests that investments in ESG initiatives lead to an enhanced profitability (Deng et al., 2013). According to the theory, prioritization of ESG enhances corporate reputation and satisfaction among internal stakeholders, consequently resulting in improved operational performance (Deng et al., 2013; Al Hawaj & Buallay, 2022). According to Saaeidi et al. (2015), the favorable impact of ESG on CFP arises from its positive influence on competitive advantage, reputation building, and customer satisfaction. However, the results regarding the relationship between ESG and Tobin's Q are in line with shareholder theory, which argues that ESG initiatives are often in conflict with the interests of shareholders (Friedman, 1962). According to Borghesi et al. (2014) and Brown et al. (2016), actions for improving ESG performance are often made at the expense of shareholders.

6.2 Model diagnostics

In order to mitigate potential biases in the linear regression analysis, this study implements specific adjustments and tests to ensure the reliability of the model. Several control variables are included in the equations to address omitted variable bias. Furthermore, a fixed effects model is employed to mitigate issues related to endogeneity. Following Ariño et al. (2010), autocorrelation is managed through the inclusion of the first lag of the dependent variable in the model. Furthermore, following Al Hawaj and Buallay (2022), autocorrelation is examined with the Durbin-Watson test, and heteroscedasticity is evaluated through the Breusch-Pagan test.

In linear regression analysis, a fundamental assumption is that each observation is independent. The Durbin-Watson statistic is a diagnostic tool to test the presence of autocorrelation within the model. Generally, in the absence of autocorrelation, the Durbin-Watson statistic is expected to fall within the range of 1,5 to 2,5, with a corresponding p-value above 0,05 (Al Hawaj & Buallay, 2022). After incorporating the initial lag of the dependent variable into the Pooled OLS regression model, the Table 10 shows that Durbin-Watson test statistic falls within the range of 2,0 to 2,2 across all models. Furthermore, the p-values exceed the 0,05 threshold. Consequently, the null hypothesis of no autocorrelation is not rejected. This analysis provides evidence that autocorrelation does not significantly distort the results within the regression models.

Table 10. Durbin-Watson test

Models	Pooled OSL		Fixed Effects	
	Durbin-Watson	P-Value	Durbin-Watson	P-Value
ROA	2,0809	0,9998	2,0724	0,9997
Tobin's Q	2,1438	1	2,1064	1

Next, the heteroscedasticity of the Pooled OSL models is evaluated through the Breusch-Pagan test. The p-values from the Breusch-Pagan tests across Pooled OSL models fell

below the standard significance level of 5%. Therefore, the null hypothesis of homosce-dasticity is rejected, implying the existence of heteroscedasticity within the regression model. To overcome this problem, robust standard errors approach is employed. The method is used to procure unbiased standard errors of OLS coefficients in the presence of heteroscedasticity (Thompson, 2011). In academic research within finance panel re-gressions, it is typical to account for correlated errors by adjusting standard errors, either across firms or across time periods (Thompson, 2011).

Table 11. Results - Robust Standard Errors

	Dependent variable:			
	ROA		Tobin's Q	
	Pooled OLS	Standard Errors	Pooled OLS	Standard Errors
ESG score	0.0002*	0.0002	-0.003***	-0.003***
	(0.0001)	(0.0001)	(0.001)	(0.001)
Lagged ROA	0.183***	0.183***	N/A	N/A
	(0.011)	(0.034)		
Lagged Tobin's Q	N/A	N/A	0.314***	0.314***
			(0.011)	(0.020)
ROA	N/A	N/A	0.698***	0.698***
			(0.078)	(0.215)
Size	0.004***	0.004**	-0.078***	-0.078***
	(0.001)	(0.002)	(0.007)	(0.009)
R&D	-0.087***	-0.087**	0.366	0.366
	(0.033)	(0.041)	(0.231)	(0.349)
Leverage	-0.052***	-0.052*	-0.091	-0.091
	(0.011)	(0.027)	(0.074)	(0.102)
Beta	-0.012***	-0.012***	-0.112***	-0.112***
	(0.004)	(0.004)	(0.026)	(0.036)
Consumer Discretionary	0.032***	0.032	0.149***	0.149**
	(0.007)	(0.020)	(0.052)	(0.067)
Consumer Staples	0.048***	0.048**	0.452***	0.452***
	(0.007)	(0.023)	(0.049)	(0.069)
Energy	0.016	0.016	-0.078	-0.078
	(0.010)	(0.018)	(0.069)	(0.078)
Financials	-0.008	-0.008	-0.574***	-0.574***
	(0.007)	(0.018)	(0.052)	(0.067)
Health Care	0.092***	0.092***	0.720***	0.720***

	(0.008)	(0.024)	(0.055)	(0.079)
Industrials	0.031***	0.031	0.126***	0.126**
	(0.007)	(0.020)	(0.047)	(0.055)
Information Technology	0.049***	0.049**	0.458***	0.458***
	(0.008)	(0.022)	(0.056)	(0.082)
Materials	0.032***	0.032	0.065	0.065
	(0.006)	(0.021)	(0.045)	(0.054)
Real Estate	0.034***	0.034*	-0.194***	-0.194***
	(0.010)	(0.018)	(0.071)	(0.067)
Utilities	0.011	0.011	-0.156***	-0.156***
	(0.007)	(0.017)	(0.049)	(0.058)
Constant	-0.037**	-0.037	1.189***	1.189***
	(0.016)	(0.055)	(0.116)	(0.161)
Observations	8,136		8,136	
R^2	0.090		0.429	
Adjusted R^2	0.088		0.428	
F Statistic	50.249*** (df = 16; 8119)		358.342*** (df = 17; 8118)	

Significance: *p<0.1; **p<0.05; ***p<0.01

The findings from Table 11 suggest that the coefficient estimates derived from the robust standard errors approach are largely consistent with those obtained through the Pooled OLS model. However, the robust standard errors approach reveals adjustments in standard errors, thereby influencing the statistical significance of specific coefficients. In robust standard errors model, the marginal effect of ESG on ROA observed in the Pooled OLS model becomes insignificant. However, the impact of ESG on Tobin's Q remains unchanged compared to the results of the Pooled OLS model, being statistically significant at 1% level. Furthermore, the robust standard errors model adjusts the impact of certain control variables, such as size, R&D, and leverage, primarily by reducing the statistical significance of the coefficients. However, the coefficient of most variables, which was found to be statistically significant in the Pooled OLS model, remains statistically significant in the robust standard errors model, albeit with a reduced magnitude. This implies that the robust standard errors model does not yield novel significant outcomes. Consequently, the model suggests that the results provided by the Pooled OLS regression can be considered reasonably reliable.

6.3   Industry analysis

Next, to test the third and fourth hypotheses in the study, the symmetry of the ESG-CFP relationship across different industries is analyzed. In order to assess how different industry characteristics and features influence the relationship between ESG and CFP, sectoral comparisons are conducted by grouping industries into broader categories based on certain attributes. First, industries are classified into five different categories based on the nature of their products and services. The five categories are industrials, services, consumer goods, energy, and financials. Secondly, sectoral variations are examined by categorizing industries into either ESG-sensitive or non-sensitive categories, to analyze how higher exposure to ESG risks affects the impact of ESG initiatives on CFP. As the analysis conducted in section 6.1 indicates that the explanatory power of the Pooled OLS model is substantially higher than that of the fixed effects model, industry-specific analyses are conducted utilizing the Pooled OLS model. To ensure the robustness of the results, robust standard errors will be applied to each model.

Table 12 displays the results of equation (5), which shows the relationship between ESG scores and profitability, as measured by ROA, across five distinct industry categories. The findings reveal an asymmetric influence of ESG on ROA across these categories. Specifically, ESG performance exhibits a significant positive impact on the industrials and consumer goods sectors. The strongest positive impact is observed in the industrials sector, where a one-unit increase in ESG score leads to 0,05 percentage point increase in ROA. Conversely, a negative and statistically significant impact between ESG and ROA is identified in the financials sector, where one-unit increase in ESG score results in 0,04 percentage point decrease in ROA. In the services and energy sectors, ESG performance does not have a statistically significant impact on ROA. The results are consistent with Alfalih (2023), who finds evidence of a more pronounced positive effect of ESG performance on the manufacturing sector compared to the service sector for S&P 500 companies.

Table 12. Industry analysis – ESG-ROA

	Pooled OLS - Dependent variable: ROA				
	Industrials	Services	Consumer Goods	Energy	Financials
ESG score	0.0005***	0.001	0.0002***	0.0005	-0.0004***
	(0.0001)	(0.0004)	(0.0001)	(0.0003)	(0.00005)
Lagged ROA	0.144***	0.164***	0.618***	0.437***	0.267***
	(0.019)	(0.022)	(0.022)	(0.062)	(0.026)
Size	0.002**	0.015***	0.001	-0.006***	-0.002***
	(0.001)	(0.018)	(0.001)	(0.002)	(0.001)
R&D	-0.117*	0.117***	-0.222***	-2.509***	N/A
	(0.069)	(0.060)	(0.054)	(0.509)	
Leverage	-0.100***	-0.041	-0.090***	-0.054*	-0.020***
	(0.012)	(0.031)	(0.010)	(0.032)	(0.005)
Beta	-0.016***	0.002	-0.008***	0.002	-0.004**
	(0.003	(0.013)	(0.003)	(0.012)	(0.002)
Constant	0.016	-0.238***	0.019	0.113*	0.076***
	(0.017)	(0.057)	(0.013)	(0.066)	(0.009)
Observations	2,861	2,055	1,584	241	1,145
R^2	0.068	0.053	0.547	0.530	0.334
Adjusted R^2	0.066	0.050	0.545	0.518	0.331
F Statistic	34.598*** (df = 6; 2854)	19.178*** (df = 6; 2048)	316.846*** (df = 6; 1577)	43.942*** (df = 6; 234)	114.069*** (df = 5; 1139)
Significance:					*p<0.1; **p<0.05; ***p<0.01

The findings mainly align with those of Al Hawaj and Buallay (2022), who investigate the impact of ESG on ROA across various sectors globally, with particular focus on Asia and the United States. Their study identifies a statistically significant positive association between ESG and ROA in the manufacturing and retail sectors, which closely corresponds to the industrials and consumer goods sectors classified in this paper. Another consistent result is that they find no statistically significant relationship between ESG and ROA in the information technology and telecommunications sectors, which can be compared to the services sector used in this study. Furthermore, in line with this study, Al Hawaj and Buallay (2022) find a statistically significant negative relationship between ESG and ROA in the financials sector. The only deviation from the findings of Al Hawaj and Buallay (2022) relates to the energy sector. In this study, no statistically significant relationship

between ESG and ROA is observed in the energy sector, whereas Al Hawaj and Buallay (2022) report a statistically significant positive relationship between these variables.

The result of the negative relationship between ESG and CFP in financials sector is inconsistent with Shen and Wu (2013), who find evidence of positive ESG-ROA relationship in the banking industry. However, as their research period is from 2003 to 2009, the outcomes of the studies may not be reliably comparable, as their study period ends before the beginning of the research period used in this study. A more recent study by Bătae et al. (2021) explores the impact of ESG on CFP by separately examining the effects of the environmental, social, and governance pillars for European banks over the period 2010-2019. Their findings indicate that both corporate social responsibility and corporate governance quality negatively affect ROA, while only environmental management has a positive impact on ROA. Consequently, these results suggest at least a partial alignment with the findings of Bătae et al. (2021).

The findings are partially inconsistent with Andersen and Bams (2022), who reveal a statistically significant negative influence of ESG on ROA within the industrials sector. However, they identify a positive correlation between ESG and ROA in the competitive category, which corresponds to the consumer goods category used in this study. Nevertheless, comparability of the results may be limited as the industry groupings used by Andersen and Bams (2022) do not follow the GICS classification. Instead, industries are grouped based on correlations between, for example, environmental commitment, outcomes, firm size, and financial performance. This could lead to significant discrepancies, for example, their "industrials" sector may differ substantially from the "industrials" sector used in this study.

The reliability of the results presented in Table 12 are assessed using the robust standard errors approach. When applying the robust standard errors method, the impact of ESG on ROA shows no differences in coefficients compared to the Pooled OLS method, except

within the consumer goods category. Specifically, under the Pooled OLS method, the effect of ESG on ROA is observed to be 0,02 percentage points at the 1% significance level, whereas with the robust standard errors method, the significance level decreases to 5%. Overall, the results derived from the robust standard errors method show minimal deviations from those derived from the Pooled OLS method, thereby suggesting that the findings in Table 12 can be considered as reasonably reliable.

Table 13 presents the results of the relationship between ESG and Tobin's Q across different industry categories, derived with equation (6). The results reveal a significant negative relationship between ESG and Tobin's Q in services and financials sector. Specifically, holding all other factors equal, a one-unit increase in the ESG score results in 0,6 percentage points decrease in the company's market value relative to the book value of its assets in these two categories. For the remaining industry categories, no statistically significant relationship between ESG and Tobin's Q is detected.

Table 13. Industry analysis - ESG-Tobin's Q

	Dependent variable:				
			Tobin's Q		
	Industrials	Services	Consumer Goods	Energy	Financials
ESG score	0.002	-0.006***	0.0003	0.007	-0.006***
	(0.001)	(0.002)	(0.002)	(0.007)	(0.002)
Lagged Tobin's Q	0.269***	0.306***	0.269***	0.070	0.322***
	(0.018)	(0.022)	(0.025)	(0.070)	(0.028)
ROA	1.366***	0.571***	5.658***	0.684	4.556***
	(0.213)	(0.104)	(0.429)	(1.298)	(0.902)
Size	-0.090***	-0.074***	-0.107***	-0.091**	-0.065***
	(0.011)	(0.018)	(0.019)	(0.044)	(0.016)
R&D	2.899***	1.146***	3.087***	-41.183***	N/A
	(0.776)	(0.280)	(1.061)	(10.904)	
Leverage	-0.184	-0.918***	0.017	0.362	1.510***
	(0.134)	(0.150)	(0.188)	(0.616)	(0.165)
Beta	-0.079**	0.043	-0.298***	0.355	-0.087*
	(0.039)	(0.062)	(0.056)	(0.227)	(0.051)
Constant	1.013***	1.753***	1.608***	-0.107	0.167
	(0.192)	(0.270)	(0.253)	(1.271)	(0.278)

Observations	2,861	2,055	1,584	241	1,145
R^2	0.139	0.231	0.401	0.135	0.417
Adjusted R^2	0.137	0.228	0.398	0.109	0.414
F Statistic	65.863*** (df = 7; 2853)	87.736*** (df = 7; 2047)	150.766*** (df = 7; 1576)	5.193*** (df = 7; 233)	135.712*** (df = 6; 1138)

Note: *p<0.1; **p<0.05; ***p<0.01

Consistent with the ESG-ROA relationship, the results of the ESG-Tobin's Q relationship exhibit similar patterns to the findings of Al Hawaj and Buallay (2022). They identify a statistically significant, negative relationship between ESG and Tobin's Q within the telecommunications & information technology sector and the financials sector. As previously mentioned, the telecommunications & information technology sector used by Al Hawaj and Buallay (2022) corresponds to the services sector in this study. Consistent with the findings of the Table 13, Al Hawaj and Buallay (2022) do not observe a statistically significant relationship between ESG and Tobin's Q in the energy sector. A difference from Al Hawaj and Buallay's (2022) study is observed in the industrials and consumer goods sectors, where they report a statistically significant, positive relationship. In this study, although the coefficient for the ESG variable is positive for these industry groups, it is statistically insignificant. Nonetheless, the results broadly align with those reported by Al Hawaj and Buallay (2022). Certain divergences from their findings were expected, considering that their research focuses on the United States and Asia, whereas this study examines European companies.

Again, the reliability of the results presented in Table 13 are assessed using the robust standard errors approach. The results obtained through the robust standard errors method do not exhibit significant differences compared to those from the Pooled OLS method. The distinctions in the ESG score coefficients between the Pooled OLS model and the robust standard errors method are observed in the services and financials categories, where the significance of ESG's impact on Tobin's Q decreases from 1% to 5% when using the robust standard errors method. However, the results derived from the robust standard errors method remain largely consistent with those obtained through

the Pooled OLS method, thereby suggesting that the findings in Table 13 can be considered reasonably reliable.

In summary, it is evident that ESG positively impacts profitability in the industrials and consumer goods sectors, although no statistically significant impact on market valuation is observed in these industry categories. Within the energy sector, ESG does not exhibit significant influence on either profitability or market valuation based on the results. In the services sector, while no statistically significant effect on profitability is identified, ESG demonstrates a negative impact on market valuation. The least favorable association between ESG and CFP is observed in the financials sector, where ESG adversely affects both profitability and market valuation.

The favorable effect of ESG on ROA observed in the industrials sector may arise from the positive impact of ESG measures on energy efficiency and environmental risk avoidance, which in the long run can lead to improved profitability (Hennigs & Kilian, 2014). The services sector encompasses companies that are probably heavily dependent on their human capital (Hennigs & Kilian, 2014). ESG initiatives thus likely involve investments in employee well-being and engagement, the effects of which may not necessarily be reflected in the company's financial performance in the short term. However, according to Deng et al. (2013), this can positively affect the company's financial performance in the long term. Consequently, the influence of ESG on ROA and Tobin's Q may not be apparent in this study, even though improvements in ESG performance may have subsequent positive effects on CFP in the services sector.

In the energy sector, ESG measures often strongly relate to the environment, such as the use of renewable energy sources and reducing carbon footprint, which can reduce risks and costs in the long term. Similarly to services sector, the potential subsequent positive effects on CFP may not be apparent in this study, since this study focuses on the immediate effects of ESG scores on CFP. Furthermore, according to Andersen and Bams (2022), companies operating in the energy sector typically face substantial capital expenditures,

making investments in environmentally friendly projects costly. This may offset any potential benefits derived, for instance, from energy efficiency, in the short term.

In the consumer goods sector, a positive relationship between ESG and ROA is observed. According to Andersen and Bams (2022) in this industry group, actions toward ESG improvements are often more visible to customers than in other industries. This involves initiatives such as product labels that communicate sustainability practices. In such cases, comparing the sustainability of products becomes straightforward, and the selection of ESG-aligned alternatives is easier. This presents a significant contrast, for instance, to the services sector, where ESG initiatives might primarily focus on enhancing employee well-being, thus making it more challenging for outsiders to identify ESG efforts. Consequently, within the consumer goods sector, customers who prioritize ESG initiatives can effortlessly identify ESG-friendly companies and support their products. According to Andersen and Bams (2022), responsible products are likely to enhance a company's reputation and increase customer satisfaction, thus creating a competitive advantage for businesses.

The financials sector, in which negative relationship between ESG and CFP is observed, predominantly encompasses banks and financial institutions. As suggested by Shen and Wu (2013), socially responsible banks tend to issue fewer subprime loans and charge lower interest rates to customers, potentially reducing the revenue. Additionally, the findings of Bătae et al. (2021) suggest that enhanced product responsibility decreases profitability in the banking sector. According to their perspective, in the banking sector, risk-taking tends to yield higher short-term returns. Given that aspects such as corporate social responsibility and good corporate governance are often linked to decreased risk-taking and a more conservative portfolio management approach, improvements in ESG often result in decreased profitability (Bătae et al., 2021).

Next, the sectoral differences are analyzed by categorizing industries into ESG-sensitive and non-sensitive sectors, as proposed in the section 5.2. In ESG-sensitive model, materials serves as a reference industry, and in non-sensitive model, communication services is used as a reference industry. The results of the Table 14 reveal an asymmetric impact of ESG on CFP across these two industry categories. Specifically, the results indicate a statistically significant positive association between ESG and ROA within ESG-sensitive industries, whereas this relationship lacks significance in non-sensitive sectors. In ESG-sensitive sectors, a one-unit increase in ESG score corresponds to 0,1 percentage point rise in ROA. Regarding the relationship between ESG and Tobin's Q, a positive association is observed in ESG-sensitive industries, contrasting with a negative relationship in non-sensitive industries. Holding other variables constant, a one-unit increase in ESG score results in 0,2 percentage points increase in Tobin's Q within ESG-sensitive industries, and conversely, 0,4 percentage points decrease within non-sensitive industries.

Table 14. ESG-sensitive industries

	Dependent variable:			
	ROA		Tobin's Q.	
	ESG-sensitive	Non-sensitive	ESG-sensitive	Non-sensitive
ESG score	0.001^{***}	0.00003	0.002^{*}	-0.004^{***}
	(0.0001)	(0.0001)	(0.001)	(0.001)
Lagged ROA	0.078^{***}	0.192^{***}	N/A	N/A
	(0.022)	(0.013)		
Lagged Tobin's Q	N/A	N/A	0.214^{***}	0.325^{***}
			(0.022)	(0.012)
ROA	N/A	N/A	0.953^{***}	0.663^{***}
			(0.223)	(0.085)
Size	-0.001	0.005^{***}	-0.058^{***}	-0.075^{***}
	(0.001)	(0.001)	(0.015)	(0.009)
R&D	-0.034	-0.085^{**}	11.266^{***}	0.203
	(0.154)	(0.037)	(1.602)	(0.241)
Leverage	-0.098^{***}	-0.045^{***}	0.011	-0.100
	(0.016)	(0.013)	(0.161)	(0.086)
Beta	-0.034^{***}	-0.004	-0.201^{***}	-0.065^{**}
	(0.004)	(0.005)	(0.043)	(0.032)
Energy	-0.011^{*}	N/A	-0.197^{***}	N/A
	(0.006)		(0.061)	
Utilities	-0.020^{***}	N/A	-0.221^{***}	N/A

	(0.005)		(0.047)	
Consumer Discretionary	N/A	0.026***	N/A	0.115**
		(0.008)		(0.055)
Consumer Staples	N/A	0.047***	N/A	0.433***
		(0.008)		(0.051)
Financials	N/A	-0.014	N/A	-0.596***
		(0.008)		(0.057)
Health Care	N/A	0.091***	N/A	0.719***
		(0.009)		(0.058)
Industrials	N/A	0.029***	N/A	0.112**
		(0.008)		(0.049)
Information Technology	N/A	0.048***	N/A	0.454***
		(0.009)		(0.059)
Real Estate	N/A	0.026**	N/A	-0.243***
		(0.011)		(0.075)
Constant	0.081***	-0.053***	0.460*	1.233***
	(0.025)	(0.020)	(0.256)	(0.132)
Observations	2,157	5,979	2,157	5,979
R^2	0.093	0.093	0.177	0.473
Adjusted R^2	0.089	0.091	0.174	0.472
F Statistic	27.429*** (df = 8; 2148)	46.777*** (df = 13; 5965)	51.361*** (df = 9; 2147)	382.982*** (df = 14; 5964)

Significance: *p<0.1; **p<0.05; ***p<0.01

As with the previous results obtained from the Pooled OLS models, the reliability of the results presented in Table 14 is verified using the robust standard errors approach. The robust standard errors model diminishes the significance of the ESG-ROA relationship in non-sensitive industries, where the statistical significance of the coefficient decreases to 10%. Additionally, the positive relationship observed between ESG and Tobin's Q in ESG-sensitive industries loses statistical significance, while in non-sensitive sectors, the significance of this relationship decreases to 5%. After the robustness check, the results persist in indicating a positive association between ESG score and ROA in ESG-sensitive industries, and a negative relationship between ESG score and Tobin's Q in non-sensitive sectors.

Overall, the results of the industry analysis reveal significant variations in the relationship between ESG and corporate financial performance across different sectors. Thus, the findings align with the third hypothesis, suggesting an asymmetric relationship between ESG and CFP across industries. Consistent with the Hypothesis 4, the results indicate a

more favorable association between ESG and CFP in ESG-sensitive industries than in non-sensitive industries. The results align with Gonçalves et al. (2018) and Chen et al. (2023), who find more pronounced positive association between ESG and CFP in environmentally sensitive industries.

One proposed explanation for the asymmetric ESG-CFP relationship is the perception that enhancements in ESG practices within environmentally sensitive industries are considered as critical and necessary, and thus ESG investments made by these companies leads to acknowledgment and rewards from stakeholders (Gonçalves et al., 2018). However, ESG investments in non-sensitive industries may not be viewed as equally essential, potentially resulting in a weaker impact on the company's CFP. Instead, these actions may be perceived primarily as increased costs for the company, resulting in a negative relationship between ESG and CFP (Borghesi et al., 2014). As noted from the descriptive statistics section of this study, industries categorized as ESG-sensitive tend to exhibit higher average ESG scores. This divergence may arise from their heightened sensitivity to environmental risks compared to non-sensitive industries, which forces them to promote ESG initiatives and disclose ESG information to demonstrate responsibility to stakeholders (Hennigs & Kilian, 2014). This observation aligns with legitimacy theory, which suggests that companies seek to maintain or enhance their legitimacy in the eyes of key stakeholders (Palazzo & Scherer, 2006).

6.4 Summary of the results

The Table 15 summarizes the results in relation to the hypotheses formulated in the study. Each result is interpreted statistically significant if the coefficient of the variable achieves statistical significance at least at the 10% level. According to the results, H_1 is accepted, as in both Pooled OLS and fixed effects models the coefficient is positive and statistically significant. H_2 is rejected, as both models detect a statistically significant negative coefficient. Given the statistically significant and divergent findings observed in the industry analysis, H_3 is accepted. Finally, the findings suggested a more favorable

relationship between ESG and CFP in environmentally sensitive industries, thereby H_4 is accepted.

Table 15. Summary of the results

	Hypothesis	Result
H_1	*ESG score has a positive impact on return on assets in European companies.*	Accepted
H_2	*ESG score has a positive impact on Tobin's Q in European companies.*	Rejected
H_3	*The relationship between ESG and CFP is asymmetric between different industries.*	Accepted
H_4	*The value creating effect of ESG is stronger in ESG-sensitive industries.*	Accepted

In summary, the results reveal an asymmetric impact of ESG on CFP. While the results indicate a positive impact of ESG on profitability, the impact on market valuation is negative. However, the metrics used for CFP are fundamentally different: One is an accounting-based measure, relying on historical figures of a company's performance, while the other is market-based, incorporating forecasts of future developments. For this reason, the metrics may present contrasting narratives regarding the impact of ESG on CFP. Furthermore, it is important to acknowledge that while the results demonstrate statistical significance, their practical implications are marginal. Pooled OLS and fixed effects models estimate that a one-unit increase in ESG score corresponds to 0,02 and 0,1 percentage points increase in profitability, respectively. Correspondingly, the results indicate that a one-unit increase results in 0,3 percentage points decrease in Tobin's Q.

The sector-specific analysis underscored the importance of industry in influencing the relationship between ESG and CFP. The findings revealed that the most favorable relationship between ESG and CFP was observed within the industrials and consumer goods sectors, whereas the least favorable relationship was identified within the financials sector. Moreover, the results suggest that within industries identified as ESG-sensitive, such as energy, utilities, and materials, investments in ESG have a more favorable impact on CFP compared to non-sensitive industries. The results indicate that in industries where

ESG investments are perceived as critical, ESG improvements have a more significant positive impact on profitability. Similarly, an emphasized positive ESG-profitability relationship is also observed in industries where ESG investments are prominently visible to customers and other external stakeholders. However, within the financial sector, where ESG investments primarily aim at improving social and governance responsibilities, the impact of ESG on profitability is adverse. ESG is found to have a negative influence on market value in non-sensitive industries, particularly in the services and financial sectors. In these sectors, ESG improvements may be viewed primarily as increasing costs, leading to a negative effect on the company's market value (Borghesi et al., 2014).

7   Conclusions

The primary objective of this study was to explore the influence of ESG performance on corporate financial performance, as measured by ROA and Tobin's Q. Furthermore, the study aimed to assess how this influence varies across different industries. ESG scores provided by Refinitiv served as a proxy for evaluating ESG performance. The study utilized data from listed companies in European Union member states over the period from 2012 to 2022, employing Pooled OLS and fixed effects models.

The study revealed findings suggesting that the impact of ESG on CFP varies depending on the metric used to assess CFP. The results indicate a positive effect of ESG on profitability, whereas its influence on market valuation is negative. Moreover, the findings reveal variations in the effects of ESG on CFP across different industries. Particularly robust positive effects of ESG on profitability were observed in ESG-sensitive industries, as well as in sectors where ESG improvements are evidently perceivable from the perspective of external stakeholders. Conversely, the study observed that a negative impact of ESG on market valuation is evident in non-sensitive industries, with services and financial sectors exhibiting particularly strong effects. In summary, the results indicate a more favorable relationship between ESG and CFP in ESG-sensitive industries. In reference to legitimacy theory, this may be due to higher pressure on ESG-sensitive industries to enhance their ESG performance to be perceived as more acceptable by stakeholders. Because improvements in ESG performance are perceived as more critical in these industries, the positive impact of ESG on CFP is more pronounced in them.

The results of the study provide valuable insights into the relationship between ESG factors and CFP for publicly listed companies in European Union member states. The study reveals intriguing findings, particularly regarding sector-specific differences, which have not been in the focus of previous studies on European companies. The European Union is a pioneer in many aspects of ESG-related advancements, and ESG actions are no longer merely voluntary but have become part of EU regulation. A recent example of increased ESG regulation in the EU is the Corporate Sustainability Reporting Directive (CSRD),

which came into effect at the beginning of 2023. The CSRD strengthened regulations and expanded the scope of reporting requirements to include a broader range of companies.

The results underscore that for European companies, prioritizing ESG, particularly in ESG-sensitive industries, can have a significant positive impact on a company's financial performance. Conversely, the findings also indicate that while ESG investments are crucial, their impact on financial performance may not always be positive. Especially in non-sensitive industries, ESG investments may often lead to adverse effects on CFP. However, this study focused on analyzing the short-term effects of ESG, implying that potential positive impacts emerging over the longer term are not reflected in the results.

Although this thesis contributes to the existing literature, there are some limitations and settings that remain to be investigated. First, this thesis examines the relationship between ESG and CFP with linear models. Ma and Yasir (2023) suggest that the relationship between ESG and CFP may follow an inverted U-shape, rather than linear line. In future, this relationship could be examined with a non-linear model to identify the possible asymmetric effects of ESG on CFP. Moreover, the long-term effects of ESG on CFP could be analyzed by including a lag of ESG score as the independent variable. It is possible that the implications of changes in ESG, especially on ROA, which is based on historical figures, become evident over time. Therefore, it could be beneficial to include the first lag of the ESG score as an independent variable, particularly for accounting-based measures. Furthermore, examining the impacts of ESG separately for each pillar—environmental, social, and governance—on a sector-by-sector basis could provide valuable insights into which ESG actions are most critical within each industry. Additionally, in the future, it would be meaningful to explore the underlying drivers of the asymmetric relationship between ESG and CFP across different sectors.

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