

Effect of ESG-scores on the Financial Performance of companies from Sensitive Industries.



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Abstract

In recent times, companies face immense pressure from society to enhance their practices while also adhering to the increasing regulations and standards set by governments to promote sustainability. The term ESG, which stands for environmental, social and governance has become widely used as a measure of assessing the corporate responsibility of companies. Various studies have tried to investigate the impact of ESG on the financial performance of companies which yielded positive, negative, and neutral results. Despite these findings, drawing conclusions has proven challenging. Moreover, much of the research has concentrated on several industries as a whole rather than focusing on few industries, thus, creating a gap in existing literature. This study seeks to explore how ESG-scores influence the financial performance firms from top four ESG sensitive industries from S&P 500 which are energy, industrial, healthcare, and automotive.

To measure the firm performance, the study uses financial ratios of companies which include return on equity (ROE), net margin (NM), and operating margin (OM). The relationship between the ESG-scores and the mentioned financial ratios are investigated using a regression analysis. The time period selected for the study is ten years (2013-2022). This quantitative study uses secondary data collected from Refinitiv Eikon.

The findings from the regression analysis show a very weak positive correlation among ESG scores and the financial ratios while the relation between ROE and ESG-score is statistically insignificant. Quite a few factors can be in play which are influencing the results, however, as the relationship is very weak, a concrete conclusion cannot be reached from this study regarding the connection between financial performance and ESG scores.

Preface

This master thesis is submitted to fulfill the prerequisites for the degree of Master of Science in Economics and Business Administration with a specialization in Finance at Aalborg University.

The primary focus of this thesis is to explore the effect of ESG scores on the financial performance of companies operating in the sensitive industries, such as energy, industrial, healthcare, and automotive. The main motivation behind choosing this topic was the ever-growing importance towards sustainability and additional curiosity to gain more insights on this topic.

I am profoundly grateful to my supervisor, Frederik Steen Lundtofte, for providing constant guidance and valuable insights on my research. Without his knowledge and valuable feedback, this thesis would have been harder to complete. I also express my gratitude to AAU Business School for providing exceptional levels of academia in the past two years.

Table of Contents

1. Introduction	6
1.1 Problem discussion	7
1.2 Research question	8
1.3 Scope and delimitations	8
1.4 Thesis structure	9
2. Background of ESG	9
2.1 Definition of ESG	9
2.1.1 Environmental factor (E)	10
2.1.2 Social factor (S)	10
2.1.3 Governance factor (G)	11
2.2 Socially responsible investing	12
2.3 ESG Standards and Screening Techniques	14
3. Theoretical Framework	15
3.1 Shareholder Theory	15
3.2 Stakeholder Theory	16
3.3 Legitimacy Theory	18
3.4 Resource-based View	19
4. Literature Review	19
4.1 Corporate social responsibility, socially responsible investing and ESG	20
4.2 ESG and Financial performance	22
4.2.1 Positive relationship	22
4.2.2 Negative relationship	22
4.2.3 Neutral relationship	23
4.3 Industry-specific ESG discussion	24
4.3.1 Energy sector	24
4.3.2 Industrial sector	24
4.3.3 Healthcare sector	25
4.3.4 Automotive sector	25
4.4 ESG rating weaknesses	26
5. Data	27
5.1 Region	27
5.2 Time horizon	27
5.3 Time lag	27
5.4 ESG scores and financial data	27

5.5 Data preparation and filtering	28
6. Methodology	29
6.1 Research paradigm	29
6.2 Hypotheses	30
6.3 Variables	30
6.3.1 Dependent variables	31
6.3.2 Independent variable	32
6.3.3 Control variables	32
6.4 Regression model	33
7. Results and analysis	35
7.1 Descriptive statistics	35
7.2 Correlation matrix	36
7.3 Model diagnostics	36
7.3.1 Linearity	36
7.3.2 Autocorrelation	37
7.3.3 Multicollinearity	38
7.3.4 Heteroscedasticity	38
7.3.5 Normality	39
7.4 Empirical results from regression	41
7.5 Analysis	43
7.5.1 ESG score vs ROE	44
7.5.2 ESG score vs NM	45
7.5.3 ESG score vs OM	46
7.5.4 Comparison of findings with previous literature	46
8. Theoretical analysis	47
8.1 Shareholder theory	47
8.2 Stakeholder theory	47
8.3 Legitimacy theory	48
9. Weaknesses	49
10. Conclusion	49
10.1 Truth criteria	50
10.1.1 Reliability	51
10.1.2 Validity	51
10.1.3 Generalizability	52
10.2 Theoretical contributions	52
10.3 Practical contributions	52

10.4 Ethical considerations	52
11. Further research	53
12. References	54
13. Appendix	62

1. Introduction

ESG factors, which include environmental, social and governance aspects have become increasingly important, to investors, lenders, and SRI analysts in recent times. Prioritizing ethical investments is now a focus for those involved showing a shift towards long term sustainability goals rather than just focusing on maximizing profits. Research suggests that incorporating ESG performance into business strategies can help reduce risks and lead to returns though the outcomes may differ depending on the industry and country. The emphasis on ESG strategies has risen alongside the growing need for transparency and sustainability in the business world. The establishment of the Principles for Responsible Investing (PRI) by the UN in 2006 was a milestone that underscored the significance of ESG practices through reports and initiatives. These practices are not viewed as a way to improve performance but also to support the well being of all stakeholders. With an increasing emphasis on sustainability effectively implementing ESG principles has become vital, for investors, policymakers, and society as a whole.

In recent years, there has been a notable rise in the scrutiny of firms' corporate social performance (CSP), accompanied by a substantial uptick in the reporting of sustainability and corporate performance (Gillan, Koch, & Starks, 2021). According to a study, by the DWF Group that surveyed 480 executives across eight sectors there is a growing pressure on companies to address environmental, social and governance (ESG) issues (DWF, 2021). A sustainability report published by KPMG points out that 96% of the worlds 250 companies have been consistently reporting on sustainability since 2011 with the percentage never falling below 90% (Threlfall, King, Shulman, & Bartels, 2020). Moreover, the report indicates that 80% of a sample of 5,200 companies, including the revenue earners, from 52 countries are actively engaged in reporting on sustainability.

According to data from the worldwide Global Sustainable Investment Alliance, worldwide sustainable investments surpassed \$35 trillion in 2020, indicating a growth from the \$22 trillion reported in 2016.. ESG score investing, rooted in socially responsible investing (SRI) involves considering the social and environmental impacts of companies when taking investment decisions. SRI has a history dating back to the 18th century but gained prominence in the later part of the 20th century due to concerns about environmental degradation and social inequality (CFI, 2023). In the recent times there has been a growing emphasis on ESG investing as more investors incorporate ESG factors into their decision-making processes. This shift is driven by

an increased awareness of the risks and opportunities related to ESG issues along with advancements on instruments for evaluating the ESG performance of a firm (CFI, 2023).

Though sustainability is receiving more and more attention, the question of how ESG impacts a company's financial performance is still up for debate. In an effort to address this subject, a number of past researchers have discovered positive, neutral, and negative relationships. There has been a growing body of research in more recent literature that indicates contrasting results, but no agreement has been achieved. However, most of the research were conducted on broad scale across several industries or focused on single industries. In 2015, the Intergovernmental Panel on Climate Change found that all firms do not bear equal responsibility for all of the emissions they create. Sensitive industries—those marked by moral controversy, societal taboos, and political pressure—are more likely to harm the environment and society. The amount of environmental information disclosed in financial reports is influenced by a number of criteria, including industry classification, according to earlier research (Patten, 2002).

This thesis attempts to bridge the previously mentioned literature gap by offering a deeper comprehension of the ESG – financial performance link as well as practical advice for practitioners, including investors and companies creating CSR programs.

A simple linear regression will be used in the study to analyse the correlation among ESG scores and financial performance of firms from sensitive industries. Three financial ratios which include return on equity (ROE), net margin (NM) and operating margin (OM) are representatives of the financial performance metric in this study. The study will present the results from three regression models for the three financial ratios and attempt to provide more in depth knowledge into the relationship between firm financial performance and ESG.

1.1 Problem discussion

The background illustration shows how the business climate is changing to emphasize ESG. Wider market patterns of growing sustainability initiatives in recent years show the changes. But is ESG financially advantageous for businesses which are sensitive to ESG issues? Is it better for company performance, specifically?

According to (Friede, Busch, & Bassen, 2015)'s meta-study, there is a positive relationship in the majority of cases and a non-negative relationship in 90% of them. However, (Orlitzky, Schmidt, & Rynes, 2003) Orlitzky et al. (2003) state that the association between ESG and FP is still unclear, leaving need for more investigation.

As previous studies got mixed and weak results while investigating the effect of ESG on firm performance for whole market, this thesis will solely focus on industries which are sensitive to ESG issues.

1.2 Research question

Considering the aforementioned, objective of this thesis is to provide further insight into the relationship between ESG and FP within the top four industries in the U.S which are sensitive to ESG outcomes. As a result, the following research question has been formulated:

‘How ESG scores affect the financial performance of firms from sensitive industries?’

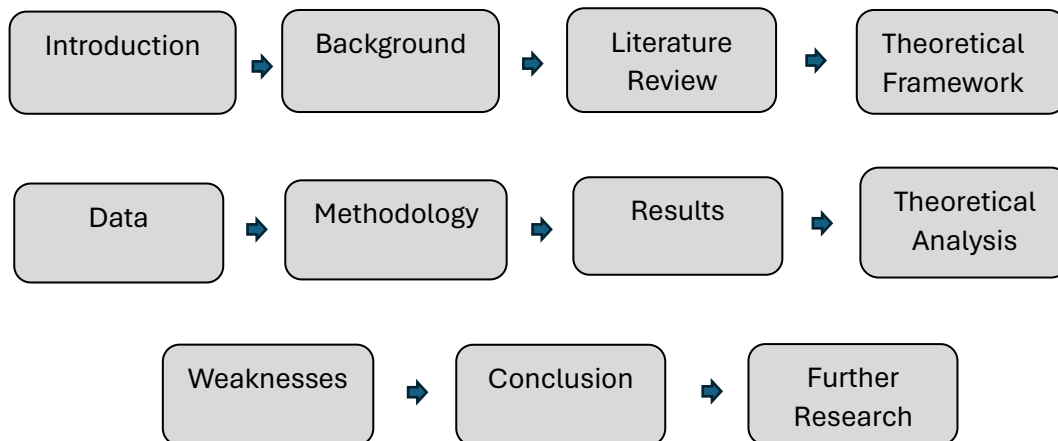
The decision behind choosing sensitive industries was mostly due to the lack of previous research on the same subject. Previous research mostly focused on many industries and didn't adjust for industry affiliation effects (Moore, 2001). I believe focusing on few industries with similar sensitivity to ESG issues might yield a new perspective. Moreover, Moore (2001), in his study found significant difference in ESG related issues and ESG engagement between industries. A company's offerings and how they run their operations can influence the perception of the public and other stakeholders towards that company. For instance, the oil sector often faces scrutiny and government regulations compared to the fashion or technology sectors. Sensitive industries are those with businesses that have a major negative influence on society and the environment.

1.3 Scope and delimitations

The purpose of the thesis is to explain how ESG ratings affect the financial performance of firms across four sensitive sectors. Defining the thesis's boundaries or specifications is required in order to meet that scope. The thesis's limits make sure that the research is manageable, targeted, and narrow enough to provide results that are pertinent to the research issue.

The thesis is restricted to analysing just the firms from S&P 500 between 2013 and 2022. The time frame was selected since there wasn't as much data accessible in previous years or the most recent concluded year. Moreover, just firms that are publicly listed on the applicable stock markets are examined. The businesses had to have publicly available data in order for financial data to be gathered, which is why only publicly listed enterprises were included.

1.4 Thesis structure



The thesis will adhere to the format shown above in order to address the research topic. The research issue that forms the basis of the thesis will be addressed after a brief introduction in the first part. The first portion will also include the thesis's scope and delimitation. After that, there will be a section with the background of what is ESG along with socially responsible investing. The literature review of the past studies regarding the subjects of ESG and firms financial performance are going to be covered in section three while section four will depict the theoretical framework. The procedures for retrieving and processing the data will be further explained in the following section. The methodology section then explains the research paradigm, hypotheses, variables used in the study, and what assumptions underlie the ordinary least squares method. Additionally, an introduction to the models utilized in the studies to look into the research topic will be provided. The model diagnostics, results of the regressions and the analysis will then be examined in section seven. In section eight, a theoretical analysis will be provided. Weaknesses that are thought to affect the outcome will also be examined. Finally, a conclusion will be reached along with recommendations for more study.

2. Background of ESG

2.1 Definition of ESG

ESG is the process of making investment decisions by taking into account not just financial considerations but also environmental, social, and governance concerns. In the 1960s, socially conscious investment gave rise to the long-standing ESG movement. The word "ESG" first appeared in the middle of the 2000s, and throughout the past ten years, it has grown significantly. These days, the fastest-growing investment categories are SRI and ESG. ESG and socially responsible investment are sometimes used interchangeably; however, ESG is

distinct as it is a quantifiable instrument. Aligning ideals and ethical considerations are the most common reasons for implementing ESG (MSCI, 2023).

2.1.1 Environmental factor (E)

The first factor of ESG metric, environmental, examines a company's approach to managing risks minimizing its impact and promoting environmental sustainability. Businesses, with strong practices are typically well regarded by investors and stakeholders who value sustainability and responsible environmental management. It considers factors, such as:

1. Carbon Footprint and Greenhouse Gas Emissions; Companies are judged based on their efforts to reduce carbon emissions and their overall impact on the environment. This includes steps like boosting energy efficiency shifting to renewable energy sources and embracing carbon offset programs (MSCI, 2023).

2. Energy Efficiency and Use of Energy; Assessing a company's energy consumption patterns and efforts to enhance energy efficiency is vital here. Embracing energy sources like wind power along with implementing technologies that save energy are seen as positive actions within this category (MSCI, 2023).

3. Waste Management and Recycling; Having waste management strategies and recycling programs play a role, in reducing environmental harm and encouraging resource conservation. Companies are evaluated based on their waste reduction initiatives, recycling rates and adoption of waste disposal practices (MSCI, 2023).

4. Water Usage and Conservation; Given that water is a resource how companies manage water usage and conservation practices is closely scrutinized. Efforts to lower water usage adopt water saving technologies and back conservation projects in regions, with water resources are crucial (MSCI, 2023).

2.1.2 Social factor (S)

When it comes to the social aspect of ESG the focus lies on how a company handles its influence treats its employees and stakeholders and contributes to societal well being. Companies that exhibit such practices are often positively perceived by investors and stakeholders who prioritize ethical business behaviour, social responsibility, and a beneficial impact, on society. Important factors and considerations include:

1. Labor Practices and Working Conditions; Companies are evaluated based on how they treat their employees covering work practices, working conditions and employee rights. This

encompasses aspects like pay, benefits, health and safety standards well as efforts to combat workplace discrimination and harassment (MSCI, 2023).

2. Employee Diversity, Equity and Inclusion; Diversity, equity and inclusion (DEI) play a role in responsibility. Companies are judged on their initiatives to enhance diversity and inclusion within their workforce, management team and organizational culture. This involves programs for recruiting and retaining a staff fostering inclusive work environments and ensuring opportunities for all employees (MSCI, 2023).

3. Community Involvement and Philanthropy; Companies are evaluated on their engagement with communities well as their contributions towards societal betterment, through philanthropic endeavours volunteer initiatives and community development projects. This entails supporting education, healthcare services, environmental conservation efforts and other social causes (MSCI, 2023).

Human Rights and Supply Chain Management: In the realm of rights and supply chain management businesses undergo assessments based on their dedication to upholding labor practices and standards concerning human rights, across their supply chains. This involves monitoring and addressing risks related to rights combating forced labor and child labor and advocating for fair labor practices among suppliers and business partners (MSCI, 2023).

2.1.3 Governance factor (G)

The governance aspect of ESG focuses on how a company's managed, governed and controlled to ensure responsibility, transparency, and ethical behaviour. Sound governance practices are often well received by investors and stakeholders who value management, ethical leadership and efficient oversight. Companies with strong governance frameworks are better equipped to handle risks and make wise decisions. Generate long term value, for shareholders and supporters. Important factors and considerations include:

1. Board diversity and structure; Companies are reviewed based on the makeup and diversity of their board of directors. This involves looking at factors, like gender, ethnicity, skills, experience and the independence of board members. Having a diverse and independent board is often viewed positively as it brings perspectives and ensures oversight (MSCI, 2023).

2. Executive Compensation and Incentives; Companies are assessed on how they compensate their executives, including whether executive pay aligns with company performance and shareholder interests. This assessment considers the use of performance-based incentives how

transparent companies are about compensation and efforts to prevent inappropriate pay (MSCI, 2023).

3. Transparency and Disclosure Practices; Transparency and disclosure play a role in establishing trust with investors and stakeholders. Companies undergo evaluation based on how transparent they're in their reporting corporate disclosures and interactions with shareholders. This includes providing accurate and comprehensive information about the company's performance, risks involved, strategic direction as well as governance practices (MSCI, 2023).

4. Ethical Business Practices and Anti Corruption Policies; Companies are judged on their dedication to behaviour, integrity standards well, as anti corruption policies. This involves putting in place and enforcing codes of conduct ethical policies and measures, against corruption to prevent bribery, fraud and other unethical behaviours within the organization (MSCI, 2023).

5. Risk Management and Internal Controls; Companies are evaluated on their ability to identify, assess, and handle risks effectively. This entails implementing risk management processes, internal controls, and governance structures to lessen financial and strategic risks. Effective risk management is vital for protecting the company's assets, reputation, and long-term sustainability (MSCI, 2023).

2.2 Socially responsible investing

SRI is a type of investing strategy that takes sustainability aspects including environmental, social, and governance (ESG) into account in addition to risk and return. SRI, which is frequently used interchangeably with phrases like impact investing, ethical investment, and sustainable investing, can be thought of as an umbrella word for sustainable investing methodologies. The motivations behind SRI can be attributed to social preferences, social signalling, and the belief that SRI can mitigate risks not accounted for in traditional investment strategies, thereby reducing portfolio risk (Riedle & Smeets, 2017; Saci, Jasimuddin, & Hasan, 2022). Additionally, studies have shown that socially responsible investments are not only driven by ethical considerations but are also rationally motivated (Hakenes & Schliephake, 2021).

While the debate on the financial performance of SRI compared to conventional investments continues, research indicates that socially responsible funds generally perform as well as or

better than traditional funds (Gutsche & Zwergel, 2020). A meta-analysis of numerous studies has been conducted to explore the relationship between SRI and financial performance, aiming to determine if incorporating corporate social responsibility and ethical concerns in portfolio management is more profitable than conventional investment strategies (Revelli & Viviani, 2014).

SRI is evolving beyond a mere financial strategy, with investors increasingly seeking to align their investments with their socio-ethical and environmental-ecological considerations (Wieland, 2021). This shift is reflected in the growing demand for impact investing, which actively seeks to make a positive impact through investments in socially beneficial organizations or enterprises with sustainable practices (Slyusarenko, Vasylchuk, & Sadoenko, 2019). The rise of SRI has led to the diversification of capital markets, where socially responsible investing is becoming a significant and distinct segment (Michalczuk & Konarzewska, 2020).

The figure below shows sustainable investing dating back from 1995 to 2022. The surge in ESG incorporation over the years is clearly evident. According to Statista Research department, the U.S. market owned around half of the global sustainable investment assets in 2020. Moreover, at the beginning of 2022, 497 institutional investors, 349 money managers, and 1,359 community investment institutions controlled \$7.6 trillion in assets with US domiciles. These investors practiced "ESG incorporation," which is the use of different ESG factors in their portfolio selection and investment decision-making (USSIF, 2022).

Sustainable Investing in the United States 1995–2022

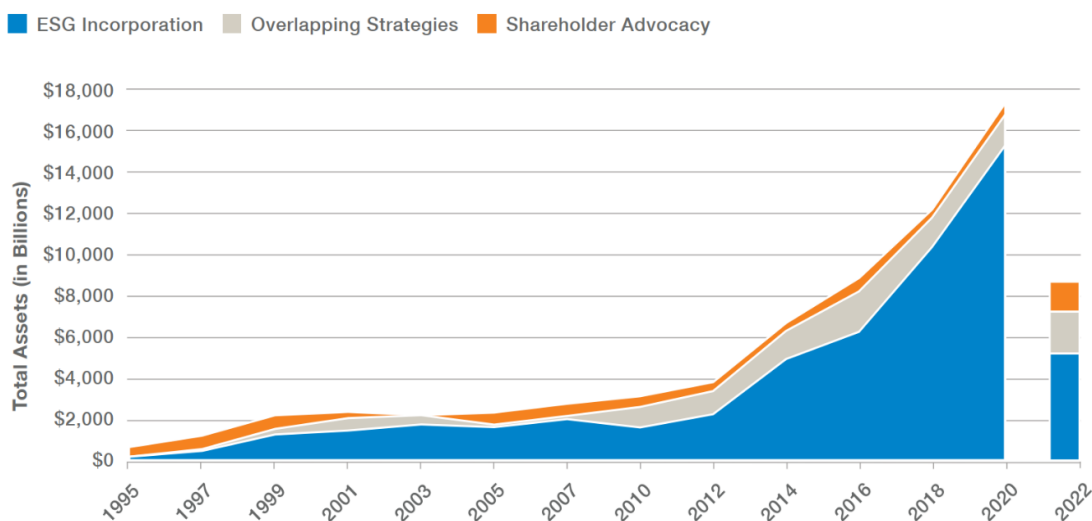


Figure 1: Sustainable investing in U.S (1995-2022)

2.3 ESG Standards and Screening Techniques

The three main components that are used to assess and measure a business's efforts towards sustainability and social impact are known as ESG criteria. The three ESG pillars encompass a wide range of variables that may be quantified to assign a sustainability score to businesses (Investopedia, 2024). The environmental criteria assess how a company's activities affect the environment, including the air, land, water, and other ecosystems. The ability of a business to sustain positive connections with its many stakeholders—suppliers, clients, staff, and society at large—is measured by social criteria. Corporate policies and the organization's governance, which includes the board of directors and management, are examined by governance criteria (Investopedia, 2024).

Comparatively speaking to SRI, the ESG investment strategy is fairly new. The UN Global Compact report "Who Cares Wins" incorporated ESG for the first time in 2004 (Kell, 2018). The United Nations gave a convincing justification for ESG investment when it created the concept of ESG:

'Investment success ultimately hinges on a thriving economy, which in turn depends on a robust civil society, which in turn depends on a sustainable Earth. Therefore, investment markets have a clear self-interest in the long run to support improved environmental and social impact management in a way that promotes the sustainable growth of a global society. It is in the best interests of all market participants to incorporate environmental, social, and corporate governance (ESG) considerations more fully into investment choices as this will eventually lead to more stable and predictable markets.' (Compact, 2004)

Screening strategy can be either positive or negative. Positive screening refers to the practice of giving preference to businesses that exhibit traits that align with the investor's ideals. The specifics of the screening process will rely on the investor's interests, but generally speaking, positive screening consists of things like supporting minorities, anti-pollution initiatives, and employee relationships. In contrast to positive screening, negative screening is the process of excluding particular businesses or even whole industries if they don't meet the sustainability standards set by investors. Investors that want to steer clear of "sin stocks," such those in the alcohol or tobacco industries, employ this kind of approach..

Investing in businesses that are leaders in a certain area, such as an industry, is the best-in-class strategy. With this method, the top-performing businesses or assets in the selected category are either picked or given a higher ranking based on their sustainability. The best-performing businesses are now being determined by ESG standards. ESG investment promotes investing

in firms that are comparatively better than other industry participants, as opposed to negative screening, which excludes whole sectors. Companies that demonstrate the most initiative in meeting the ESG criteria that are most relevant to their business are rewarded through ESG investment.

3. Theoretical Framework

According to stakeholder theory, agency costs may be decreased by taking into account the interests of all parties impacted by a firm's choices, including debtors, employees, vendors, local communities, and the broader public (Freeman, 1984). On the other hand, according to shareholder theory, firms should put interests of their shareholders first since including other stakeholders in decision-making may reduce shareholder value. (Friedman, 1962). Another theory named the legitimacy theory, talks about how societal behaviour and business legitimacy are related. Resource-based view also provides some input regarding the connection within sustainable practices and a firm's financial performance. These concepts provide a basis for comprehending the relationship between financial performance and ESG scores.

3.1 Shareholder Theory

In the book "Capitalism and Freedom " by Milton Friedman (1962), initially proposed that companies have a duty to maximize shareholder wealth. He later introduced the shareholder theory in a 1970 in an article stating that managers serve as representatives, for shareholders and are loyal to them (Friedman, 1970). Friedman also says that people should take responsibility for their social actions rather than businesses doing so.. He argues that when businesses allocate funds to projects that do not benefit shareholder value, they impede shareholders ability to make their spending decisions. According to Friedman this undermines the core principles of a society. Moreover, he emphasizes that addressing issues is the governments responsibility and support, for society should come from taxes or voluntary organizations than corporations.

Mcclure, Spry, & Coelho (2003) echo Friedman's perspective, arguing that social responsibility initiatives go against the capitalism's moral and practical tenets. They argue that firms with societal accountability exacerbate the agency problem, increasing the likelihood of misconduct and immoral behaviour. Both Friedman (1962) and (Mcclure, Spry, & Coelho, 2003) assert that the stakeholder theory lacks clarity on how managers should address ethical responsibilities. Additionally, Mcclure, Spry, & Coelho (2003) posit that the fiduciary duty to shareholders should take precedence over all other obligations for agents. Brown & Smith,

(2006) assert that when firms allocate funds to socially responsible endeavours without generating shareholder profit to offset these costs, it creates agency costs. These acts represent agency costs since the shareholders lose out on opportunities while the agent's wealth grows. Mansell (2013), however, provides convincing proof that companies may uphold the moral standards of shareholder theory while pursuing stakeholder interests without diminishing shareholder value.

After being introduced the shareholder theory has come under fire due to scandals. Critics argue that executives, tasked with maximizing shareholder value and motivated by incentives may resort to tactics to achieve their goals (Smith, 2003). Post (2003) suggests that the shareholder theory lacks safeguards against abuse of power by executives allowing them to pursue their interests without checks. Furthermore, skeptics argue that the approach favors immediate financial gain above long-term sustainability (Smith, 2003). In their critique of the shareholder theory, Fontrodona & Sison (2006) note that although investors in enterprises incur risks and hope for rewards, they may lessen these risks by diversifying their holdings. On the other hand, workers who experience job insecurity in the event that their firm files for bankruptcy.

Smith (2003) contends that few criticisms of the shareholder theory stem from misinterpretations of its principles. According to the theory, the pursuit of profit maximization should be conducted within the bounds of the law and without resorting to deceitful practices. Executives involved in financial scandals, who violated laws and caused harm, did not adhere to the tenets of the shareholder theory. In certain cases, managers received bonuses despite shareholders facing losses, indicating that these executives prioritized their own interests over those of the shareholders.

The company's prosperity is the primary concern of shareholders. They want their investment to be successful, just like any other investor. Depending on the findings, I think that the theory may help explain some of the results. Assuming that the findings show a negative correlation between financial performance and ESG ratings, then, according to this notion, companies shouldn't aim for high ESG ratings since doing so will hurt the company's shareholders.

3.2 Stakeholder Theory

Freeman (1984) emphasizes a view of responsibility suggesting that companies should not only focus on shareholders interests but also meet the needs of all parties involved. This approach involves taking into account the concerns of suppliers, customers, employees and other relevant stakeholders to ensure long term sustainability and prosperity (Freeman & Mcvea, 2001).

According to Freeman (1984) there is a relationship, between businesses and stakeholders, as stakeholders and society thrive so do businesses emphasizing the significance of dealing stakeholder issues. For instance, if stakeholders show reluctance in interacting with a company its ability to thrive becomes increasingly challenging.

Renneboog, Horst, & Zhang (2008) propose that by following the stakeholder theory companies should aim to strike a balance in meeting stakeholders' interests in a way that optimizes the well being of both businesses and stakeholders. Freeman & Mcvea (2001) propose that utilizing an analytical framework that considers the interrelationships among the firm, different groups, and individuals influenced by the business can enhance the likelihood of effectively addressing the associated challenges.

Wijnberg (2000) discusses three approaches, in the stakeholder theory: descriptive, instrumental, and normative. The descriptive approach focuses on assessing if stakeholders' priorities are taken into account while the instrumental approach looks into how stakeholders influence a business's performance. The normative approach emphasizes the importance of managers prioritizing stakeholder relationships and explores why it's crucial to take stakeholder interests into account. Furthermore, the author suggests that understanding a manager's political standpoint within a company to Aristotles view on citizens in society can improve the effectiveness of the normative stakeholder theory in addressing issues. A study by Margolis & Walsh (2003) emphasize the significance of the stakeholder approach as a framework for explaining corporate social responsibility performance and the link within social and financial performance.

On the other hand, some critics question the stakeholder theory, according to Jensen (2010) a key concern is that managers might misuse funds they control to promote their interests in an attempt to enhance relationships, with stakeholders. This problem becomes more problematic when there is uncertainty about how the company should engage with its stakeholders making it difficult to evaluate how resources are allocated for stakeholder interactions. Ultimately this ambiguity can lead to outcomes for both society and the company resulting in what's known as an agency cost. Additionally, Henderson (2001) points out that another issue stemming from engaging in stakeholder activities for the sake of compliance can lead to increased expenses, decreased revenues and investments, in low return projects that would otherwise be turned down.

The core idea of the theory suggests that companies should prioritize the well being of all parties involved than solely focusing on shareholders. Since businesses depend on a variety of stakeholders, for their sustenance it is crucial for them to be mindful of how their actions are viewed by the market and stakeholders as this can significantly impact the success of the company. This study suggests that this theory can help shed light on stakeholders' perceptions of ESG scores to some extent. It is likely that the company will gain from high ESG ratings if they are advantageous to the stakeholders, as evidenced by increased better financial performance ratios.

3.3 Legitimacy Theory

According to Suchman (1995) it is essential for businesses to align with norms, as part of legitimacy theory. Adhering to these norms can help establish legitimacy for a business. Legitimacy is perceived as the actions of an entity being desirable, proper or appropriate within a constructed system of norms, values, beliefs and definitions (Burlea-Schiopoiu & Popa, 2013). This theory explains how corporate management responds to societal expectations. Firms and relevant stakeholders are seen as part of a group that follows its morals and principles which expected from all who are part of this group. It implies that businesses will modify their methods and approaches in order to get accepted and live up to community standards. (Wilmshurst & Frost, 2000). Legitimacy is significant for companies because of their involvement in the community. Firms depend on stakeholders whose support and acceptance are critical for its longevity.

The reason why companies choose to participate in ESG initiatives might be to conform to expectations or standards. It may be also viewed as means by which businesses try to gain reliability, within society acting as a sort of agreement. However, there is a concern that some companies may only engage in ESG activities for the sake of gaining approval from society.

I think this concept will offer insights into my findings and help draw conclusions. The environment in which various companies operate is likely to shape their decisions. Regardless of the outcome aiming for ESG ratings could be worthwhile if it aligns with what the community values. If a strong ESG rating does indeed enhance a company's credibility in society's view, it's likely that people will be more open to interacting with business, which might have a beneficial impact on its success.

3.4 Resource-based View

The theory known as the resource-based view (RBV) emphasizes the importance of a company's resources and capabilities in gaining competitive advantage and achieving better performance (Clulow et al., 2003). According to RBV, for a firm to maintain a lasting advantage it needs resources that're valuable, rare, inimitable, and non-substitutable (referred to as VRIN resources). In this framework practices related to environmental, social and governance (ESG) can be viewed as VRIN resources.

ESG practices have received a lot of attention because they are considered assets that can give a company a competitive advantage. These activities are beneficial as they can boost a company's image, minimize risks, and attract stakeholders (Oh-Suk & Han, 2023). Not all companies fully incorporate ESG considerations into their plans and operations making these practices somewhat rare. The uniqueness stems from the fact that ESG practices are deeply ingrained in a company's culture and procedures making it challenging for competitors to imitate them. Lastly ESG practices offer advantages that cannot be easily replaced by resources or strategies.

Incorporating ESG practices as VRIN resources can have a significant impact on a company's competitive edge and financial outcomes. Businesses that effectively utilize ESG practices can set themselves apart from rivals, become appealing to socially conscious consumers and investors and establish strong relationships with stakeholders according to research by Shaddady & Alnori (2024).

Moreover, incorporating ESG principles can act as a business strategy, for managing risks enabling businesses to reduce the impact of environment, social and governance related challenges on their business operations and financial performance (Y. Zhang et al., 2023). This proactive approach will allow companies to strengthen their adaptability and longevity in times of adversity like the COVID-19 crisis (Mulyono, 2023).

4. Literature Review

Renowned economist Milton Friedman wrote an influential article titled "The Social Responsibility of Business is to Increase its Profits" in (Friedman, 1970) that had a profound effect on professional and academic circles. In this article, a contrasting view to the growing concept of CSR was presented that was gaining popularity during that period. His main argument emphasized that businesses owe their allegiance to shareholders and owners

implying that pursuing objectives is not, within their rightful scope. According to Friedman's perspective businesses should prioritize maximizing profits while upholding obligations and ethics (Friedman, 1970).

Contrastingly in 1972, a notable research study called "Choosing Responsible Stocks " exploring the link, between corporate social responsibility (CSR) and financial success was conducted by Moskowitz. By choosing 14 companies renowned for their dedication to responsibility Moskowitz demonstrated that these companies' stocks outperformed well known market benchmarks like the DJIA. These results led to the discovery of a connection, between corporate social responsibility and share performance (Moskowitz, 1972). This seeming paradox sparked a growing field of inquiry that has since flourished and evolved considerably over the years.

Contrastingly, in his article titled "The End of ESG", Alex Edmans argues that ESG holds critical importance while also being nothing out of the ordinary. He suggests that ESG elements play a role in creating long term value and should be incorporated into the strategy of any company rather than being relegated to a niche area. Edmans stresses that although the significance of ESG cannot be denied it should not be seen in isolation from business practices. Instead, it should be recognized as a component of business strategy influencing every aspect of corporate governance and performance (Edmans, 2023).

4.1 Corporate social responsibility, socially responsible investing and ESG

The ideas surrounding Corporate Social Responsibility (CSR), Socially Responsible Investing (SRI) and Environmental, Social and Governance (ESG) play a role, in understanding how business, society and the environment intersect. CSR involves a company's dedication to operating in social and environmental aspects. Meanwhile SRI focuses on investment strategies that balance gains with social or environmental impacts. On the hand ESG comprises a range of criteria used by investors to assess corporate behaviour and predict the future financial performance of companies.

Studies have demonstrated a correlation between ESG performance, and the financial success of manufacturing firms as highlighted by Zahroh & Hersugondo (2021). Likewise, there is evidence supporting the link between CSR initiatives and firm value (Chung et al., 2018). Furthermore, CSR is acknowledged as an approach to integrating environmental considerations into operations based on Zhang's work in (2021). A bibliometric analysis, on ESG research has

outlined the state and emerging trends in this area underscoring the increasing significance of ESG factors (X. Zhao et al., 2023).

SRI serves as a decision-making process aimed at maximizing profits while taking into account socio environmental factors as explained by Remlein (2021). SRI is increasingly gaining popularity, in the market indicating a growing interest in responsible investment practices (Michalczyk & Konarzewska, 2022). Market analyses show a rise in SRI in regions such as Europe and the United States (Wieland, 2021).

The importance of CSR lies in its function as a business model where companies strive to be accountable to stakeholders, society, and the environment beyond making profits (Kun-Hsiang, 2020). Additionally, research on CSR in China has been traced back to the 1980s, demonstrating its long-standing relevance in the business landscape (K. Wang & Sun, 2021). Moreover, the implementation of CSR as a trend followed by international corporations is reviewed, highlighting its widespread adoption as a key aspect of the ESG approach (Grishina et al., 2021).

Studies on involvement in governance and the impact of social capital on environmental issues highlight how social and environmental aspects are interconnected in governance practices, for sustainability purposes (Y. Wang et al., 2020; Yang et al., 2022) . Moreover, emphasizing responsibility, within the framework of a sustainable circular economy holds significant theoretical and practical value showing how CSR is adapting to environmental issues (Gong et al., 2021).

Companies have been making strides in disclosing their activities thanks, to both voluntary and mandatory agreements. One key voluntary effort is the United Nations Global Compact (UNGC) that urges companies to embrace socially responsible practices. These practices revolve around conducting business respecting rights maintaining fair labour standards promoting environmental sustainability and fighting corruption. They have laid down important principles that participating firms must adhere to. As per United Nations data (Impact, 2022) there are currently 22,117 participants from 162 nations dedicated to following these principles and submitting reports. The United Nations Foundation for Responsible Investment (UNGC) provides investors with information to integrate ESG considerations into their decision-making procedures and synchronize their tactics with the UNGC's improved ESG data reporting. (Impact, 2014).

4.2 ESG and Financial performance

4.2.1 Positive relationship

The link, between ESG (Environmental, Social and Governance) factors and the financial success of companies has been extensively studied. Research consistently reveals a positive connection between ESG practices and financial results. For instance, (C. Zhao et al., 2018) presented data supporting a correlation between ESG and the financial performance of Chinas listed power generation firms. Similarly, Kim & Li (2021) found that 90% of studies indicate relationships within ESG and company's financial performance with most showing a beneficial impact of ESG factors on corporate finances. Moreover, (Sandberg et al., 2022) noted that many studies in finance have identified a link between specific ESG categories and financial outcomes. This view is further reinforced by Morea et al. (2022) underscoring the effect of ESG initiatives on companies' financial performance. Additionally, Lei (2023) highlighted that the favorable influence of financial policies on corporate ESG performance is particularly significant for companies dealing with stricter financial constraints, higher agency costs and increased external pressures.

Five Dow Jones Sustainability indexes are analyzed in a research by Foglinao de Souza Cunha et al. (2019) on the impact of ESG on performance. These are contrasted with pertinent benchmarks using both traditional and contemporary portfolio indicators, spanning the years 2013 to 2018. Indices from developing markets, the US, Europe, and Asia-Pacific are used. Furthermore, a global standard index is utilized. The findings suggest that although there is still variation in the connection worldwide, many areas exhibit strong associations between risk-adjusted returns and sustainable investing. The globe, Europe, US, UK, and Spain indexes all show encouraging results.

Ademi & Klungseth (2022) also pointed out that investing in ESG related initiatives can enhance a companys ability to address challenges, in the future, which can have a positive influence, on its financial success.

4.2.2 Negative relationship

Another point of view contends that a negative relationship between firm financial performance and ESG can exist. Kalia & Aggarwal (2022) and Farooq (2015) both discuss how ESG practices can potentially harm a companys performance suggesting that such activities may lead to reduced profits and be seen as a disadvantage resulting in expenses. (Gavrilakis & Floros, 2023) and (Maama, 2021) present evidence indicating a correlation, between ESG

efforts and financial performance suggesting that lower ESG ratings could actually result in higher returns especially in the short run. In addition, studies by Shobhwani (2023) and Setiani (2023) also suggest a link between ESG scores and firm performance with the former revealing a significant adverse relationship with return on assets. Furthermore Puri (2022) underscores that the adverse impact of ESG on performance stems from the costs associated with ESG related initiatives for companies leading to financial disadvantages. Moreover, research conducted by S.-P. Lee & Isa (2022) discovered a connection between practices and financial outcomes among Korean businesses highlighting the intricate nature of how individual ESG ratings can influence financial results. These conclusions are further corroborated by studies like those of Ademi & Klungseth (2022) illustrating how engaging in ESG activities might have effects, on a company's standing.

4.2.3 Neutral relationship

While some studies have demonstrated a positive or negative correlation between ESG practices and financial outcomes, there is also a body of literature suggesting a neutral relationship between ESG and financial performance. Various research studies have shown perspectives on the connection, between ESG practices and financial results. While some suggest an negative link others propose a relationship between ESG and financial performance. (Alareeni & Hamdan, 2020) study delved into how corporate disclosure of ESG factors can influence firms operational, financial and market performance. Their findings indicated that these connections could be positive, negative or neutral implying that the impact of ESG practices on performance is not always straightforward. Additionally, (Broadstock et al., 2021) pointed out that strong ESG performance could reduce risk during crises hinting at a balanced relationship between ESG and financial outcomes in challenging economic times. Zehir & Aybars (2020) research looks at the performance of portfolios built using ESG ratings in Turkey and Europe. The relevant data is taken from Refinitiv Eikon database and covers the years 2004 to 2018. As benchmarks for performance measurement, the Fama & French three-factor model and the CAPM are employed. The research concludes that there is no correlation within firm performance and ESG. Another study by, Auer & Schuhmacher (2016) analyze SRI globally, taking into account the US, Europe, and Asia-Pacific. Sustainalytics provides ESG ratings based on a sample per month between August 2004 and December 2012. Additionally, they split their stock sample into industries and take into account each of the three ESG variables independently. Unlike previous research where the alpha is frequently utilized as a performance metric, the Sharpe Ratio is employed. According to their research, there is no overall

performance advantage to investing in ESG strategies in the US, Europe, or Asia-Pacific regions.

4.3 Industry-specific ESG discussion

4.3.1 Energy sector

The energy sector always faces increased scrutiny due to its environmental impact and associated ethical concerns. Companies within this industry are always being encouraged to share ESG information to tackle issues like unethical practices, social unrest, environmental harm, human rights violations, and corruption (Nuhu, 2023). ESG disclosure entails highlighting risks related to environmental impact, social practices and governance frameworks, emphasizing areas such, as energy usage, waste handling, pollution control and resource conservation (Siew, 2017).

Despite the energy sector being known for its attention to concerns, there is a lack of research on ESG performance specifically within this industry (Pineiro, 2023). However various studies have delved into the awareness, adoption rates and obstacles that energy companies encounter in implementing ESG practices. These studies underscore the significance of integrating ESG considerations into their day-to-day operations (Ratnasingam et al., 2023). One study shows that ESG performance can have a positive impact on the growth of companies in the Chinese energy sector (Hsiao et al., 2022). Researchers have also looked into how ESG factors affect performance across industries highlighting a significant influence on performance metrics in the energy industry (Nazarova & Lavrova 2022).

4.3.2 Industrial sector

The industrial sector comprises a diverse range of activities which include manufacturing and construction that plays a critical role in the global economy. Like the energy sector, the industrial sector also faces a lot of attention due to their way of operations. The supply chain complexity of this sector can make it challenging to adhere to high ESG standards, mainly due to global and multi-tiered suppliers. Moreover, innovation costs also make it quite difficult for firms in industrial sector to develop and implement sustainable technologies as this may pose substantial upfront investments. As a result, the construction sector has been evaluated very critically in terms of sustainability (Renukappa et al., 2012)..

While there are some challenges faced by the firms from industrial sector, the opportunities are immense. Implementing sustainable practices can help a firm to receive government incentives, such as grants or tax benefits. Moreover, such firm can differentiate themselves from their

competitors, attracting environmentally conscious customers and investors (Wassan et al., 2023).

4.3.3 Healthcare sector

The healthcare industry plays a vital role in ensuring public health and well being. ESG practices within this sector is crucial to enhance patient care, integrate sustainable practices and maintain ethical standards. In the context of the healthcare industry, the adoption of ESG practices is influenced by quite a few factors which include market forces, legislative requirements, and awareness, with companies complying with ESG requirements driven by perceived benefits and costs involved (Ratnasingam et al., 2023). However, there are quite a few challenges in implementing sustainable practices in this industry. Firstly, to maintain high ESG standards, the initial investment needs to be high as well, especially for smaller healthcare organizations with limited resources. Secondly, waste management is a huge issue in the healthcare sector. Proper disposal of toxic wastes is critical and highly regulated which makes it complicating to increase sustainability.

Research has shown that ESG activities is linked with improved firm performance, with certain components like corporate governance impacting the cost of capital and equity in the healthcare industry (Piechocka-Kaluzna, Tluczak, & Lopatka, 2021). Furthermore, integrating ESG practices in healthcare companies can substantially increase market-based performance and mitigate risks during uncertain times, such as the COVID-19 pandemic (Lin et al., 2023).

4.3.4 Automotive sector

The automotive sector has been placing increased emphasis on ESG initiatives to improve sustainability and overall effectiveness. The automotive sector encounters hurdles concerning ESG issues, which significantly affect facets of the industry. Studies indicate that ESG criteria impact supplier retention and executive pay management in this sector (Yeh et al., 2023). Additionally, researchers have delved into the correlation between ESG and firms from this industry, highlighting the significance of ESG ratings on financial performance and the value creation process (Dincă et al., 2022).

In the automotive industry, companies are embracing eco friendly approaches by creating hybrid and electric vehicles to lessen harmful effects on the environment and enhance long term viability. Sustainability within the sector extends beyond reducing environmental impacts; it also encompasses considerations of social and economic factors. Initiatives, like supply chain management and sustainable manufacturing practices have garnered interest as

effective measures to promote industry growth while reducing ecological footprints (Masoumi et al., 2019). Furthermore, this sector is exploring innovative approaches such, as a circular 3D printing system to recycle metal waste in order to promote circularity and sustainability within the manufacturing process (Nascimento et al., 2022).

4.4 ESG rating weaknesses

ESG ratings, which are often used to assess a company's commitment, to social and governance practices have some shortcomings that question their effectiveness. One key issue is the lack of transparency in how these ratings are calculated leading to discrepancies between rating agencies and causing confusion for investors and stakeholders (Ehlers et al., 2023). Furthermore, conflicts of interest within the ESG rating industry can compromise the impartiality and reliability of these ratings (Ehlers et al., 2023).

Another weakness of ESG ratings is the difficulty in determining the importance of ESG criteria considered during the rating process (López-García, 2023). This challenge in assigning weights to factors can result in inconsistencies in how companies are assessed based on their ESG performance. Additionally, disagreements among rating agencies, on defining ESG characteristics, attributes and standards contribute to the limitations of ESG ratings (Billio et al., 2021). The absence of an agreement, on what constitutes ESG elements may impede the consistency and trustworthiness of ESG ratings from organizations.

Moreover, studies have delved into the correlation between ESG ratings and weaknesses in controls revealing that companies, with internal controls often receive lower ESG ratings (Harasheh & Provasi, 2022). This indicates that the effectiveness of a company's internal control mechanisms can impact their ESG ratings underscoring the interconnected nature of governance, sustainability efforts and ESG performance.

One potential drawback of this research is the significant impact that the choice of rating provider has on the findings. The exclusion of some companies from our dataset may result from the restricted sharing of ESG data. Because data sharing is voluntary, companies who choose to provide information about the fundamental factors that determine an ESG rating are probably going to do well on these fronts. On the other hand, businesses that do poorly on these measures typically conceal their financial performance, which leads to an inherent bias in the data that is accessible. In the methodology and data description parts of the upcoming chapters, there will be a more thorough analysis of the ESG data.

5. Data

The data gathering and selection process, along with the rationale behind it, are explained in the part that follows. Firstly, the initial part introduces the region selection, time horizon and time lag decision. Secondly, data preparation and filtering process is given. Finally, the last part proceeds to outline the particular data that was gathered for the sample.

5.1 Region

The study conducted analyses the relationship between ESG scores and financial performance of companies from top 4 sensitive industries (Energy, Industrial, Healthcare and Automotive) in S&P 500. Most of the firms with an ESG rating on Eikon are situated in in the U.S. Furthermore, by selecting the U.S. region, the study is able to draw inferences about the most pertinent geographic area since it assesses the market with the largest value of all sustainable investment assets globally.

5.2 Time horizon

In this thesis, the primary study will be conducted over a ten-year period, starting from 2013 to 2022. Initially, it was decided to take a time frame of 15 years, however, due to data availability of ESG scores, the time span was shortened. Reducing the time period increases the risk of selection bias because it's likely that the sample doesn't fairly represent the population or the pertinent time period. The removed data may therefore exhibit unique traits or trends, which could introduce bias into the analysis of the relationship between financial success and ESG scores. As such, there's a chance the sample isn't entirely representative.

5.3 Time lag

Research, in the past has been limited when it comes to understanding how ESG impacts financial performance over time. Siemieniec's study in (2012) looked into this connection. Found a relationship when both ESG and FP were examined in the same year. However, no significant link was found when there was a one-year lag between measuring corporate social performance and corporate financial performance. This current study focuses on evaluating ESG scores, within the timeframe without considering any lag. In other words, ESG ratings are considered during the year they are released.

5.4 ESG scores and financial data

The review of existing literature highlights the varying choices of rating agencies, for collecting ESG scores. Some research suggests that the selection of an agency can impact the outcomes of studies. This thesis chooses to utilize data from Refinitiv Eikon as it offers ESG scores dating

back to 2013 ensuring coverage throughout the research period. The accessibility of Refinitive Eikon database via AAU facilities plays a role in this decision since Refinitiv can be easily accessed through this platform.

The ESG scores supplied by Refinitiv focus on evaluating a company's performance across environmental, social, and governance (ESG) criteria rather than solely measuring disclosure levels. These scores are well-suited for the measurement requirements of this thesis, as they encompass a wide array of attributes within each pillar. Refinitiv Eikon offers ESG ratings for over 9,000 publicly traded businesses globally, encompassing over 500 ESG metrics (Refinitiv, 2022). The 500 original data points are sorted according to industry relevancy by Refinitiv, which then reduces the number of data points to 186 per firm in a five-step procedure. The E, S, and G pillar scores are derived from the summation of these data points to provide ratings for 10 different categories. These pillar scores are combined to create the overall ESG score, which is then weighted according to the industry-specific factors (Refinitiv, 2022). On a scale of 0 to 100, where 100 is the greatest possible score and 0 is the lowest possible score, the scores are displayed.

The financial ratios used in this thesis are also collected from Refinitiv Eikon using the filter app inside the database. For certain companies, if the ratios were not directly available, they were obtained by collecting the relevant financial information needed to calculate them from the same database.

5.5 Data preparation and filtering

The collected data has been organised in an excel file and then imported to R, where the relevant quantitative analysis is performed. As mentioned earlier, the companies were selected from the top four sensitive industries from S&P 500 according to their market capitalization of their respective industries. The reason behind this selection were based on few factors:

Representativeness: The leading companies, within an industry often stand out as the frontrunners in terms of market dominance, revenue generation, innovation and overall impact. Delving into these companies offers insights into the prevailing trends, operational practices and strategic approaches that contribute to industry success.

Visibility of Trends: By directing attention towards the performing companies, researchers can readily interpret emerging trends, evolving patterns and best practices within the industry. These companies frequently establish benchmarks and norms that other businesses strive to follow making them significant subjects for research.

Availability of Data: Prominent companies typically make a wealth of data accessible including statements, disclosures, on corporate social responsibility (CSR), ESG scores and other pertinent information. This abundance of data streamlines analysis. As a result, it makes it easier to formulate sound conclusions.

A total of 40 companies were selected for this thesis which are illustrated in the table below:

Energy	Symbol	Industrial	Symbol	Healthcare	Symbol	Automotive	Symbol
Exxon Mobil	XOM	Caterpillar	CAT	Eli Lilly and Company	LLY	Tesla	TSLA
Chevron	CVX	Eaton	ETN	UnitedHealth Group	UNH	PACCAR	PCAR
ConocoPhillips	COP	Deere & Company	DE	Johnson & Johnson	JNJ	Ford Motor	F
Schlumberger	SLB	Illinois Tool Works	ITW	Merck & Co	MRK	General Motors	GM
EOG Resources	EOG	Parker-Hannifin	PH	Bristol-Myers Squibb Co	BMJ	Cummins	CMI
Phillips 66	PSX	Cintas	CTAS	Thermo Fisher Scientific	TMO	Genuine Parts	GPC
Marathon Petroleum	MPC	Emerson Electric	EMR	Abbot Laboratories	ABT	LKQ	LKQ
Pioneer Natural Resources	PXD	W. W. Grainger	GWW	Pfizer	PFE	BorgWarner	BWA
Occidental Petroleum	OXY	Johnson Controls Int	JCI	Amgen	AMGN	Aptiv	APTIV
Valero Energy	VLO	Dover Corp	DOV	Intuitive Surgical	ISRG	Autozone Inc	AZO

Figure 2: List of companies.

6. Methodology

This part of the thesis provides an over all picture of the methodology used in the research. First, the thesis-relevant research paradigm is introduced. Secondly, the variables and regression model is discussed. The final section covers model testing and lays out the assumptions for the regression model's reliability.

6.1 Research paradigm

In the field of education research there are generally three research paradigms: positivism, interpretivism and critical paradigms. This thesis focuses on exploring how ESG scores impact a company's financial performance by using measurable data. This approach aligns with positivism which emphasizes conducting experiments to analyze observations and answer questions (Kivunja & Kuyini, 2017). Therefore, this study follows this research philosophy to fill gaps in existing literature regarding ESG and financial performance. To answer the research question data is collected from sources and analyzed through regression techniques and carefully examined. As a result, this study adopts a deductive scientific approach. Conversely, an inductive approach is usually used when there is less prior research, on a topic, without any established theories to test against.

Furthermore, this research study uses a quantitative research approach as its primary method to answer the research question. The analysis is based on quantitative data, which includes numerical values, like ESG scores, financial data and ratios of firms. This approach is

considered suitable because a large sample size is needed to address the research question. Moreover, the quantitative method is preferred as it aims to test an existing theory than create ideas or theories. Additionally, the study utilizes secondary data rather than primary due to the abundance of reliable data sources available.

A qualitative research analysis is also presented later. This analysis will be in line with the shareholder and stakeholder theory discussed earlier to present a strong case for the relationship between ESG and financial performance.

6.2 Hypotheses

The connection between ESG scores and firm performance appears to be inconsistent. While high ESG scores might suggest that a company has undertaken significant environmentally friendly investments and internal changes, these actions can be costly and potentially reduce profitability. Such increased costs may prompt price hikes, which could strain customer relationships. Conversely, if this effect is reversed, a company might flourish as a result of a green transformation that ultimately enhances financial performance. Based on this, the following hypothesis have been formulated:

H0a- No correlation exists between ESG scores and ROE.

H1a- Correlation exists between ESG scores and ROE.

H0b- No correlation exists between ESG scores and NM.

H1b- Correlation exists between ESG scores and NM.

H0c- No correlation exists between ESG scores and OM.

H1c- Correlation exists between ESG scores and OM.

6.3 Variables

The research seeks to investigate how ESG scores affect financial performance measures. To do this, a regression analysis is used to understand the impacts of ESG scores, on these measures. The analysis involves dependent, independent and control variables. Multiple regressions are carried out to see how the independent variable affect the dependent variables, in each regression separately. Adding control variables helps make sure that outside factors don't skew the results of the regression analysis and strengthens the study's validity.

6.3.1 Dependent variables

Return on Equity:

The return, on equity (ROE) is a measure that shows how profitable a company is in relation, to the money invested by its shareholders. It is calculated by dividing the company's net income by the shareholders equity. Helps investors gauge how effectively the company is using its equity to make profits (Bach & Christensen, 2016). ROE is widely used by investors to assess a company's well being and performance (Colla et al., 2015).

ROE is a key measure of profitability, indicating the amount of profit a company has generated using shareholder equity (Timothy, 2022). Research has highlighted the significance of ROE in influencing firm value, showcasing the firm's capacity to generate net income from its equity (Adityaputra & Ariyanto, 2020).

Formula:

$$\text{Return on Equity} = \frac{\text{Net income}}{\text{Shareholders equity}} \times 100$$

Net margin:

Net margin, commonly referred to as profit margin (NPM) holds crucial importance for businesses as it reveals the portion of revenue that turns into profit after deducting all expenses. To compute this metric, you divide the profit after tax, by the net sales figure. Evaluating a company's efficiency in cost management and profit generation is a use of this metric (Balasubramanian et al., 2019).

Studies have highlighted that net profit margin serves not as a gauge of a company's financial performance but also influences various other financial measures. For example, researchers have utilized profit margin in conjunction with return on equity to assess performance (Arslan et al., 2014). Furthermore, there is evidence suggesting a correlation between profit margin and environmental cost disclosure among publicly listed companies underscoring its broader impact, on corporate transparency and sustainable practices (MADAWA & Frank, 2022).

Formula:

$$\text{Net Margin} = \frac{\text{Earnings after tax}}{\text{Net sales}} \times 100$$

Operating margin:

Operating margin is a critical measure for companies as it provides valuable insights into how effectively a company's main operations generate profits. To calculate it you divide the operating income by sales giving you an indicator of a company's profitability without factoring in interest and taxes (Rhodes et al., 2019).

Studies indicate that various factors influence the operating margin, including costs, efficiency in operations, market share and implicit interest payments (S. P. Lee & Isa, 2017). Operational costs have an impact on determining the operating margin highlighting the importance of managing costs and improving efficiency to enhance profitability (Maudos & Guevara, 2004). Moreover, elements such, as credit risk, market conditions and industry competition also affect the operating margin (Maudos & Solís, 2009).

Formula:

$$\text{Operating Margin} = \frac{\text{Operating profit}}{\text{Net sales}} \times 100$$

6.3.2 Independent variable

ESG score:

For our regression analysis I plan to use an ESG score that covers environmental, social, and governance aspects. This holistic ESG score takes into account controversies which are instances of media attention received globally to adjust the company's ESG performance based on the presence and seriousness of these controversies. It is important to include the controversy factor as it evaluates whether a company truly stands by its ESG commitments and aligns, with its perceived ESG performance. In our regression model I will denote the ESG score as "ESGscore."

6.3.3 Control variables

Debt ratio (DR):

I use debt ratio as a control variable in our study to forecast the impact of ESG-scores on our financial performance ratios. The debt ratio, which shows how much of a company's assets are funded through debt is important because it indicates the structure of a business. By adjusting for the debt ratio, we can better understand the impact of ESG factors, on financial performance

of firms without being influenced by variations in capital structure. Moreover, the debt ratio can be seen as an indicator of how a company manages risk. Companies with higher debt ratios may have different risk levels compared to those with lower ratios. Including the debt ratio as a control variable allows researchers to consider variations in risk appetite and exposure to risks, among companies.

Size (Log_TA)

The second control variable for this study is firm size which is determined by its total assets. It's common to factor in the size of a company as a control variable because bigger firms might have resources and skills to carry out ESG initiatives. Considering size ensures that any effects of ESG on performance aren't just due to differences, in the size of organizations. Larger companies may also possess managerial know how and governance structures, which could affect both their ESG efforts and financial results. By accounting for size researchers can accurately evaluate the distinct impact of ESG practices on financial performance regardless of organizational size factors.

6.4 Regression model

One method for examining the relationship between variables is regression analysis. The use of regression analysis particularly, Ordinary Least Squares (OLS) proves to be a useful method, for examining correlations among different disciplines. OLS is frequently applied to gauge the connections between variables by reducing the sum of squared residuals. This technique presupposes that the link between dependent variables is linear and that errors follow a normal distribution. In delving into links, OLS aids, in pinpointing the orientation and intensity of associations among variables. The basic assumptions of OLS regression are:

1. **Linearity;** The connection, between the dependent variable and the independent variables follows a linear pattern. This means that a one unit change in the results in a constant change in the dependent variable.
2. **Independence of Errors;** The errors (residuals) within the regression model are unrelated to each other. In other terms one error value does not rely on another error value.
3. **Homoscedasticity;** The variability of errors remains consistent across all levels of the variables. This assumption suggests that the residuals dispersion is uniform for all values of the independent variables.

4. Normality of Errors; The errors adhere to a normal distribution with a mean value of zero. While not mandatory for estimating regression coefficients, this assumption is crucial for hypothesis testing and confidence interval construction.

5. Absence of Perfect Multicollinearity; There are no linear relationships among the independent variables; none can be expressed as an exact linear combination of others.

6. No Autocorrelation; Errors do not exhibit correlation, with each other in time series analysis where observations might display temporal correlation.

It's crucial to consider these assumptions when working with OLS regression to ensure the accuracy and dependability of the estimates and statistical inferences. If these assumptions are not met it can result in biased parameter estimates, inefficient standard errors and flawed conclusions. Therefore, it's vital to evaluate how well these assumptions hold true in OLS regression analysis.

A simple linear regression analysis is the best option since we wish to investigate the relationship between one independent variable and one dependent variable in each model. The models used in the analysis considers fixed effects for year and firms, and robust standard errors. Fixed effects are important because the variables used in this study are collected over certain time and for specific companies, so it's vital to adjust for years and individual company influences. Moreover, fixed effects help us to adjust the impact of the Covid 19 pandemic on financial performance since it had a global impact on firms. By including fixed effect terms, we can account for how the pandemic affected our sample.

In our regression models we also incorporate robust standard errors to handle issues of heteroskedasticity. The formulas for our regression models, in this study are stated as follows:

Regression models:

$$ROE_{i,t} = \beta_0 + \beta_1 ESGscore_{i,t} + \beta_2 DRI_{i,t} + \beta_3 Log_TA_{i,t} + \beta_4 FE.\text{year} + \beta_5 FE.\text{firm} + \epsilon_{i,t}$$

$$NMI_{i,t} = \beta_0 + \beta_1 ESGscore_{i,t} + \beta_2 DRI_{i,t} + \beta_3 Log_TA_{i,t} + \beta_4 FE.\text{year} + \beta_5 FE.\text{firm} + \epsilon_{i,t}$$

$$OMI_{i,t} = \beta_0 + \beta_1 ESGscore_{i,t} + \beta_2 DRI_{i,t} + \beta_3 Log_TA_{i,t} + \beta_4 FE.\text{year} + \beta_5 FE.\text{firm} + \epsilon_{i,t}$$

Where,

Independent variable:

ESG score= The ESG-score

Dependent variables:

ROE = Return on equity

NM = Net margin

OM = Operating margin

Control variables:

DR = Debt ratio

Log_TA = Logarithm of total assets

FE.year = Fixed effects for year

FE.firm = Fixed effects for firm

 ϵ = Robust standard Errors

7. Results and analysis

The model diagnostics, empirical data, and descriptive statistics will all be presented in the upcoming chapter. Whether or not we reject the previously hypotheses will be discussed at the end of the chapter.

7.1 Descriptive statistics

Variable	Observation	Mean	Std. Dev	Min	Max
ESG score	400	63.64	16.11	9.37	91.06
ROE	400	0.20	0.28	-1.62	1.85
NM	400	0.09	0.12	-0.76	0.36
OM	400	0.14	0.11	-0.26	0.48
DR	400	0.61	0.17	0.11	1.24
Log_TA	400	10.59	0.49	9.38	11.57

Figure 3: Descriptive statistics.

Descriptive statistics of a dataset provide as overview of the central tendency, dispersion, and range of values for each variable. The total sample consists of 400 observations.

We can see from the table that the independent variable, ESG, has a large interval (9.37 to 91.06) along with a standard deviation of 16.11. This indicate that ESG scores of firms vary a lot over the years. As for the dependent variables and the control variables, the dispersion is moderate as seen by the lower standard deviation values.

7.2 Correlation matrix

	ESG	ROE	NM	OM	DR	Log_TA
ESG	1.00000000	0.12352599	0.12420013	0.14381666	0.08490297	0.57966834
ROE	0.12352599	1.00000000	0.34843755	0.33267951	-0.10290619	0.09510677
NM	0.12420013	0.34843755	1.00000000	0.76909574	-0.10100420	-0.01112857
OM	0.14381666	0.33267951	0.76909574	1.00000000	-0.10723603	-0.02422764
DR	0.08490297	-0.10290619	-0.10100420	-0.10723603	1.00000000	0.04283859
Log_TA	0.57966834	0.09510677	-0.01112857	-0.02422764	0.04283859	1.00000000

Figure 4: Correlation Matrix.

The correlation matrix shows most of the variables are not highly correlated with each other, except NM and OM, and ESG and Log_TA. The high correlation between NM and OM can be deemed understandable as the dataset consists of larger companies who often benefit from economies of scale which can lead to high net margins and operating margins due to cost efficiencies.

This high correlation among these two variables is not an issue as they are both part of different regression models. The high correlation among ESG and logarithm of total assets could have posed an issue with multicollinearity. However, later this issue was assessed by VIF analysis which will be discussed later.

7.3 Model diagnostics

7.3.1 Linearity

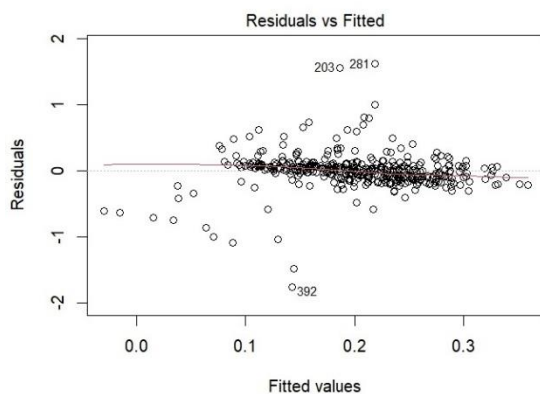


Figure 5: ROE Model.

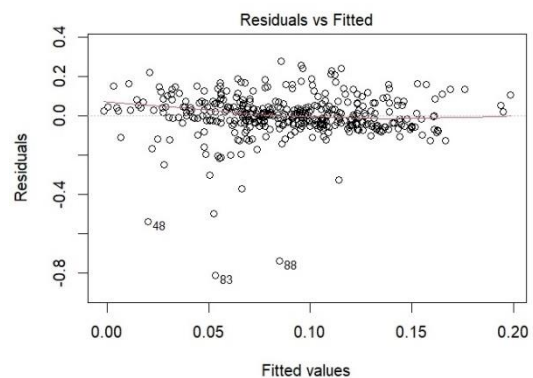


Figure 6: NM Model.

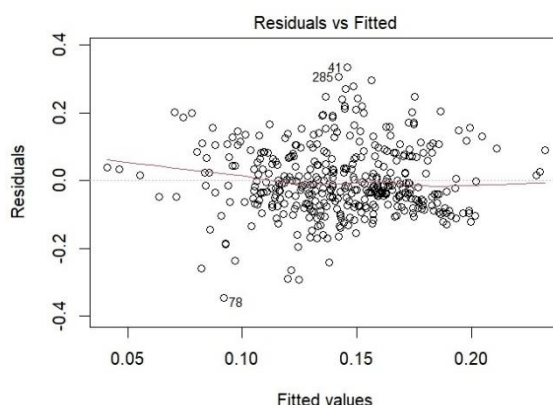


Figure 7: OM Model.

The above figures show the linearity plots for the three regression models. An ideal residual plot will show a random scatter around the horizontal line which will indicate that the residuals exhibit no systematic pattern and are randomly distributed. From the graphs, it is visible that the dataset does not show perfect linearity. Nonetheless, since the residuals are somewhat moving in a horizontal line, we can say there is no obvious divergence from linearity. As a result, it can be assumed that the assumption is satisfied and that there is a reasonably pleasing linear relationship.

7.3.2 Autocorrelation

ROE Model:

LAG	AUTOCORRELATION	D-W STATISTIC
1	0.7803497	0.4271961

NM Model:

LAG	AUTOCORRELATION	D-W STATISTIC
1	0.4092087	1.179131

OM Model:

LAG	AUTOCORRELATION	D-W STATISTIC
1	0.5002019	1.1364243

The dataset used in this study comprises time-series data containing both ESG scores and financial information. Since the study tracks the same companies across multiple years, it's

essential to assess whether there is any serial correlation, also referred to as autocorrelation, in the data. To examine the presence of autocorrelation, a Durbin-Watson test is conducted. The Durbin-Watson test statistic ranges from 0 to 4, where a value close to 2 will suggest no significant autocorrelation.

From the above figures, we can see that both the NM and OM model shows a D-W statistic which is closer to 2. This suggests no significant evidence of autocorrelation in the residuals of these two regression models at lag 1. However, the ROE model has a D-W statistic which is way below 2 suggesting autocorrelation. This issue has been handled by including fixed effect terms or dummy variables for specific year and firm in the regression models. Nevertheless, this didn't improve the regression results so no more additional modifications were made.

7.3.3 Multicollinearity

VIF-test				
ESG	DR	Log_TA	Year_indicator	Firm_indicator
1.647142	1.172342	1.609865	1.120132	1.284740

The values given show the outcome of a Variance Inflation Factor (VIF) test that checks for multicollinearity, among predictor variables in the regression model. VIF helps gauge how the variance of the predicted regression coefficients increases because of multicollinearity, among the predictor variables.

The VIF values are near 1 for all variables indicate that there is no perfect multicollinearity among the predictor variables in the regression model. This suggests that each predictor variable contributes unique information and does not heavily overlap with the information from predictors. As a result, the regression model is not greatly impacted by multicollinearity and the estimated regression coefficients are considered reliable.

7.3.4 Heteroscedasticity

ROE Model:

Breusch-Pagan test		
BP=95.248	df = 5	p-value < 2.2e-16

NM Model:

Breusch-Pagan test		
BP=7.5191	df = 5	p-value = 0.1848

OM Model:

Breusch-Pagan test		
BP=10.19	df = 5	p-value = 0.06773

The Breusch-Pagan test is conducted to check if heteroscedasticity is an issue for our regression outputs. The test results from NM and OM model show a p-value above the 5% threshold which means that there is no significant evidence of heteroscedasticity in the residuals of these two regression models. However, for the ROE model, the p-value is significantly below the 5% threshold which poses an issue of heteroscedasticity. To address this, robust standard errors was applied to the regression models, but it didn't improve the results.

7.3.5 Normality**ROE Model:**

Jarque-Bera Normality Test	
JB = 2794.2	p-value < 2.2e-16

NM Model:

Jarque-Bera Normality Test	
JB = 3733.8	p-value < 2.2e-16

OM Model:

Jarque-Bera Normality Test	
JB = 12.934	p-value = 0.001554

The above tables show the Jarque-Bera normality test for the three regression models. In order to satisfy the notion of normality, the p-value needs to be more than 5%. As we can see none of the models show p-values of over 5%. However, a visual approach was implemented to examine the residuals with a QQ-plot which is presented below. We can observe from the QQ-plot that there are some outliers present but an approximate normal distribution is present for all the factors. Consequently, it may be said that the normal distribution assumption is met.

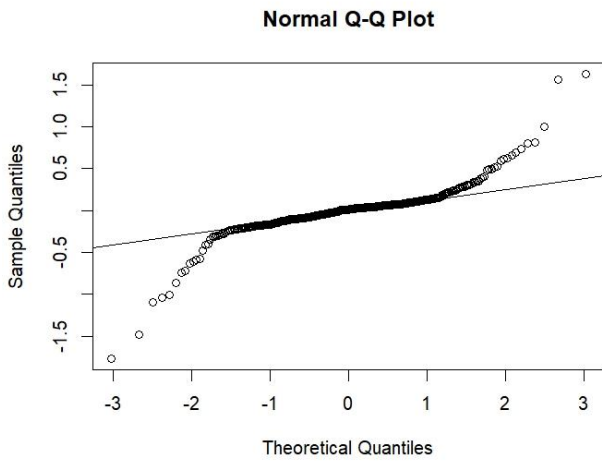


Figure 8: ROE Model.

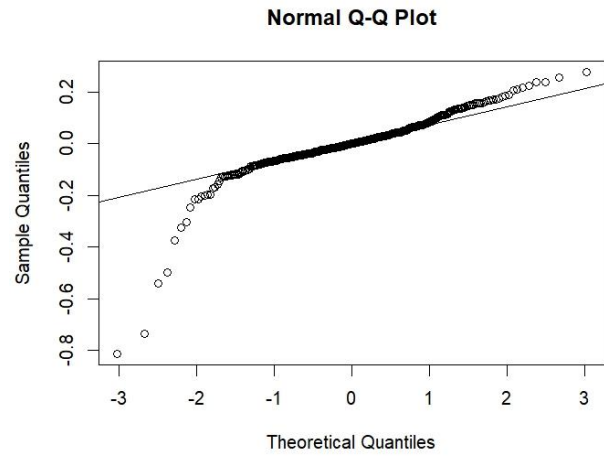


Figure 9: NM Model.

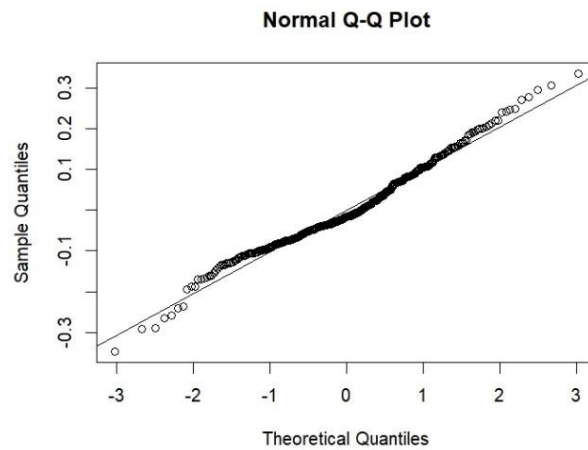


Figure 10: OM Model.

7.4 Empirical results from regression

ROE Model:

	Estimate	P-value
Intercept	-0.12329181	0.630786
ESG	0.00111836	0.104805
DR	-0.22206086	0.215724
Log_TA	0.02746567	0.394462

Multiple R-squared	Adjusted R-squared	P-value
0.05098	0.03894	0.0009245

The table above shows the regression results after adjusting for robust standard errors from the ROE model. The ESG coefficient stands at 0.00111836 hinting at a positive relationship with ROE. This means that one unit increase in the ESG score will lead to 0.00111836 units increase in ROE. However, it is not statistically significant at the 0.05 level (p-value=0.104805). This implies that there is some indication of a positive effect though not substantial enough to draw conclusions. The coefficient for DR (-0.22206086) shows a negative relationship with ROE which is also not statistically significant (p-value=0.215724). This negative relationship is understandable as high debt ratios means more debt which leads to higher interest expense. Interest payments reduce net income, and since ROE is calculated as net income divided by equity, a reduction in net income will eventually lower ROE. The coefficient of Log_TA is 0.02746567 which shows a positive but not statistically significant (p-value=0.394462) relationship.

The multiple R-squared value of 0.05098 indicates that approximately 5.1% of the variability in ROE is explained by the independent variable in the model. The adjusted R-squared value is also quite low at 0.03894. This suggests that the explanatory power of the model is relatively low.

Therefore, due to the insignificant and very low positive correlation between ESG score and ROE, the null hypothesis (H0a) cannot be rejected.

NM Model:

	Estimate	P-value
Intercept	0.11782179	0.2144
ESG	0.00148188	8.445e-05
DR	-0.14863663	4.708e-05
Log_TA	-0.00999492	0.2697

Multiple R-squared	Adjusted R-squared	P-value
0.1073	0.09602	1.513e-08

The regression results after adjusting for robust standard errors from the NM model are displayed in the above table. The ESG coefficient, which is 0.00148188, suggests that NM and ESG are positively correlated. Accordingly, a rise of one unit in the ESG score corresponds to a rise of 0.00148188 units in NM. This relationship is statistically significant ($p < 0.001$), indicating that higher ESG scores are associated with higher Net Margins. The small p-value (8.445e-05) confirms this strong significance. A negative correlation between DR (-0.14863663) and NM is also statistically significant (p-value = 4.708e-05). A somewhat negative association with NM is indicated by the coefficient for Log_TA, which is -0.00999492, although this link is not statistically significant (p-value = 0.2697).

The independent variable in the model accounts for 10.73% of the variability in NM, according to the multiple R-squared value of 0.1073. At 0.09602, the adjusted R-squared value is likewise quite low. This value is also relatively low, suggesting that the model explains a modest portion of the variability in NM.

Even if the association is modest, as the data imply, we may reject the null hypothesis (H0b) because of the significant relationship between ESG score and NM.

OM Model:

	Estimate	P-value
Intercept	0.32268986	0.0034199
ESG	0.00155923	8.225e-05
DR	-0.11761578	0.0007414
Log_TA	-0.02422152	0.0205548

Multiple R-squared	Adjusted R-squared	P-value
0.08164	0.06998	2.755e-06

The table above shows the regression results from the OM model after adjusting for robust standard errors. The ESG coefficient of 0.00155923 indicates a positive correlation between OM and ESG. Consequently, a one-unit increase in the ESG score is equivalent to a 0.00155923 unit increase in OM. The statistical significance of this link ($p < 0.001$) suggests that there is a positive correlation between higher ESG ratings and greater OM. This substantial significance is confirmed by the p-value (8.445e-05). Additionally, statistically significant (p-value = 0.0007414) is the negative correlation (-0.11761578) between DR and OM. The coefficient for Log_TA, which is -0.02422152, also indicates a negative correlation with OM. Like the previous two regression results, the multiple R-squared value for the OM model is at 0.08164 which means approximately 8.16% of the variability in OM can be explained by the independent variables. Similarly, the adjusted R-squared value also shows a low value of 0.06998.

Nevertheless, the model can still be considered statistically significant even though the explanatory power is modest. Because there is a positive link between ESG scores and OM, we can thus rule out the null hypothesis (H_0).

7.5 Analysis

The compiled literature shows contradictory results about the association between ESG-scores and financial performance of firms. (Friede, Busch, & Bassen, 2015) concluded that they found a positive relationship. On the other hand, (Gavrilakis & Floros, 2023) found a negative relationship among ESG and financial performance. (Zehir & Aybars, 2020) reported that they didn't find any correlation among ESG and firm performance. In our study, the results are also

mixed. The first regression model, between ESG score and ROE, shows a slight positive but insignificant relationship. Contrastingly, both the regression models for NM and OM show statistically significant relationships with ESG scores but the correlation is quite weak.

(Friede, Busch, & Bassen, 2015) declare that their outcomes are valid for certain markets, nations, and asset classes. So, different regions may show different relationships among ESG scores and financial performance. The influence of ESG factors, on the financial performance differs depending on the industry as well. Certain sectors might experience advantages from ESG ratings whereas others may not observe a direct correlation. As our data set only contains firms from certain industries, that could also be a reason for the results we got. The choice of country, for the study can also affect how ESG scores relate to financial performance of firms. U.S.A for instance places an emphasis on sustainability. In a society that prioritizes sustainability, products of companies with high ESG scores are likely to be preferred by consumers, which eventually benefits these companies. However, despite the importance of supply and demand in a company's success, the high costs associated with sustainability efforts may present challenges. While sustainable investments are anticipated to enhance performance in the term they may result in short term drawbacks. Another potential explanation for our findings could be related to the data collected and variables chosen. Various other factors could impact NM and OM without influencing ESG scores. Although data, from Refinitiv Eikon is widely recognized and used, it is not entirely error free.

7.5.1 ESG score vs ROE

As mentioned earlier, the analysis depicted there is a slight positive correlation between ESG scores and ROE. ESG considerations have become increasingly important worldwide as businesses move towards long term objectives rather than just prioritizing short term profits (C. Zhao et al., 2018). Stakeholders and investment managers suggest that companies, with ESG ratings often show improved financial performance and reduced company specific risks (Halid et al., 2023). This shift towards these behaviours is reflected in the connection between ESG ratings and financial indicators like return on equity. Furthermore, previous studies mentioned in the literature review indicate that high ESG of a company can impact its health and worth. Companies that score well on ESG criteria tend to receive fair valuations, are inclined to distribute dividends and encounter reduced capital expenses. Although fluctuations in ESG ratings may not have a direct impact on return on equity, the overall ESG performance positively influences a company's capital costs. This suggests that ESG considerations may play a role in shaping investor views and financial choices indirectly influencing the return, on

equity. However, as our result is not statistically significant, we are unable to draw any inferences from it. The reason for lack of significance could be down to few factors. Confounding factors that were not taken into consideration during the regression analysis might be one explanation for this outcome. For instances, year specific and firm specific factors were included in our model to improve the results, however, factors related to market conditions was not included which could have influenced the results, leading to a lack of statistical significance between ESG score and ROE. One more reason could be the intricate connection between ESG factors and financial performance. ESG factors involve a wide range of non-financial metrics that can affect a company's operations and reputation in ways not accounted for in traditional financial models. Understanding how ESG practices impact business performance might need sophisticated analytical methods or a deeper comprehension of their influence on financial outcomes.

7.5.2 ESG score vs NM

Net margin measures the profit of a firm which is generated as a percentage of revenue. From the regression analysis performed, we can see a weak but statistically significant positive correlation between ESG scores and NM. The positive link, between ESG scores and net margin could largely be due to how ESG practices align with efficiency and cost control. Businesses that integrate sustainable practices into their strategies may see improvements in operations, reduced waste, and better use of resources leading to efficient cost management and increased net margins. Moreover, one more factor for the connection between ESG scores and NM might be due to the enhanced credibility and stakeholder trust from maintaining a strong ESG performance. Businesses that focus on ESG considerations tend to build rapport with customers, employees, investors and local residents, fostering trust and commitment. This improved reputation can lead to competitive advantages, higher customer loyalty and a stronger brand image which can result in boosted profits, from elevated sales and market presence. Additionally, the positive relationship, between ESG scores and NM may stem from the advantages of risk reduction linked to sustainable practices. Businesses that adeptly handle environmental and social risks are more prepared to foresee and tackle obstacles, decreasing the chances of controversial incidents or harm their reputation. Through management of ESG concerns, companies can reduce risks, boost their ability to withstand challenges, and safeguard their profitability, ultimately leading to a positive influence on net margins. Therefore, all the mentioned factors can be a reason of the positive relationship between ESG scores and NM.

7.5.3 ESG score vs OM

After operating expenses, a company's profit margin from each dollar of sales is measured by OM. According to our regression analysis, ESG-scores and OM have a statistically significant positive correlation. We can attempt to gain a better understanding of the outcome by dissecting the measurement. The metric represents the capacity of an organization to produce operating profit for every unit of revenue obtained. The reason behind finding such result is quite similar to NM. Companies with high ESG scores often improve their operations by implementing better resource management, such as of raw materials which is going to increase efficiency. Therefore, the overall operational costs will go down, thereby improving OM. With more and more innovative technologies, ESG focused companies also invest in process improvements which can enhance their operational efficiency and reduce costs, while positively impacting the OM.

7.5.4 Comparison of findings with previous literature

According to research, which have compiled findings from more than 2000 real world studies demonstrate a strong argument for ESG investing (Friede et al., 2015). This indicates that the connection between ESG ratings and financial indicators, like operating margin and net margin is backed by data reinforcing the importance of integrating ESG factors into investment choices. Additionally, the study conducted by Almeyda & Darmansya (2019) emphasized a favourable connection between ESG disclosure and the financial success of companies. This adds to the idea that ESG factors can have an impact on results aligning with the findings of a positive connection between ESG ratings and NM as well as OM. As for the ROE model results, the literature we found shows mixed results. A study by Buallay (2019) in the EU banking sector has shown that ESG factors is associated with financial performance metrics such as ROA and ROE. This backs our findings of the positive correlation, but it is not in line in terms of statistical significance. Shobhwani's study in 2023 matches our findings as the results of the research show an insignificant positive relationship between ESG scores and ROE.

It can be argued that findings from previous studies to some extent an explain the results we found. Even so, it cannot be denied that there is still a significant deviation from the findings from previous studies. Moreover, the generalizability of the study's results to other regions may raise doubts. The U.S are not the same as other less developed areas in terms of size and culture. Therefore, one may argue that if these results are to be extrapolated to other areas, scepticism has to be expressed.

8. Theoretical analysis

In this section, we will try to analyse our results by relating to the previous theories mentioned in the thesis.

8.1 Shareholder theory

The shareholder theory states that a firm's main duty is to maximize its profits in order satisfy its owners (Friedman, 1970). According to this view, financial performance (FP) is important for businesses since it tells shareholders how successful the company is. Despite the fact that excessive greenhouse gas emissions and global warming are making sustainability and green business practices more and more essential, individual investors have the capacity to influence corporate operations in the direction of these objectives. Shareholders play a critical role in both public relations and making financial decisions, which makes their perspectives critical for a firm's future performance.

Our regression analysis yielded mixed results, making it difficult to understand how a firm's shareholder view high ESG score as we found weak relationship among the variables. If shareholders value both profit and sustainability, companies might benefit from pursuing high ESG scores, as it positively affects both the net margin (NM) and operating margin (OM). While the return on equity (ROE) shows a positive relationship with ESG scores, this relationship is not statistically significant. Therefore, it is hard to provide a concrete conclusion due to contradicting results from previous studies.

Our model is not definitive and should not be seen as the absolute truth. If sustainability is the top priority for shareholders, then large-cap sensitive companies as categorized in this thesis from S&P 500 should aim for high ESG scores to attract shareholders and potentially enhance financial performance. Ultimately, firms should prioritize satisfying their shareholders to aid the business, and whether they should engage in sustainability efforts depends on their specific circumstances and shareholder preferences.

8.2 Stakeholder theory

The stakeholder theory suggests that businesses should focus on meeting the needs of all stakeholders and, not only shareholders by taking an approach towards social responsibility. This involves considering the concerns of all stakeholders related to the business and other impacted groups to ensure their success and sustainability (Freeman & Mcvea, 2001). The growing emphasis on eco friendly business practices is crucial in light of the increasing priority

in ESG factors as well as high levels of greenhouse gas emissions and global warming. This emphasis is especially relevant in the U.S, where sustainability holds crucial importance.

Having a high ESG rating or prioritizing sustainability can attract a range of stakeholders. While many acknowledge the significance of sustainability efforts, stakeholders, with financial interests may not always place it at the top of their priorities. Some investors, customers and suppliers prioritize profit above all; however, others may be willing to pay more or wait longer for quality sustainable products. According to stakeholder theory principles companies should aim to meet the needs of all stakeholders despite facing challenges.

Our findings present a picture that makes it challenging to reach a conclusion because of the weak relationship between ESG scores and the financial performance ratios used in the study. Still, we will try to shed some light on the relationship found using the stakeholder theory.

The results of our regression study may be explained by the stakeholder theory, as stakeholders may favor businesses that have sustainable practices and high ESG ratings. If we try to analyse, an increase in NM and OM could stem from operating costs or likely higher prices since sustainable products often command premium pricing due to their less efficient production processes. Stakeholders value companies with high ESG credentials and are willing to pay extra for sustainable offerings.

8.3 Legitimacy theory

"Legitimacy refers to the perception or assumption that an entity's actions align with the norms, values and beliefs of a given society (Burlea & Popa, 2013, p. 1579). U.S, a nation known for its focus, on sustainability what is deemed acceptable and legitimate is likely shaped by these core values. Therefore, it can be argued that major sensitive companies from the U.S should prioritize business practices as contributors to societal well being.

Like stakeholder and shareholder theories legitimacy theory suggests that companies should operate in a way that benefits not themselves but also the broader society they serve. By aligning their actions with interests, companies aim to gain acceptance and legitimacy which ultimately should lead to beneficial outcomes for both parties. If pursuing sustainability is viewed as legitimate and if this acceptance leads to improved performance over time, then the positive correlation between ESG scores and financial ratios used in the study could be explained by the legitimacy theory.

9. Weaknesses

There are quite a few weaknesses to the research performed. As mentioned before, I have only used ESG scores from Refinitiv Eikon. There are few more agencies that provide ESG scores, so perhaps using another data source might have enhanced our findings. Additionally, the regression models didn't account for economic factors (Example- GDP, Interest rate, etc.). One more weakness is using only the top four sensitive industries from S&P 500. More industries would have made the data set bigger, and the results could have been more comprehensive. As mentioned earlier, due to data availability issues, I had to reduce the data set. Therefore, we can argue that the lack of representativeness reduces the degree of trust in the findings.

10. Conclusion

The purpose of this study was to investigate whether there is any correlation between ESG and firm's financial performance from top four sensitive industries of S&P 500 between 2013 and 2022. The financial data and ESG scores were collected from the Refinitiv Eikon database. The regression models were constructed accordingly to investigate the effect between ESG and the chosen company's financial performance ratios.

The aim was to answer the following research question below:

'How ESG scores affect the financial performance of firms from sensitive industries?'

Summary of findings

The result from our study revealed that there is a statistically significance but weak positive correlation between ESG scores and net margin and operating margin. However, the relationship between ESG score and ROE showed also a weak positive relationship but not statistically significant.

Implications for Net Margin and Operating Margin

Net Margin and Operating Margin play roles in assessing a company's profitability. While the relationship, between them is somewhat positive but not strong it implies that companies, with ESG ratings generally exhibit improved profit margins. This discovery supports the idea that adopting sustainable measures can result in improved profitability levels as studied from previous literature presented.

Insights on Return on Equity

According to our results, there is a weak positive correlation between ESG scores and ROE. However, it is not statistically significant as suggested by the regression results. ROE indicates how well a company can make profits from the investments of its shareholders and is a critical metric for investors. The absence of a correlation implies that ROE might be affected by factors, beyond just ESG performance unlike Net Margin and Operating Margin. Some reasons have already been discussed before but let's try to shed some more light on the relationship.

Return on equity (ROE) is affected by factors profit margins and asset turnover. While ESG practices can influence some of these factors, their impact may not be strong enough to have a significant effect on ROE. For example, high ESG scores could result in initial expenses or investments that may not immediately translate in equity returns. Moreover, the advantages of ESG initiatives may take time to show results, which could be why there isn't an effect, on ROE as time lag was not considered in the study. Investing in sustainability may not bring financial gains immediately but could enhance performance in the future as market trends and consumer preferences evolve.

Broader context

The results of this study add to the increasing evidence showing that ESG initiatives can enhance outcomes in terms of financial performance. Nevertheless, the limited correlations suggest that this connection is intricate and affected by multiple factors.

In summary, the link between ESG ratings and financial performance ratios like net margin and operating margin is not very strong. The impact on return on equity remains uncertain indicating the necessity for further research. Therefore, we can say that the findings from this study is not conclusive enough to provide a definite answer on the impact of financial performance due to ESG scores.

10.1 Truth criteria

According to Ali & Yusof's study in (2011), a research is considered genuine and strong unless if it meets three specific requirements. These requirements include reliability, validity and generalizability. In this section we will delve deeper into each criterion. Discuss our efforts to fulfill them.

10.1.1 Reliability

Reliability is measured by a study's capacity to be repeated, which means that any other researcher should be able to get the same results with the same data and analysis techniques (Ali & Yusof, 2011). Five tactics may be employed to improve the dependability of the research process and results: the use of tables, continuous data comparison, refutational analysis, thorough data utilization, and inclusion of deviant examples. (Leung, 2015). Evaluating the interpretation of outcomes against the available data is a continuous data comparison. Examining inconsistencies between several findings is the task of refutational analysis. Making sure the data is legitimate and officially organized are the tasks of the final three options.

The data for this study was collected from Refinitiv Eikon. Other researchers can access this data to replicate the analysis conducted in this thesis. While it is possible to retrieve the same variables and financial information from any other databases, it is not recommended as these databases may calculate certain variables differently or provide varying levels of data quality and quantity. Therefore, I suggest using the database that I utilized. The data has been quantified statistically to ensure that our personal opinions and interpretations do not influence the outcomes. However, we cannot completely dismiss the possibility of human errors in the data.

10.1.2 Validity

The concept of validity refers to how the process, data, and tools utilized in a study align with its objectives. It looks at whether the study appropriately samples the data, if the technique is suitable, whether the research topic is well-chosen, whether the analysis and findings are solid, and whether the research properly dives into its intended subject matter. (Leung, 2015).

According to a study by Taherdoost (2016) there are four methods for guaranteeing validity, criteria validity, content validity, construct and face validity. Among these methods face validity stands out as an employed approach that I have taken into account. This method involves evaluating whether the sample matches the concept under study. In the study, I have appropriately used a sample comprising 400 observations without misrepresenting the results. Forty companies from four industries were used in the study. Initially, more industries and companies were considered, however, due to data availability issues, it was reduced. This could potentially impact the study's overall validity.

10.1.3 Generalizability

The concept of generalizability refers to "how well the results can be extended beyond the sample to the total population" (Ali & Yusof, 2011). This research centers on the large cap firms from the top four ESG sensitive industries of S&P 500. By studying the companies from these four industries, it gives a moderate picture of the overall trend in the industries selected. Therefore, we can say that it gives some generalizability to our study.

10.2 Theoretical contributions

This article delves into a study that explores the relationship between financial performance (FP) and ESG scores. The research involved conducting regression analysis to examine the relationship between FP ratios and ESG scores. What sets this study apart is the selection of FP metrics—ROE, NM and OM—and the particular timeframe used. Prior studies have yielded results regarding the correlation between financial performance and ESG scores. This research aims to deepen the understanding of how ESG scores influence the financial performance of companies. By contributing to existing literature with insights, this thesis addresses the existing disparity in findings on the link between ESG scores and financial performance in the context of ESG sensitive industries.

10.3 Practical contributions

I believe that my study will give important insights to both the board of directors and investors of the chosen companies when they consider the practical results that were discovered. The positive correlation between the studied financial ratios and ESG scores implies that the ESG sensitive companies with high ESG scores can achieve profitability. This suggests that higher ESG ratings could potentially reduce a company's expenses while maintaining profits or revenues. It also indicates that consumers may be willing to pay more for goods, which can be beneficial for businesses with sustainability efforts. Therefore, we propose that aiming for a high ESG score is advantageous for the studied companies due to the enhanced financial performance and its contribution to societal sustainability.

10.4 Ethical considerations

I have made every effort to be transparent and truthful about the research process and findings. The details of the research process can be found in the 'Methodology' section while the data and results are outlined in their respective sections of the same name. The study is not influenced by any commercial interests that could impact the outcomes. I solely relied on official databases to gather information for this thesis and refrained from using any previous

results without proper authorization. To ensure clarity and organization, I have presented various tests, provided tables and figures assessing their reliability based on credible sources. My research aims not to cause harm but proposes that companies should strive for ESG scores to enhance their financial performance as well as benefit society and the environment.

11. Further research

This thesis specifically looks at how a ESG sensitive companies' overall ESG score can impact its financial performance. It would also be valuable to look into each E (Environmental) S (Social) and G (Governance) pillar individually to understand their effects, on performance. Exploring non-sensitive industry data could also uncover variations in how ESG influences financial performance across different sectors. Therefore, a comparison study can be performed to see how ESG scores affect both the categories of industries. Future studies could benefit from using ESG scores from different rating agencies to spot any discrepancies that might impact the findings.

The focus, on ESG has grown in recent years. It is understood that it will become more important in the future. To assess whether the ongoing emphasis on ESG by investors and society as a whole would lead to a correlation between ESG and financial performance down the line, I propose revisiting the study in three to five years.

12. References

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13. Appendix

Appendix 1: Regression results

ROE:

```
Residuals:
      Min       1Q   Median       3Q      Max
-1.76493 -0.09791  0.01397  0.07926  1.62853

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  -0.123292   0.352418  -0.350  0.72664
ESG           0.001118   0.001106   1.011  0.31268
DR           -0.222061   0.087856  -2.528  0.01188 *
Log_TA       0.027466   0.035733   0.769  0.44256
year_indicator 0.015180   0.005112   2.970  0.00317 **
firm_indicator 0.000616   0.001363   0.452  0.65146
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2775 on 394 degrees of freedom
Multiple R-squared:  0.05098,    Adjusted R-squared:  0.03894
F-statistic: 4.233 on 5 and 394 DF,  p-value: 0.0009245
```

NM:

```
Residuals:
      Min       1Q   Median       3Q      Max
-0.81341 -0.04381  0.00138  0.05106  0.27757

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.1178218   0.1400329   0.841  0.400642
ESG           0.0014819   0.0004396   3.371  0.000823 ***
DR           -0.1486366   0.0349095  -4.258  2.58e-05 ***
Log_TA       -0.0099949   0.0141983  -0.704  0.481879
year_indicator 0.0025692   0.0020312   1.265  0.206664
firm_indicator 0.0028777   0.0005415   5.315  1.79e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1102 on 394 degrees of freedom
Multiple R-squared:  0.1073,    Adjusted R-squared:  0.09602
F-statistic: 9.476 on 5 and 394 DF,  p-value: 1.513e-08
```

OM:

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.34690 -0.06880 -0.01672  0.06896  0.33516

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.3226899  0.1315268   2.453 0.014583 *
ESG          0.0015592  0.0004129   3.776 0.000184 ***
DR          -0.1176158  0.0327890  -3.587 0.000377 ***
Log_TA      -0.0242215  0.0133358  -1.816 0.070089 .
year_indicator 0.0029452  0.0019078   1.544 0.123440
firm_indicator 0.0015862  0.0005086   3.119 0.001948 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1036 on 394 degrees of freedom
Multiple R-squared:  0.08164, Adjusted R-squared:  0.06998
F-statistic: 7.005 on 5 and 394 DF, p-value: 2.755e-06

```

Appendix 2: Robustness standard error results

ROE:

```

            Estimate Std. Error t value Pr(>|t|)
(Intercept) -0.12329181  0.25632577  -0.4810 0.630786
ESG          0.00111836  0.00068791   1.6257 0.104805
DR          -0.22206086  0.17908559  -1.2400 0.215724
Log_TA      0.02746567  0.03221828   0.8525 0.394462
year_indicator 0.01517963  0.00468830   3.2378 0.001307 **
firm_indicator 0.00061604  0.00096461   0.6386 0.523425

```

NM:

```

            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.11782179  0.09474205   1.2436  0.2144
ESG          0.00148188  0.00037300   3.9728 8.445e-05 ***
DR          -0.14863663  0.03611668  -4.1155 4.708e-05 ***
Log_TA      -0.00999492  0.00904249  -1.1053  0.2697
year_indicator 0.00256918  0.00179831   1.4287  0.1539
firm_indicator 0.00287768  0.00061166   4.7047 3.524e-06 ***

```

OM:

```

            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.32268986  0.10956824   2.9451 0.0034199 **
ESG          0.00155923  0.00039183   3.9794 8.225e-05 ***
DR          -0.11761578  0.03458785  -3.4005 0.0007414 ***
Log_TA      -0.02422152  0.01041583  -2.3255 0.0205548 *
year_indicator 0.00294525  0.00192357   1.5311 0.1265390
firm_indicator 0.00158624  0.00053376   2.9718 0.0031419 **

```