

Saint Petersburg State University

Graduate School of Management

Master in Corporate Finance

**ESG AND FINANCIAL PERFORMANCE: DO ESG FACTORS CREATE VALUE FOR
COMPANIES?**

Master's Thesis by 2nd year student

Concentration – MCF (Corporate Finance)

Anna Isaeva

Research advisor

Associate Professor, Yulia B. Ilina

Saint Petersburg – 2023

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Исаева Анна Валерьевна, студентка второго курса магистратуры направления «Корпоративные финансы», заявляю, что в моей магистерской диссертации на тему «Экологическая, социальная и корпоративная ответственность и финансовая результативность: создают ли данные факторы ценность для компаний?», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

Все прямые заимствования из печатных и электронных источников, а также из защищенных ранее выпускных квалификационных работ, кандидатских и докторских диссертаций имеют соответствующие ссылки.

Мне известно содержание п. 9.7.1 Правил обучения по основным образовательным программам высшего и среднего профессионального образования в СПбГУ о том, что «ВКР выполняется индивидуально каждым студентом под руководством назначенного ему научного руководителя», и п. 51 Устава федерального государственного бюджетного образовательного учреждения высшего профессионального образования «Санкт-Петербургский государственный университет» о том, что «студент подлежит отчислению из Санкт-Петербургского университета за представление курсовой или выпускной квалификационной работы, выполненной другим лицом (лицами)».



_____ (Подпись студента)

_____ 29.05.2023 _____

_____ (Дата)

STATEMENT ABOUT THE INDEPENDENT CHARACTER OF THE MASTER THESIS

I, Isaeva Anna, second year master student, program «Corporate Finance», state that my master thesis on the topic “ESG and financial performance: do ESG factors create value for companies?”, which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

I am aware that according to paragraph 9.7.1. of Guidelines for instruction in major curriculum programs of higher and secondary professional education at St. Petersburg University «A master thesis must be completed by each of the degree candidates individually under the supervision of his or her advisor», and according to paragraph 51 of Charter of the Federal State Institution of Higher Professional Education Saint-Petersburg State University «a student can be expelled from St. Petersburg University for submitting of the course or graduation qualification work developed by other person (persons)».



_____ (Student's signature)

_____ 29.05.2023 _____

_____ (Date)

АННОТАЦИЯ

Автор	Исаева Анна Валерьевна
Название магистерской диссертации	Экологическая, социальная и корпоративная ответственность и финансовая результативность: создают ли данные факторы ценность для компаний?
Факультет	Высшая школа менеджмента
Специальность	38.04.02 Менеджмент, Корпоративные финансы
Год	2023
Научный руководитель	Ильина Юлия Борисовна
Описание цели, задач и основных результатов	<p>С увеличением экологических изменений ESG-принципы приобретают все большее значение. Воздействие этих изменений может стать причиной серьезных социальных, экономических последствий, которые с течением времени будут усиливаться. Именно поэтому ESG становится темой общественного обсуждения, требуя от правительств и компаний предпринимать меры по борьбе с изменением климата и сокращению выбросов парниковых газов. Все это неизбежно повлияет на финансовую результативность компаний, однако они все еще сталкиваются с трудностями внедрения устойчивых принципов в своей стратегии, так как сложно определить точную ценность, которую приносит ESG. В связи с этим, цель научной работы заключается в оценке этого эффекта с помощью анализа разницы средних значений и построения регрессионных моделей на основе панельных данных. Результаты исследования для компаний из индекса S&P500 за период с 2015 по 2021 годы демонстрируют сильную взаимосвязь между ESG-оценкой и финансовой результативностью. В частности, компании с более высокой ESG-оценкой оцениваются выше на рынке по Tobin's Q, и имеют более высокую операционную эффективность, выраженную в показателе ROE. Это исследование показывает, что ESG-рынок продолжает расти, а давление на компании со стороны инвесторов и регуляторов только усиливается. Поэтому для бизнеса крайне важно как можно скорее начать внедрять ESG-принципы, чтобы не остаться позади. Исследование может послужить отправной точкой для преодоления опасений внедрения устойчивых стандартов в операционную деятельность и демонстрирует, что ESG-трансформация может принести положительные финансовые результаты.</p>
Ключевые слова	ESG оценки, рентабельность собственного капитала, коэффициент Тобиана, финансовая результативность

ABSTRACT

Master Student's Name	Anna V. Isaeva
Master Thesis Title	ESG and financial performance: do ESG factors create value for companies?
Faculty	Graduate School of Management
Major Subject	38.04.02 "Management", Corporate Finance (MCF)
Year	2023
Academic Advisor's Name	Yulia B. Ilina
Description of the goal, tasks and main results	<p>As environmental change intensifies, ESG principles become increasingly important. Ecological changes effects can have serious social, economic and environmental consequences, which will increase over time. Therefore, ESG is becoming a topic of public discourse, requiring governments and companies to take action to combat climate change and reduce greenhouse gas emissions. All of this is bound to have an impact on companies' financial performance, but they are still struggling to introduce ESG principles in the strategy, because it is difficult to evaluate what exact value ESG brings. That is why, the aim of the research paper is to estimate this effect via difference-in-means analysis and panel regression models. The results for companies from 2015-2021 S&P500 index demonstrate strong dependency between ESG score and financial performance. In particular, companies with higher ESG scores are valued higher on the market, estimated by Tobin's Q, and have better operational efficiency, expressed by ROE. This research reveals that the ESG market continues to expand, and there is mounting pressure on companies from both investors and regulators. Hence, it is crucial for businesses to establish an ESG agenda as sooner as possible to avoid being left behind. The study can serve as a starting point towards overcoming the apprehension of incorporating sustainable standards into operations and demonstrate that embracing ESG transformation can produce positive financial outcomes.</p>
Keywords	ESG scores, ROE, Tobin's Q, financial performance

CONTENT

INTRODUCTION	6
CHAPTER 1. IMPACT OF ESG FACTORS ON FINANCIAL PERFORMANCE: THEORETICAL BACKGROUND	9
1.1 THE CONCEPT OF ESG: MAIN THEORIES AND IMPACT MECHANISMS.....	9
1.2 ESG TRANSFORMATION: MARKET OVERVIEW	14
1.3 THE RELATIONSHIP BETWEEN ESG AND PERFORMANCE: LITERATURE REVIEW AND HYPOTHESES STATEMENT	19
CHAPTER 2. EMPIRICAL ANALYSIS	24
2.1 DATA.....	24
2.2 METHODOLOGY.....	25
2.3 DESCRIPTIVE STATISTICS AND SAMPLE ANALYSIS.....	27
2.4 DIFFERENCE-IN-MEANS ANALYSIS.....	33
2.5 REGRESSION ANALYSIS RESULTS.....	37
DISCUSSION	40
CONCLUSION.....	42
LITERATURE.....	43
APPENDIX.....	53

INTRODUCTION

Sustainability and ESG are growing trends of the last few years in business and society. ESG is a set of characteristics used to assess the social and environmental responsibility of a business, as well as actions to improve the environment, working conditions for employees and transparency of interaction between management and external stakeholders. Before the coronavirus crisis ESG issues were already on the agenda of many companies, but with the pandemic, their importance has skyrocketed. Thus, the majority of investors realized that non-financial risks may have even a greater impact on portfolio returns and began to pay more attention to companies' non-financial metrics when developing investment strategy and making decisions. As for the society, the pandemic has only increased social inequality and poverty. Besides, after the lockdown, people began to value the environment and social interaction more than ever. Generally, the culture of consumption of goods and services has also changed. More and more consumers are getting to appreciate companies for the values they create, not for the lower price or discounts available. All this becomes irrefutable evidence that ESG comes to the fore, forcing companies to redefine their strategies and identify new approaches to consumers and investors.

With the help of ESG-sensitive investing the investors are able to create portfolios that are consistent with their own values, thus influencing the market and the economy by supporting companies with a mission close to them. At the same time, ESG investing turns out to be no less profitable than traditional investing. More than \$650 billion has been invested in ESG funds, most of which have outperformed conventional funds in terms of profitability and financial performance (Kerber, Jessop, 2021). The current green bonds market also continues to expand with the bond issuance exceeding \$500 billion (Jones, 2022). Many research papers also confirm that accounting for the ESG criteria improves portfolio returns, creating long-term growth prospects (Kenan Insight, 2022, Stotz, 2022). This is explained by lower reputational, political and regulatory risks, which in turn leads to more stable cash flow and increased profitability. According to the Morgan Stanley Institute for Sustainable Investing, from 2004 to 2018, the decline in downside risk volatility in ESG funds was 20 percent less than in conventional funds (Morgan Stanley, 2019).

However, the actual profitability of ESG investing has its own ambiguities. For example, many companies may simply use notional environmentalism to improve their reputation in the eyes of investors and hide the real harm from their operations. It seems that ESG rhetoric formally generates benefits for the company in the form of investments, but actual actions to improve sustainability do not bring returns and only increase costs. Many sceptics of ESG even believe that corporate executives are still trying to satisfy shareholders and maximize their wealth, only

nominally proclaiming sustainable goals that are unlikely to be achieved, thereby intensifying the controversy surrounding the topic of ESG. Similarly, there is no consensus on the impact of the inclusion of ESG factors in the company's strategy on its financial performance in the existing literature.

One thing becomes clear for sure - ESG will stay with us for a long time. This indicator is becoming more and more important, especially in connection with climate change and the efforts of companies to find competitive advantages and differentiation. Now it is significant for managers to think about creating value beyond the purely economic, so social and ecological situation requires business to focus value creation on all stakeholders (including communities, employees and customers) and not just shareholders. Such a broader interpretation of value may ensure the long-term competitiveness, profit and health of the business, since it simultaneously reduces risks and allows the maximum use of limited resources. The effectiveness of ESG and their application in management decisions are becoming a form of indirect measurement of the governance quality along with its financial data. However, the most important question remains - is it possible to turn ESG transformation into positive financial performance for companies?

This research study complements the existing literature and attempts to resolve the current debate's confusion and inconsistency, surrounding ESG. The results may help business practitioners overcome the hesitation to make innovative changes in their business models, evaluate current and implement new sustainability-focused initiatives. ESG implementation may contribute to strengthening ties between companies and stakeholders and increase trust to the company, which can help them more calmly endure global economic and political changes. In our research paper, we are going to consider the impact of ESG for the industry mix. We will take data on companies included in the S&P500 index for 2015-2021. This index consists of the largest firms by the capitalization in the world that widely disclose ESG reports and therefore represent a large sample for research. A wide range of industries will also allow us to consider the impact on individual industries and compare them with each other. A wide time span will also allow to assess the impact of ESG across time, track changes in the perception of ESG and examine changes in financial indicators due to the impact of sustainable standards.

The objective of this research is to determine the relationship between ESG and financial performance for companies based on the data of The Bloomberg database from 2015 to 2021, which provides information on the Environmental, Social and Governance scores. The basic purpose of the study is to provide quantitative assessment of relationship between ESG score metrics and financial performance indicators (Tobin's Q, ROE) by making difference in means analysis and building panel regression model. It is important to verify a statistically significant

difference from zero of ESG scores coefficients, identify the direction and the degree of this influence on financial performance. That is why, the final research question is “Do ESG indicators increase companies’ value and improve their financial performance?” To answer the research question, the following objectives were set:

1. To study the theoretical background of the relationship between ESG and financial performance of companies, in particular the theory underlying this concept, the mechanisms of influence and current market conditions
2. Empirically examine the relationship between ESG and financial performance
3. Come to practical conclusions, demonstrate the importance of the study and develop follow-up recommendations

In the first chapter of this research paper we will look at the mechanism of ESG influence on companies’ financials and the theory behind that influence; in the second chapter we will test empirically the possible influence and confirm or refute the hypotheses presented in the literature review. The regression modelling will allow us to assess the degree of influence over time and to correlate these results with events in the social and economic spheres. Also, it will become possible to track the dynamic of changes over different periods of ESG transformation announcements. With this knowledge in mind, it will become feasible to see if the ESG really doing good or just sounding good, whether it is helpful to company’s value creation or companies just need to get used to the new sustainability standards without expecting return.

CHAPTER 1. IMPACT OF ESG FACTORS ON FINANCIAL PERFORMANCE: THEORETICAL BACKGROUND

1.1 THE CONCEPT OF ESG: MAIN THEORIES AND IMPACT MECHANISMS

The term ESG refers to environmental, social and governance factors that go far beyond the financial indicators traditionally used by investors when assessing the expediency of investments. The history of ESG goes back to the 1970s, when due to racial segregation in South Africa, a massive outflow of investments occurred for ethical reasons. Moreover, after many major environmental incidents, it became clear that financing businesses with a low level of responsibility can lead to a high risk of losses and bankruptcy. Since then, socially responsible investing (SRI) concept which is the concept of building a financial model of a firm aimed not only at increasing a company value, but also at a positive social and environmental effect, has begun to develop and transform greatly.

The development of ESG in recent years can be explained by a number of factors, such as the growing attention to climate change and ecology, as well as the increase in transparency of companies regarding ESG impact and subsequent attention to these companies from investors. ESG is a set of indicators that allow to evaluate a company's performance and its ability to create long-term value not only for shareholders, but for the society as well. This set is comprised of three pillars, such as ecological, social and governance. Environmental factors determine how much the company cares about the environment and how it tries to reduce the damage caused to the ecology. Social factors show the attitude of the company towards staff, suppliers and clients. This pillar is responsible for providing equal labor conditions, gender equality in the workplace and investments to social projects. Governance factors demonstrate the transparency of reports, balance in communication of shareholders and management. The ESG rating is a cumulative indicator of all three components, which allows to evaluate the effectiveness of a company from three different aspects.

Boards of directors, shareholders and regulators are increasingly paying attention to the fact that compliance with the ESG agenda is coming to the fore and becoming the most important indicator of the sustainable development of companies. There are more and more tools that allow businesses to make an ESG transition and rebuild processes. Social and green bonds, loans and deposits with the rates linked to ESG reporting, help businesses to change. But the increasing attention to this topic has raised the question of how exactly compliance with ESG can affect the company's value, whether this influence is positive/negative or there is no significant effect at all. To understand this, it is important to study the theory behind the ESG concept and to examine the possible mechanisms of influence considered in previous studies.

There are certain theories that describe the possible influence of ESG rating on the company's value. One of these theories is *the Legitimacy theory*, which explains the impact of ESG primarily through information disclosure (Table 1). According to it, a company should disclose ESG information in its reports to show stakeholders that the company complies with norms and laws (Deegan, 2014). It is required to remove the gap between the company's insiders, investors and customers so they can understand the possible future company's prospects. Thus, the disclosure of ESG information helps to reduce data asymmetry and gives a signal that corporate actions are considered appropriate within the framework of social and environmental pillars, in consequence improving company's reputation and value (Reber et al., 2021).

Another theory underlying ESG is *the Social Contract Theory*. It states that companies have social obligations to society, and if a company does not fulfill its obligations and does not follow ESG standards, then the public refuses to cooperate with these firms that may lead to sharp decrease in their value (Deegan, 2014). It is achieved, for example, by refusing to buy and consume the company's goods, lobbying for an increase in taxation, etc. Therefore, to achieve success companies are now moving away from the maximizing shareholders' wealth way of thinking and making the transition to the socially responsible behavior, when they are getting responsible not only to the shareholders, but to the stakeholders - suppliers, consumers and employees (Thorne, Ferrell et al. 2011). By building trusting relationships with the stakeholders companies get the opportunity to thrive together with customers and communities.

Table 1. Theories behind ESG

Theories behind ESG	
Legitimacy Theory	A company should disclose ESG information in its reports to show stakeholders that the company complies with norms and laws (Deegan, 2014). It is required to remove the gap between the company's insiders, investors and customers. The disclosure helps to reduce data asymmetry and gives a signal that corporate actions are considered appropriate within the sustainability norms (Reber et al., 2021)
Social Contract Theory	It states that companies have social obligations to society, and if a company does not fulfill its obligations, then the public refuses to cooperate with these firms that may lead to decrease in their value (Deegan, 2014). It is achieved, for example, by refusing to buy and consume the company's goods, lobbying for an increase in taxation, etc.

That is why, one of the possible mechanisms of ESG influence on the company's value is through consumers (Table 2). Customers increasingly want to deal with companies that reflect their values and if a company does not correspond to these values, consumers will seek to influence the reputation of the company through negative reviews on social networks or simply by refusing to buy company's products (Martínez, 2022). In the meantime, if the company invests in sustainable practices, then consumers buy company's products with greater confidence that may

boost demand and drive profit up. For example, a recent study in retail showed that two-thirds of consumers are willing to pay a higher price for eco-friendly products and that the compliance with ESG is more appreciated by them than just branding. At the same time, executives interviewed considered that consumers would choose opposite answers – that the public is not ready to pay higher price for sustainable products (First Insight, 2022). It is obvious that the situation is changing now, and the trend towards ecologically, socially and governance responsible participation among consumers is greatly increasing. Many recent studies also confirm that corporations that take care of the environment and strive to preserve the natural resources enhance their brand image (He et al., 2014; Ramesh et al., 2019; Bianchi et al., 2019; Wu et al., 2014). Moreover, if a firm follows a CSR approach, for example, helps charitable organizations and finances charitable programs, it also improves its image and increases consumer loyalty (Brunk, 2010; Waddock et al., 2002). Customers even perceive the products of these companies as more reliable and having a better quality.

Recently, there has been a growing trend towards the release of sustainability reports. Sustainability reports allow external stakeholders to evaluate the company's activities in terms of economic, social or environmental achievements. The reports are issued in order to share information with a wide range of interested parties from investors to creditors or government institutions. There are many reasons why companies agree to share sustainability reports voluntarily. Firstly, it helps the companies to set goals, track the results and introduce the ethical business principles (Caesaria, Basuki, 2017). Secondly, it is important to report sustainability indicators to benchmark the firm's performance - to compare the level of sustainability with other companies within the industry and evaluate competitive advantages (Ogundare, 2013). In addition, reporting on sustainable development increases the transparency of the company and, by creating a positive reputation in the eyes of investors, contributes to increasing the value of the company (Abdul Aziz, Hj Bidin, 2017). For example, a study conducted by the Chartered Accountants of Canada (2010) showed that investors do use ESG reports when making decisions. These reports help them understand potential risks and profitability, assess the quality of management and the asset managers themselves.

Many recent studies demonstrate that ESG factors are used in investment strategy not only by managers of ethical, responsible or green funds, but also by managers of conventional investment funds. For example, the factors are actively introduced into the construction of an investment portfolio, in particular in red flags strategies (excluding stocks that are involved with serious environmental, social, or governance issues) and in managing the risks (Van Duuren et al., 2016). Meanwhile, another study showed that USA shareholders, on the contrary, use an

inclusivity strategy, adding ESG factors in their analysis, but not excluding companies with lower sustainability indicators at the same time. However, this strategy begins to be considered as controversial, many investors in other countries intentionally avoid investing in environmentally harmful industries, such as energy or manufacturing companies (Arabella Advisors, 2018, World Bank Group, 2017). But the question arises, is there any real effect from the inclusion of ESG indicators in the portfolio? The research of MSCI shows that there is an impact, so the inclusion of ESG criteria in investment strategies has generally improved risk-adjusted performance and changed the portfolio towards higher quality and less volatile securities (Melas et al., 2016). Thus, the introduction of ESG in investments may benefit both companies and investors.

Some researchers criticize and question the real influence of ESG on companies and believe that this influence is observed only because of impression management and the creation of a positive image (Cho et al., 2014). Some companies even exploit the greenwashing practice, setting very global sustainability goals in their reports, but fulfilling them very poorly (Yu et al., 2020). We can not reject that some companies can actually use the greenwashing and manipulate the data. However, the disclosure of ESG information itself with the setting of specific goals and the publication of real figures regarding sustainability has a positive impact on the value of the company. The Reber's study, using the example of companies undergoing an initial public offering, shows that the mechanism of ESG influence is reflected not only through brand or positive image (since such companies do not have a well-established reputation yet), but through risk reduction as well (Reber et al., 2021). In his opinion, the impact comes from the decrease of data asymmetry and uncertainty associated with asset pricing. Thus, the study confirms that the disclosure of ESG factors gives a positive signal to investors and reduces the idiosyncratic risks (specific company's risks not associated with the market) of adverse events, as well as reduces the risk of a fall in the value of the stock of IPO companies. What is more, many research papers analyze the correlation between the ESG disclosure and the cost of debt and equity, because credit agencies now include the ESG metrics in modelling the risk profile of their counterparties (Dhaliwal et al., 2014; Eliwa et al., 2019; Wong et al., 2020). For example, S&P Global takes into account ESG pillars in assessing financial and business risks of companies (S&P Global Ratings, 2021). And of course, in general, firms with a weak management system and a lack of compliance with sustainability practices in environmentally hazardous industries are generally exposed to larger regulatory and financial risks (Schanzenbach, Sitkof, 2020).

One more possible way to value creation from introduction of ESG strategies is through costs reduction. McKinsey's research has demonstrated that the introduction of ESG into the company's activities can reduce operating costs significantly (for example, the cost of raw

materials). Companies with a high ESG rating are also more resource efficient and have higher financial indicators. And even though the cost of implementing sustainable practices may be high in the short term, the company will benefit much more from saving resources in the long term (McKinsey, 2019).

Table 2. Mechanisms of ESG influence

	Mechanisms of ESG influence on the company's value
Consumers	<p>If a company does not correspond to customers' values, consumers can influence the company reputation through negative reviews on social networks or by refusing to buy company's products (Ricardo Martínez, 2022)</p> <p>If company is sustainable enough, consumers buy products with greater confidence that boost demand and drive profit up. Two-thirds of consumers are willing to pay a higher price for eco-friendly products (First Insight, 2022)</p> <p>Corporations that take care of the environment and help charitable organizations enhance their brand image and increase consumer loyalty (He et al., 2014; Ramesh et al., 2019; Bianchi et al., 2019; Wu et al., 2014, Brunk, 2010; Waddock et al., 2002)</p>
Sustainability reporting	<p>Investors do use ESG reports when making decisions (Chartered Accountants of Canada, 2010)</p> <p>Reporting on sustainability increases the transparency and, by creating a positive reputation in the eyes of investors, contributes to the value of the company (Abdul Aziz, Hj Bidin, 2017)</p> <p>It helps the companies to set goals, track the results and introduce the ethical business principles (Caesaria, Basuki, 2017)</p> <p>It helps to benchmark the firm's performance - to compare the level of sustainability with other companies within the industry and evaluate competitive advantages (Ogundare, 2013)</p>
Investors	<p>Investors apply ESG factors in the construction of an investment portfolio, in red flags strategies (excluding stocks that are involved with serious environmental, social, or governance issues) and in managing the risks (Van Duuren et al., 2016)</p> <p>The inclusion of ESG criteria in investment strategies may improve risk-adjusted performance and change the portfolio towards higher quality and less volatile securities (Melas et al., 2016).</p>
Risk reduction	<p>The disclosure of ESG factors gives a positive signal to investors and reduces the idiosyncratic risks (specific company's risks not associated with the market) of adverse events, as well as reduces the risk of a fall in the value of the stock (Reber et al., 2021)</p> <p>Firms with a weak management system and a lack of compliance with sustainability practices in environmentally hazardous industries are generally exposed to large regulatory and financial risks (Schanzenbach, Sitkof, 2020)</p> <p>Decrease in the risk of default, because credit agencies now include the ESG metrics in modelling the risk profile of their counterparties (Dhaliwal et al., 2014; Eliwa et al., 2019; Wong et al., 2020)</p>
Costs reduction	<p>The introduction of ESG into the company's activities can reduce operating costs significantly (for example, the cost of raw materials). Companies with a high ESG rating are also more resource efficient and may benefit from innovations (McKinsey, 2019, Porter, 1995)</p>

1.2 ESG TRANSFORMATION: MARKET OVERVIEW

Companies are also recognizing the importance of ESG transformation, both as a response to stakeholder expectations and as a means of improving their financial performance. At the moment, in most countries the publication of sustainability reports is more of a volunteer nature, but there are already and continue to be demands from investors and organizations for some mandatory reporting.

For example, Security and Exchange commission (SEC) regulation is about to be implemented, requiring public USA companies to disclose certain climate-related risks and the amount of greenhouse gas emissions. British companies are already required to publish this same risks in strategic reports if the company has more than 500 employees or a turnover of more than 500 million (Yu, 2022). There is also a developed framework for ESG reporting in Asian countries: in Malaysia disclosure has become mandatory since 2016, China has developed guidelines for what ESG reporting will look like after mandatory implementation. So even if the need to follow ESG standards is still not mandatory, that may change very soon. In addition, the IASB recently announced the possibility of including climate disclosures in IFRS reporting (IFRS, 2023). The need to implement these changes stems from the fact that climate-related risks are often perceived as low probability and may not be adequately accounted for in financial statements, while investors need better information about the impact of climate-related risks on the carrying amounts of assets and liabilities. So companies should already be watching for legislative changes that are being implemented. It is also simply good practice in business strategy to include sustainability metrics such as carbon footprint, board composition and employee engagement in corporate reporting. All of this will create a positive impression of the firm, that it follows global trends and legal regulations, increasing not only financial performance, but also caring for the environment.

In addition, stricter requirements are observed for the entire supply chain. More recently, the EU has also approved due diligence from 2024 on the sustainability of the entire corporate value chain (European Parliament, 2023). Firms will be obliged to identify and, if necessary, prevent the negative impact of their activities, including activities of their business partners, on human rights and the environment. These include labor exploitation, pollution, environmental degradation and loss of biodiversity. Thus, companies will not only have to regulate their own activities, but also those of their partners along the entire value chain with activities related to the sale, distribution and transportation of raw materials and finished products. Penalties for non-compliance will be at least 5% of net global turnover. In addition, all company directors will be required to implement a transition plan compatible with the 1.5°C global warming limit. For

companies with more than 1,000 employees, directors will be directly financially responsible for this, reducing their annual bonus.

Although the history of ESG began quite a long time ago - intensive changes began after the 2015 Paris Agreement, the global goal of which is to prevent global temperature increases of more than 1.5 degrees (Paris Agreement, 2015). The agreement was signed by 192 countries, 113 of which had ratified it. One of the ways to reduce carbon emissions and limit global warming offered was to encourage countries to use of carbon pricing mechanisms, such as emissions trading schemes or carbon taxes in order to create incentives for reducing carbon emissions. This will be implemented and cross-border carbon tax in the EU, obliging importers to buy certificates of carbon at a price that would be paid by the local producer in accordance with Carbon Border Adjustment Mechanism (CBAM) (European Commission, 2022). The cost of the certificates will be floating, with a link to prices on the EU carbon credit market. Typically, a carbon tax increases the cost of burning fossil fuels, thereby increasing the cost of producing goods and services and greatly affecting companies in the industrial and energy sectors. Therefore, companies that produce large volumes of products and consume large amounts of energy may face higher production costs due to the CO₂ tax. This can increase production costs and reduce profitability. However, in contrast, companies will be able to switch to renewable energy sources, increase energy efficiency and use cleaner technologies, thereby reducing their tax payments.

A recent study by Moody's found that the largest polluting companies have nominal debt twice as high as at the time of the Paris Agreement. Industries deemed to have "very high" or "high" environmental credit risks have nominal debt of about \$4.3 trillion (Bloomberg, 2023). That signals that corporations without credible plans to reduce emissions to zero are likely to face higher capital costs and lower demand for their goods and services. The sectors of the "very high" risk category includes the oil and gas, chemicals, metals and mining sectors and will require significant investment over the next few years to adapt their business models and transition to a low-carbon economy. As for the chemicals industry with also high risks because of the creation of toxic raw materials in production process, they will also be vulnerable to legal liabilities and rising costs from increasingly stringent regulatory agencies. Thus, environmental factors are putting increasing pressure on the credit profiles of issuers and will continue to do so. For example, S&P downgraded the credit ratings of Exxon Mobil, Chevron and ConocoPhillips in February 2021, citing the growing risk of energy transition due to climate change and greenhouse gas emissions (MorningStar, 2021).

From 2021 coal companies are facing difficulty placing Eurobonds and stocks at a rate acceptable to companies. The problem here is both the decreasing number of possible investors

and the fact that international banks also prefer to avoid providing financing to this sector, as banks also face pressure from investors and regulators. So recently 115 investors representing \$4.2 trillion sent letters to major banks, including JPMorgan Chase and Deutsche Bank, urging them to strengthen their climate and biodiversity strategies, demanding they divest from coal financing by 2030, meaning that companies from this industry will be unable to attract debt to finance extraction process (ShareAction, 2021). UniCredit Bank also recently announced stop financing new oil projects, banning support for new research and oil expansion and phasing out coal financing by 2028 (UniCredit, 2023). Recently, there was a precedent with oil giant, Royal Dutch Shell, when court decision pushed company to decrease its carbon emissions by 45% by 2030 (CNN Business, 2021). This case could pave the way for similar cases to be brought in other countries, forcing oil companies to reduce fossil fuel production. What, on the other hand, would this mean for the company and for the shareholders? That the company will be forced to invest in the construction of carbon-neutral production, while at the same time not being able to pay dividends to investors, because all the money will be used to comply with the decree on the reduction of emissions. Major insurance companies are also tightening their policies with regard to oil and gas policy insurance. For example, one of the biggest insurance company Allianz is going to stop issuing new property and casualty insurance contracts to finance oil and gas projects and will also stop extending existing ones (Reuters, 2022). Thus, for companies in hazardous industries, the negative impact will come from different sides - from a decrease in market value to increased costs and difficult access to capital.

ESG considerations are also becoming an increasingly important factor in the investment decision-making process. Many of the top asset management companies are now incorporating ESG factors into their investment and portfolio management. For example, BlackRock, one of the world's largest asset management companies, is actively embedding ESG strategies into client asset management (BlackRock, 2023). The company thinks that climate risk is an investment risk, and that integrating climate and sustainability considerations into investment processes can help investors build more resilient portfolios and generate higher long-term risk-adjusted returns. Vanguard, the second largest company, also believes that significant ESG risks, if left unchecked, can undermine the long-term value of companies, and that over time, well-managed companies, including those that employ effective methods to mitigate significant ESG risks, should outperform poorly managed ones (Vanguard, 2023). Since asset management companies often own large stakes in publicly traded companies, they will be able to strongly influence them: for example, to force companies to meet carbon neutrality requirements in shorter time periods, and

generally to influence the movement of capital from companies in environmentally unfriendly industries to more sustainable companies.

There are many different options for investing in sustainability now. The first is green bonds, used to finance climate projects. The green bond market was \$523 billion in 2021 (Climate Bonds Initiative, 2022), in 2022 - at \$487 billion – less, because of the difficult macroeconomic circumstances that continue to put pressure on global debt issuance in general. The second way is to invest in equity - for example, invest in ESG ETFs. These funds invest in companies that meet specific ESG criteria, such as minimizing their carbon footprint, having strong labor practices and following sustainable practises. Current research papers confirm that mutual ESG funds are also not inferior to conventional funds in terms of return and do not charge higher costs (Curtis et al., 2021). According to MSCI data, the MSCI World ESG Leaders Index has outperformed the MSCI World Index over the long-term. For example, over the past five years, the MSCI World ESG Leaders Index has had an annualized return of 9.10%, compared to 8.69% for the MSCI World Index, at the same time with lower annualized volatility (MSCI, 2023).

Banks also participate in the green transition. In 2019 the Principles for Responsible Banking (PRB) initiative was launched, which aims to ensure that banks adhere to the most ethical and responsible practices in their operations (UN environment programme, 2019). These principles also require the integration of ESG products into the banking business' operations. For example, providing special deposits and loans for clients engaged in environmental activities and other aspects of sustainable development. However, many financial institutions still lack a comprehensive approach to integrating ESG data into their existing system (McKinsey Digital, 2023). In the near future, the banking system will face new challenges, such as incorporating funded emissions and climate risk models, climate stress tests and climate-adjusted ratings. This data will need to be built into existing processes, such as loan approval and decision-making. And banks will need to adopt to new regulatory requierements and adjust their data architecture, as well as their strategy for managing and integrating ESG into their workflow.

Companies also can benefit from the transition to a sustainable economy. Organizations that pay attention to ESG have higher profitability - namely, higher profit growth and EBITDA margins (Bain&Company, 2023). Moreover, the recent study found that firms with more female senior executives perform better. Companies in the study that emphasize ethics, environmental stewardship and labor practices in their supply chains have 3-4% higher profitability than those that do not. One more report also says that companies around the world that place a high value on ESG had significantly higher revenue between 2019 and 2022 than those companies that openly ignore its importance (revenue growth of 9.7%, compared to 4.5% for those who did not accept

ESG) (Capital Monitor, 2022). Overall, revenues for companies that used ESG factors grew by \$3.1 trillion, consisting of \$2.1 trillion in USA, \$930.5 billion in Europe and \$58.8 billion in Australia. There are many successful examples of companies, incorporating sustainability in their operations. For example, Microsoft is making active steps to become carbon negative by 2030 with a two-year agreement to bury 12,000 tons of carbon dioxide in the ocean depths. Nestle also has committed to sourcing 100% of its sustainably by 2025 and is working to reduce greenhouse gas emissions throughout its value chain (ESG Today, 2023).

As the demand for ESG products grows, so does the demand to provide quality ESG data. While methodologies for assessing financial indicators have been developed and tested long ago, procedures for assessing environmental, social and governance indicators are still new and have not yet passed the test of time. There are already many rating agencies evaluating a firm's non-financial risks, using their own methodology and data. For example, S&P Global ESG assigns a score from 0 to 100 to companies based on publicly available information and company responses from the questionnaire (PwC, 2023). The MSCI ESG Rating is more designed to measure a company's resilience to long-term industry material ESG risks. The methodology helps identify industry leaders with a AAA score and laggards with a CCC score based on their exposure to ESG risks using sustainability reports and media data. There are many other significant players such as Sustainalytics, Refinitive, Bloomberg, etc. While the global credit rating market is highly concentrated, the ESG rating market is in process of consolidation. In the report Rate the Raters was found that the correlation of ratings between the most prominent agencies was insufficient, meaning that ESG ratings are not equally reflect ESG performance, making it difficult for decision-makers to identify outperformance and laggards (Berg et al., 2019). Reasons for such divergences are the different metrics included in calculation of rating by different agencies or different weights attributed to rating calculation. Combining and standardizing these ratings can improve the transparency and credibility of ESG factors assessments. This can be achieved by creating a common set of criteria or standards, developing common guidelines and regulations from governance bodies.

Thus, ESG is becoming an increasingly important topic for companies. It affects all areas of business - from production and distribution of goods to investor relations – and affects all industries. Companies not paying sufficient attention to ESG factors may encounter a number of problems in the near future, which may affect their long-term sustainability and profitability. At the same time, companies that integrate ESG factors into their business plan and their corporate culture can improve the competitiveness and sustainability of their business in the long run.

1.3 THE RELATIONSHIP BETWEEN ESG AND PERFORMANCE: LITERATURE REVIEW AND HYPOTHESES STATEMENT

Above, we discussed possible mechanisms for the impact of ESG criteria on the value of the company. Now we will try to review research papers exploring the impact of ESG on financial performance and try to observe the direction of its impact.

There are two types of financial performance indicators: accounting measures such as ROE, ROA, ROCE, cost of equity, etc. and market indicators such as Tobin's Q (Ramic, 2019). The first research paper devoted to the search for the relationship between environmental pollution and the profitability of the company did not find a relationship, although it was assumed that the more conscious a company is in environmental matters, the less profitable it is (Bragdon, Marlin, 1972) (Table 3). At the same time, another study by Moskowitz showed that there is a positive relationship (Moskowitz, 1972). Despite the fact that a lot of time has passed, the topic of the direction of ESG influence is still disputable and not clear. The study of global sustainable companies from 16 countries identified the higher financial performance measured by ROA, profit before tax and cash flow from operations for companies with better sustainability practices (Ameer, Othman, 2012). What is more, companies with higher CSR levels generated higher returns during the crisis of 2008-2009 and had higher profitability margins and sales growth than the companies with low level of CSR, and this trend even continued in the post-crisis period (Lins, Servaes, Tamayo, 2017). Disclosure of CSR information may also increase the profitability of companies with low institutional ownership (Whetman, 2018). The study of USA S&P 500-listed firms also demonstrated the higher operational and financial ratios such as Tobin's Q, ROA and ROE for firms with higher ESG rating (Alareeni, Hamdan, 2020). The positive correlation between ESG scores and financial performance was also identified in many other studies (Yu, Zhao, 2015; Deng et al., 2013; Dalal, Thaker, 2019).

However, some studies revealed negative relationship associated with ESG and companies' performance. In the research of Detre in agricultural sector the announcement of joining to the Dow Jones Sustainability Index membership was followed by the fall in the share price of these firms. Authors explain this by the meeting the short-term investors expectations for the decline of companies values due to the increased costs (Detre, Gunderson, 2011). Another study confirmed previous results, also identifying a negative relationship between CSR and the company's financial indicators (López, Garcia, Rodriguez, 2007). It is primarily explained by the fact that some companies do not correctly allocate the budget for new assets aimed at increasing sustainability. The company may also incur higher costs in the first years of the transition to the new CSR practices, which is associated with a change in the allocation of resources and new costs for

pollution prevention. The conclusions of another study also state that firms with higher indicators of social efficiency, as a rule, receive lower profits, which, in addition to the theory of risks and cost growth, can also be explained by behavioral patterns, such as the desire of investors not to profit from socially significant investments, but to make these investments from charitable motives, without expecting an increase in returns (Brammer, 2006).

It is also interesting to consider how three ESG pillars may affect the performance of companies individually. According to Porter (1995), reducing the negative impact on the environment by companies contributes to the growth and development of innovations, which allows using energy efficiency to reduce costs and drive productivity increase. Other studies, on the contrary, show that firms with higher level of environmental pillar have lower profitability due to various types of new restrictions, such as environmental laws, ESG taxonomy regulations or additional taxation on the consumption of limited resources (Walley, Whitehead, 1994). That is why the results in the field of environmental criteria of ESG may be mixed, indicating both positive influence (Murray et al., 2006, San Ong et al., 2014) and negative (Chiong, 2010, Smith et al., 2007).

The positive influence of social pillar on financial performance was also found in some studies. It was identified that ROA, ROE, profit margin and Tobin's Q were positively associated with the customers' level of satisfaction and loyalty in bank industry that again may be explained by the development of company's reputation and corporate culture (Eklof, 2018). This, in turn, positively influence market competitiveness, contributing to the possibility of setting higher price and getting higher profit. This direction of influence has been confirmed in other research papers (Verrecchia, 2001, Lev et al., 2010, Surroca et al., 2010, Kim et al., 2013), however, some studies have also provided the evidence of negative (Fisher-Vanden, Thorburn, 2011) and neutral relationship (McWilliams, Siegel, 2001, Patten, 1991, Waddock and Graves, 2000).

After the crisis of 2008-2009 there has been a growing trend towards increasing importance of information disclosure and information transparency, for which the governance pillar is responsible. Poor management has even been cited as one of the causes of the financial crisis (Nollet et al., 2016). In the meantime, well-established quality management may largely affect financial and non-financial performance indicators through the reduction of information asymmetry and solving the agency problem (Merza Radhi, Sarea, 2019). Thus, Bauer (2010) found that corporate governance has a positive effect on real estate companies in the United States. Hussein and Kamardin (2016) also studied the impact of corporate governance practices on Fortune 500 global corporations and concluded that there is a significant positive relationship between the governance pillar and financial performance. In addition, strong influence may occur

through the development of diversity policy within the board of directors - in terms of gender, age, or ethnicity (Erhardt et al., 2003). This is primarily due to increased representation, which allows the company to understand and meet the needs of various stakeholders.

Table 3. Literature review summary on ESG relationship with financial performance and value of firms.

	Positive relation	Negative relation	No relation
Financial performance	Positive correlation between CSR awareness and financial performance (Moskowitz, M. R. 1972)	Joining to the Dow Jones Sustainability Index (DJSI) - the fall in the share price (Detre, Gunderson, 2011)	Profitability of the company is not associated with the level of pollution (Bragdon, Marlin, 1972)
	Higher CSR – higher profitability margins and sales growth during the crisis (Lins, Servaes, Tamayo, 2017)	The higher CSR – the lower the profit before tax (López, García, Rodríguez, 2007)	In the Korean corporations the environmental score shows negative relationship with FP, positive with governance pillar and non-significant with the social (Han, 2016)
	Disclosure of CSR – higher profitability of companies with low institutional ownership (Whetman, 2018)	The higher CSR – the lower stock returns (Brammer, Brooks, Pavelin., 2006)	
	Higher ESG – higher Tobin’s Q, ROA, ROE (Alareeni, Hamdan, 2020, Yu, Zhao, 2015; Deng et al., 2013; Dalal, Thaker, 2019)		
	Companies with higher sustainability practices have higher ROA, profit before taxation and OCF (Ameer, Othman, 2012)		
Environmental pillar	Studies which assess the increase of costs due to the introduction of environmental regulation pays attention to compliance costs, ignoring innovation benefits – that contrary – increase productivity and decrease costs (Porter, 1995)	More environmental laws, regulations and additional taxation – higher costs (Walley, Whitehead, 1994)	There’s no difference between DJSI group and non-DJSI group in terms of ROA, ROE (Chiong, 2010)
	Companies with higher returns have higher level of environmental information disclosure (Murray et al., 2006)	Profitability indicators (ROA, ROE) are negatively associated with environmental disclosure in Malaysia (Smith et al., 2007)	Weak influence of environmental disclosure on ROA, return on sales and Tobin’s Q (Elsayed, Paton, 2005)
	Environmental efficiency has a positive correlation with ROA and ROE (San Ong et al., 2014)		
Social pillar	ROA, ROE, profit margin and Tobin Q are positively associated with the customers’ level of satisfaction and loyalty in bank industry (Eklof, 2018)	Members of EPA’s Climate Leaders program generally had lower stock returns (Fisher-Vanden et al., 2011)	When controlling on R&D investments – neutral impact of SCR on financial performance (McWilliams, Siegel, 2001)
	Information disclosure in social welfare context decrease the data		Social disclosure is not associated with profitability

	asymmetry and increase efficiency (Verrecchia, 2001)		indicators (Patten, 1991, Waddock et al., 2002)
	The revenue increase is strongly associated with increase of charitable contributions (Lev et al., 2010)		
	The connection between CSR and financial performance is primarily due to intangible resources (reputation, human capital) – mediator (Surroca, 2010)	Before Sarbanes-Oxley Act (increase restrictions to accounting) negative relationship between ROE, ROA and Corporate governance, and positive relation after the introduction of Sarbanes-Oxley Act (Bhagat, Bolton, 2009).	Composition of board of directors has no influence on financial performance (Hermalin, Weisbach, 1991)
Governance pillar	The higher the governance rate – the higher ROE, ROA and Tobin’s q (Bauer et al., 2010)		
	Fortune 500 global corporations have significant positive relationship between the governance pillar and financial performance (Hussein, Kamardin, 2016)		
	The positive influence of diversity to financial performance (Erhardt et al., 2003)		

Numerous studies have examined the relationship between financial indicators and ESG rating factors and, as mentioned earlier, the results of existing studies are contradictory. Many studies show that providing superior ESG performance negatively correlates with a firm's financial performance. However, there are also recent studies that have revealed a significant positive relationship between the effectiveness of ESG and financial performance. Such a positive relationship is mainly supported by the Legitimacy and Social Contract theory. According to them, by investing in ESG through sustainable product development and involvement in social initiatives, companies can improve their reputation in the market, leading to increased demand for their products and the opportunity to charge higher prices against competitors, which then positively affects the financial performance of the company. Based on these theories, we propose the following hypotheses about the relationship between ESG and the financial performance of the company:

Hypothesis 1: ESG scores are positively related to companies’ financial performance

Hypothesis 2: Companies with an above-median ESG score have better financial performance than companies with a lower than median score

In addition, it would be interesting to study the impact of ESG on industrial companies separately, since they are currently undergoing the greatest changes. For example, the Glasgow Financial Alliance for Net Zero (GANZ), a global coalition of leading financial institutions, has committed to accelerate the decarbonization of the economy and bring their portfolios to zero by 2050, many countries also declared their desire to achieve carbon neutrality by this year (The Paris Agreement, 2016). ISSB's intention to standardize ESG reporting and integrate climate disclosure with financial disclosure will also have a huge impact. Instead of today's voluntary and often misleading disclosure of carbon emissions, companies' financial statements will contain verified and guaranteed emissions, climate policy and forward-looking statements (Energy Transition and Industrial Sustainability, 2022). This transformational acceleration will put the strongest pressure on industrial companies. The industry of metallurgy, especially representatives of the ferrous metallurgy segment, also has the risks, related to lower profitability, because of the introduction of a Carbon Border Tax - the tax which will depend on carbon dioxide emissions from the production of imported goods and on the price of CO₂ in Europe (Council of the EU, 2022). On the other hand, these companies can get the opportunity to increase productivity and reduce costs due to the transition to energy efficiency and digitalization. In addition, the demand for the clean energy products are expected to increase, for example, "metals of the future" such as lithium, nickel, cobalt, used in innovative energy generation, storage technologies, space systems and other advanced developments. Therefore, it is important to study how ESG transformation affects these companies already now:

Hypothesis 3: ESG scores have stronger influence on performance of companies from industrial sector

CHAPTER 2. EMPIRICAL ANALYSIS

2.1 DATA

The panel data required for analysis will be taken from Bloomberg – the largest database with the financial data for companies around the world - for the period from 2015 to 2021. We take the data for companies, included in S&P500 index - stock index, the basket of which includes 500 USA joint-stock companies with the largest capitalization and traded on the largest American stock exchanges from various industries (Table 4). We will also delete the banking sector from the list of companies, as they have different measures of financial performance, the dataset will be also corrected for outliers with winsorization at 1%. The two key variables will be required for the relationship analysis which are the variables of financial performance (dependent variables) and ESG score (independent variable).

Table 4. Industries description from Bloomberg database.

	Description
Health Care	Involved in medical equipment, pharmaceuticals, biotechnology and healthcare services (e.g Abbott laboratories, Universal Health Services, Biogen Inc)
Industrials	Manufacture and distribute industrial products and services, such as aerospace, defense, construction and engineering companies (e.g Boeing Co, American Airlines Group Inc, General Electric Co)
Consumer Discretionary	Produce or sell products that are not essential for daily living but are purchased by consumers as luxury items (automobile manufacturers, restaurants) (e.g Tesla Inc, Amazon.com Inc, Ford Motor Co)
IT	Produce or provide technology hardware, software and services (e.g Apple Inc, Mastercard Inc, Oracle Corp)
Consumer Staples	Produce or sell essential products that are used on a daily basis and are necessary for daily living (food and beverage, household product companies) (e.g Coca-Cola Co, Colgate-Palmolive Co, Estee Lauder Cos Inc)
Utilities	Provide essential services, such as electricity, gas and water utilities (e.g Duke Energy Corp, American Electric Power Co Inc, Dominion Energy Inc)
Materials	Extract, process, and distribute raw materials, such as metals, minerals and chemicals (e.g DuPont de Nemours Inc, Dow Inc, Vulcan Materials Co)
Real Estate	Involved in the ownership, development, and management of real estate properties (e.g American Tower Corp, Camden Property Trust, Crown Castle Inc)

Energy	Involved in the production, exploration, and distribution of oil, gas (e.g Coterra Energy Inc, Marathon Oil Corp, Targa Resources Corp)
---------------	---

Communication Services	Provide communication and media services to consumers and businesses (e.g Twitter Inc, Walt Disney Co, Netflix Inc)
-------------------------------	---

2.2 METHODOLOGY

As a proxy of the financial performance of the company and as a dependent variable in our models several indicators have been selected. As a characteristic of market performance, Tobin's Q will be applied, as of accounting performance – ROE (Table 5). Tobin's Q is a good indicator of market value over the intrinsic value of the firm (Ademi, Bejtush et al, 2022). ROE is chosen to observe if there is a more profit generated over the capital invested, reflecting how sustainable business practices and effective corporate governance can result in higher profitability (Alareeni, Hamdan, 2020).

As an explanatory variable ESG score will be applied. There are many agencies that provide ESG ratings, but to ensure uniformity of financial data sources and ESG data for the same sets of companies and to minimize inaccuracies in measurement, we would like to use the Bloomberg ESG estimate (Bloomberg, 2023). This is an integrated assessment on three pillars: environmental - which includes estimates on emissions, innovation, resource use; social - which includes the scores from human rights, product responsibility, workforce and community fields and governance - which is comprised of estimation on management, shareholders, CSR strategies. These subcategories are then grouped and weighted to obtain an E, S, G scores individually. Bloomberg obtains data from different sources including company disclosures, industry association reports, government regulatory documents and news articles. Examples of factors that Bloomberg considers include the following: Climate change mitigation and adaptation, Energy efficiency, Pollution reduction and waste management, Labor practices and human rights, Diversity and inclusion, Consumer protection, Board structure and independence, etc. Then Bloomberg assigns weights to each factor based on its perceived importance to investors and stakeholders. The weights are determined by a combination of expert opinions, academic research and public opinion surveys. The scores are then aggregated into an overall ESG score for each company.

There are also some variables that need to be included in the model to control other possible external effects to financial performance, such as the firms' size, revenue growth rate, liquidity

and leverage ratios. The financial leverage ratio is added because it can reduce the profitability of the company, resulting from increase in borrowed funds and interest payable (Nguyen, Hoang, et al, 2022), or, on the contrary, to drive the indicators in the case of a favorable interest rate and the opportunity to earn more on these funds. A higher liquidity ratio will indicate that the company has better coverage of outstanding debts. The increase in revenue growth rate and larger firms in terms of assets are expected to show better performance results as well (Nazarova, 2022).

Table 5. Model variables.

Variables	Formulas
<p style="text-align: center;">Dependent variables</p> <p style="text-align: center;">Tobin's Q</p> <p style="text-align: center;">ROE</p>	$\frac{\text{Market Value of Equity} + \text{Book Value of Debt}}{\text{Total Assets}}$ $\frac{\text{Net income}}{\text{Shareholders' equity}}$
<p style="text-align: center;">Independent variables</p> <p style="text-align: center;">ESG score</p>	<p style="text-align: center;"><i>from the Bloomberg database</i></p>
<p style="text-align: center;">Control variables</p> <p style="text-align: center;">Size</p> <p style="text-align: center;">Leverage</p> <p style="text-align: center;">Liquidity</p> <p style="text-align: center;">Growth</p>	<p style="text-align: center;">$\ln(\text{Total Assets})$</p> $\frac{\text{Total Assets}}{\text{Total Equity}}$ $\frac{\text{Current Assets}}{\text{Current Liabilities}}$ $\frac{\text{Sales } t - 1}{\text{Sales } t - 2}$

Before constructing a regression model, the difference-in-means will be analyzed. Our sample will be divided into two groups: companies with an ESG score above the median and companies with a score below the median. Then a t-test will be applied to determine whether there is a difference in the financial performance of companies with unequal levels of ESG integration.

Then regression analysis will be used. We define following types of models:

$$FirmPerformance_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 S_{i,t} + \beta_3 G_{i,t} + \beta_i ControlVariables_{i,t} + \varepsilon_{i,t}, \quad (1)$$

$$FirmPerformance_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_i ControlVariables_{i,t} + \varepsilon_{i,t}, \quad (2)$$

$$FirmPerformance_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_i ControlVariables_{i,t} + \varepsilon_{i,t}, \quad (3)$$

$$FirmPerformance_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_i ControlVariables_{i,t} + \varepsilon_{i,t}, \quad (4)$$

where *FirmPerformance* is a dependent variable defined by Tobin's Q, ROE; *E*, *S*, *G* is an explanatory variable for the overall model and *E*, *S*, *G* scores separately for individual models. Control variables also will be gradually added to the model, such as firms' *Size*, *Leverage*, *Liquidity*, *Growth*.

We will use the Pooled OLS, Fixed effects (FE) and Random Effects (RE) models and then evaluate which model brings the most accurate effects by the Breach - Pagans and the Hausmann tests.

2.3 DESCRIPTIVE STATISTICS AND SAMPLE ANALYSIS

Table 6 presents the general statistics of financials and ESG scores for the last 7 years. From the data reviewed it can be said that companies from S&P500 index were overvalued in accordance with its Tobin's Q value exceeding the 1. Even a smaller part of the sample - the quarter of firms are overvalued, which means that the value of the firm's shares is higher than the replacement cost of its assets. The average ROE of companies is also quite high and positive, identifying higher returns for investors.

In the meantime, the mean values of Environmental and Social components are quite low across the years – 2.61 and 2.68 respectively (the maximum possible value of each pillar's score is 10). However, the Governance score is much higher – 7.04 out of 10, which can be explained by stricter requirements to effective governance since the introduction of Sarbanes - Oxley Act in 2002 - the act which determined the rights of shareholders, effective management rules, interests of stakeholders, duties and professional ethics of the Directors' Board and disclosure requirements (Mitchell, 2002). Moreover, all companies are public with stricter requirements to governance disclosure.

Table 6. Summary statistics

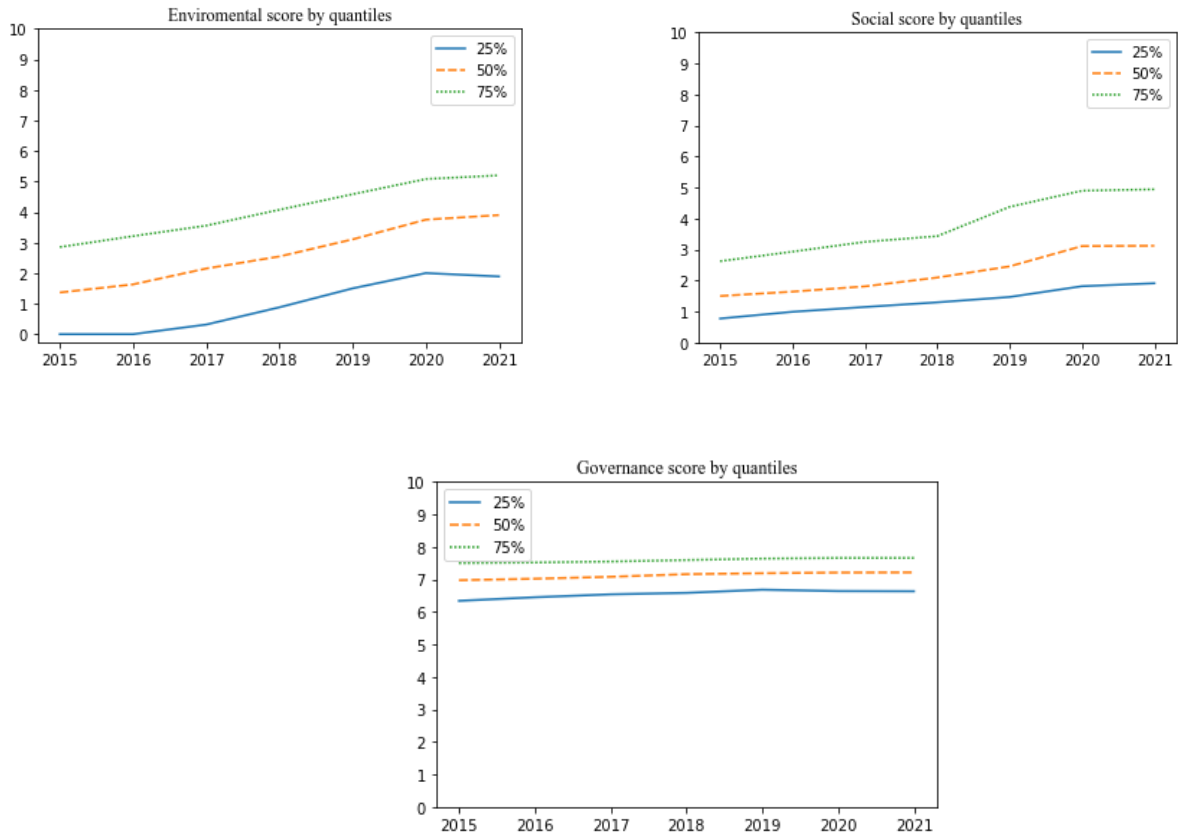
Variable	Obs	Mean	Std. Dev.	25%	50%	75%	Min	Max
Dependent variables								
Tobin's Q	2,889	2.82	2.17	1.49	2.09	3.31	0.55	21.66
ROE	2,770	23.19%	47.37%	8.56%	16.62%	28.18%	-315.62%	1048.62%

<i>Explanatory variables</i>								
E pillar	2,585	2.61	2.04	0.69	2.50	4.17	0.00	9.26
S pillar	2,585	2.68	1.91	1.30	2.11	3.80	0.00	9.57
G pillar	2,774	7.04	0.78	6.57	7.12	7.60	2.34	9.13
<i>Control variables</i>								
size	2,974	35.83	56.52	7.43	17.52	39.20	0.16	551.67
revenue growth	2,545	10.2%	55.5%	0.54%	6.4%	14.8%	-100%	2199.1%
liquidity	2,791	1.78	1.40	0.10	1.42	2.09	0.14	18.18
leverage	2,825	6.58	53.08	2.00	2.68	3.80	1.09	1813.00

Table 7 provides more detailed information on average financial indicators and scores by sector and time periods. At the very first sight, we can see how the coronavirus crisis has affected the economy of most industries. The biggest drop was in the energy sector - which is due to the strongest drop in energy demand and oil prices during the pandemic (negative ROE and negative revenue growth are identified). Consumer spending, the main source of economic activity, also collapsed, which led to a reduction in personal services, especially travel, entertainment and food, decreasing the financials of Consumer Discretionary sector (McKinsey Global Institute, 2021). Some falls in indicators were also observed in such sectors like Materials, Real Estate, Industrials and Communication Services. However, this 2020 negative trend began to recover and led to an increase in indicators in almost all sectors in 2021.

Although we have seen significant declines in financial indicators for 2020, the same cannot be said for ESG indicators. In general, ESG indicators for all industries have gradually increased over time. In 2015 the half of the companies had only 1.37 in E rating and 1.50 in S rating, while by the end of 2021 these numbers increased by more than 2 times (3.90 in E pillar and 3.12 in S pillar) (Picture 1). The worst-performing group (25% quantile) also improved their scores by 2021, but most of the companies which were the part of the lowest quantile in 2015 remained within their quantile in 2021 as well (about 70% of companies stayed within lowest quantile group), indicating that they were not able to increase their E and S scores significantly. Such companies can be classified as “defenders”, struggling with the implementation of ESG principles in their operations. The majority of these companies are in the HealthCare industry (about 52% of the total within the sector).

Picture 1. E, S, G scores by quantiles groups



In table 7 we also can observe small drops in E, S, G components for some industries (HealthCare, Utilities, Real Estate), and the decline in indicators was detected in 2021, and not in 2020 as expected, which is possible due to the delayed effect of the deterioration of firms' performance during the crisis. The Governance score is more or less the same for companies in all sectors, varying between 6-7 average points. However, there are certain differences in the assessments of the environmental and social components.

The highest values of the Environmental score have companies in the Materials Sector, which include chemical production companies (5.20 in 2021). Even though companies are under pressure to introduce more environmentally friendly products and business practices, companies have managed to gradually increase their Environmental score by 2021, which may be due to the introduction of strategies to reduce greenhouse gas emissions, decrease plastic waste by recycling them into new products and using more renewable raw materials, such as biobased raw ones. At the same time, the lowest level of Environmental factor is observed in the Real Estate sector (3.19 in 2021), which is associated with severe environmental pollution during construction - water and air pollution, high energy consumption, dangerous construction waste. Also low values are observed in Consumer Discretionary sector (2.94 in 2021). In general, in 2015 there were only 4% of companies with environmental score rating higher than average (above 5), in 2021 number of such companies increased to 12.4%. Although there is little progress in the environmental score

value across the considered time periods, companies' progress in achieving sustainability is still low.

The highest value of Social score is observed in the Real Estate sector (5.82 in 2020). That is, if in terms of the negative impact on the environment, construction companies are not yet able to reduce the negative impact, then in terms of social - they are achieving quite concrete success. This is primarily due to the influence of consumer demand - the current needs of tenants and residents are quite specifically determined by the choice of the most environmentally friendly place to live. From the point of view of real estate, this can mean the construction of affordable green and eco-friendly infrastructure, the creation of public projects, as well as the support of other local business and charitable organizations. Also, high values of Social score are observed for enterprises of the Utilities sector, which is one of the most important sectors for providing public services (5.17 in 2020). At the same time, telecommunications companies received the lowest social scores (2.09 in 2020), which may be due to the constantly occurring cases of data leakage, and since telecommunications companies are responsible for the dissemination of information, the inability to protect basic data confidentiality reduces customer confidence and increases reputational and regulatory risks, decreasing social score respectively (Zhang, Slijkerman, 2022). The total percentage of companies with a social score above 5 increased from 4.6% in 2015 to 11.5% in 2021.

From the above descriptive statistics, we can conclude that companies from the S&P500 index do not show excellent ESG performance, even though over time there has been a slight increase in these indicators. But possible effects and the extent to which the differences in the ESG and financial indicators are interrelated will be explored in subsequent chapters.

Table 7. Descriptive statistics on mean values by industries and time periods

<i>Variable</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
<i>Health Care</i>							
Tobin's Q	3.13	3.22	3.37	3.39	3.51	3.94	3.72
ROE	17.80%	21.23%	15.06%	18.59%	22.52%	23.67%	37.98%
revenue growth		14.9%	11.3%	9.5%	9.9%	27.0%	55.3%
liquidity	2.32	2.30	2.28	2.25	2.06	1.98	2.32
leverage	3.14	3.04	2.85	3.21	10.01	3.86	3.14
E pillar	1.61	1.74	2.22	2.38	2.68	3.11	2.79
S pillar	1.23	1.42	1.67	1.82	2.21	2.56	3.16
G pillar	6.83	6.92	6.97	6.94	7.00	7.00	6.99
<i>Industrials</i>							
Tobin's Q	2.19	2.47	2.67	2.59	2.73	2.88	2.94

ROE	32.17%	34.33%	45.53%	44.91%	31.32%	19.40%	27.43%
revenue growth		1.4%	9.1%	9.6%	1.8%	-6.6%	17.0%
liquidity	1.67	1.63	1.64	1.60	1.59	1.87	1.71
leverage	6.85	4.65	7.68	7.42	3.55	3.66	14.20
E pillar	1.50	1.65	2.01	2.50	2.83	3.23	3.90
S pillar	2.33	2.37	2.47	2.66	3.37	3.72	3.92
G pillar	6.93	6.95	7.08	7.14	7.21	7.14	7.23
<i>Consumer Discretionary</i>							
Tobin's Q	2.85	3.04	3.26	3.29	3.22	3.43	3.31
ROE	23.12%	23.07%	26.49%	33.91%	39.01%	27.18%	28.88%
revenue growth		12.2%	7.1%	9.2%	4.8%	-9.0%	17.8%
liquidity	2.12	2.00	2.00	1.96	1.96	2.00	1.89
leverage	3.10	12.84	3.63	4.06	12.58	5.73	25.05
E pillar	1.13	1.41	1.85	1.99	2.37	2.78	2.94
S pillar	2.02	2.16	2.41	2.54	3.11	3.36	3.30
G pillar	6.68	6.86	6.88	7.04	7.10	7.04	7.18
<i>IT</i>							
Tobin's Q	2.78	2.97	3.53	3.84	4.31	4.94	4.73
ROE	18.38%	13.67%	20.38%	26.38%	31.49%	27.46%	34.65%
revenue growth		10.0%	14.1%	13.6%	6.2%	6.7%	20.6%
liquidity	2.33	2.32	2.21	2.04	2.00	2.01	1.89
leverage	4.76	25.95	2.97	3.05	2.86	2.97	3.38
E pillar	1.53	1.70	1.99	2.39	2.94	3.45	3.68
S pillar	1.33	1.52	1.64	1.81	2.06	2.62	2.70
G pillar	6.86	6.90	6.84	6.91	7.04	7.11	7.10
<i>Consumer Staples</i>							
Tobin's Q	3.03	3.09	2.99	2.89	2.96	2.85	2.95
ROE	40.51%	39.91%	36.33%	33.99%	28.34%	49.69%	49.08%
revenue growth		1.9%	6.5%	3.7%	5.3%	-0.4%	7.8%
liquidity	1.48	1.32	1.19	1.13	1.13	1.31	1.28
leverage	6.65	3.89	5.53	6.45	64.06	7.37	7.55
E pillar	2.60	3.02	3.10	3.53	4.13	4.39	4.40
S pillar	1.90	2.12	2.28	2.53	2.79	3.20	3.77
G pillar	7.11	7.17	7.14	7.18	7.22	7.31	7.44
<i>Utilities</i>							
Tobin's Q	1.23	1.26	1.26	1.34	1.38	1.29	1.29
ROE	4.24%	3.54%	7.40%	9.21%	7.11%	8.36%	10.74%
revenue growth		-2.9%	3.8%	3.6%	0.0%	-3.1%	16.6%

liquidity	0.83	0.75	0.73	0.69	0.68	0.81	0.84
leverage	4.06	4.55	5.39	4.24	6.02	4.44	4.38
E pillar	2.57	2.91	3.27	3.57	4.18	4.38	3.92
S pillar	3.80	4.19	4.47	4.50	4.79	5.17	4.54
G pillar	7.50	7.58	7.46	7.52	7.56	7.63	7.28
<i>Materials</i>							
Tobin's Q	1.76	2.10	1.98	1.80	1.83	2.05	2.08
ROE	19.27%	18.63%	32.09%	22.33%	14.08%	13.39%	31.80%
revenue growth		-2.0%	6.6%	19.5%	-0.7%	-6.0%	28.4%
liquidity	1.85	1.97	1.96	1.80	1.69	1.91	1.72
leverage	3.68	3.90	4.01	3.34	2.97	2.99	3.92
E pillar	2.59	2.85	3.18	3.57	3.78	4.38	5.20
S pillar	2.86	3.27	3.67	3.48	4.03	4.23	4.77
G pillar	7.03	7.21	7.25	7.25	7.37	7.41	7.34
<i>Real Estate</i>							
Tobin's Q	1.93	1.97	1.83	1.96	2.09	1.93	2.14
ROE	10.79%	12.14%	9.70%	11.83%	13.48%	9.63%	14.66%
revenue growth		9.8%	10.7%	20.4%	4.7%	1.5%	13.5%
liquidity	1.57	1.07	1.47	1.41	1.48	1.11	1.66
leverage	3.19	3.03	2.82	2.83	3.00	3.24	3.42
E pillar	0.89	1.29	1.61	2.15	2.61	3.19	3.19
S pillar	1.92	2.09	2.69	3.71	5.31	5.82	5.52
G pillar	6.83	6.77	6.86	7.03	7.08	7.14	7.11
<i>Energy</i>							
Tobin's Q	1.31	1.62	1.64	1.45	1.28	1.39	1.60
ROE	-11.48%	-3.18%	5.71%	10.25%	0.22%	-25.09%	14.56%
revenue growth		-15.1%	32.0%	28.3%	-1.1%	-26.3%	71.1%
liquidity	1.56	1.92	1.28	1.34	1.25	1.34	1.27
leverage	4.23	5.22	2.65	2.35	2.42	3.46	3.10
E pillar	2.46	2.65	2.96	3.34	3.94	4.48	4.55
S pillar	2.80	3.14	2.29	3.61	3.88	4.16	4.93
G pillar	7.07	7.11	7.16	7.20	7.23	7.24	7.11
<i>Communication Services</i>							
Tobin's Q	2.15	2.23	2.46	2.30	2.13	2.89	2.53
ROE	17.25%	18.73%	20.24%	19.18%	15.72%	13.77%	20.03%
revenue growth		20.4%	11.3%	17.4%	6.5%	2.4%	23.3%
liquidity	2.06	2.09	1.71	1.64	1.74	1.64	2.06
leverage	4.23	4.02	3.62	3.59	4.86	3.37	4.23

E pillar	1.29	1.53	1.73	2.01	2.41	3.76	3.84
S pillar	0.78	0.83	0.99	1.07	1.41	2.09	2.23
G pillar	6.39	6.46	6.46	6.47	6.43	6.44	6.35

2.4 DIFFERENCE-IN-MEANS ANALYSIS

Before the regression analysis, t-tests were carried out, with the sample pre-divided into companies with an ESG score above the median and a score below it. This was done in order to see if there were differences in the average financial performance between low-scoring and higher-scoring companies.

Thus, the evaluation on the overall sample showed the following results: companies with higher ESG scoring are on average undervalued. This can be explained as follows - if an investor considers ESG in their investment strategies in terms of assessing a company's exposure to certain risks and considers the corresponding ESG risks, then companies with higher ESG ratings will have correspondingly lower risk levels (Schroders, 2021). And lower risk necessarily coincides with lower returns and lower spreads, leading to undervaluation accordingly (Table 8). In addition, companies that have a high ESG rating may have higher costs to implement social, environmental, and management practices than companies with a low ESG rating. This could result in a higher replacement value for their assets, which could reduce Tobin's Q value. Another possible explanation is that the group with high ESG can initially "self-select" companies that are dissatisfied with their valuation by the market (Tobin's Q) and seek to signal to it that they should be valued higher, through the implementation of some advanced ESG practices, which may subsequently lead to an increase in the market valuation.

According to the results, companies with higher ESG and presumably lower risk benefit from a lower cost of capital than companies with higher risk (in our case, these companies have higher leverage on average). In the meantime, the average lower liquidity identified among the companies with higher ESG might be explained by their relatively easier access to the capital market (Liu et al, 2022). At the same time, the results show that there is no significant difference in operating efficiency (ROE) for companies with higher and lower ESG scoring. Although this neutral effect does not hold when dividing the total scoring into 3 separate components. We see that companies with high G scoring had higher efficiency, but with the opposite effect for S pillar.

In terms of control variables, it was found that companies with higher ESG are, on average, larger in size, more leveraged, but less liquid and have lower revenue growth rates. Larger size of firms with higher ESG metrics may be explained by higher pressure from public to disclose more information about CSR from bigger firms (Lisin et al, 2021). The lower growth of revenue might

happen due to delayed effect of ESG introduction on profitability because of higher expenses during the first years of transition.

Table 8. Difference-in-means analysis for sample

	<i>ESG score</i>	<i>E score</i>	<i>S score</i>	<i>G score</i>
	<i>above-median</i>	<i>above-median</i>	<i>above-median</i>	<i>above-median</i>
Tobin's Q	<***	<***	<***	<***
ROE	-	-	<*	>**
size	>***	>***	>***	>***
leverage	>**	>**	>**	>*
liquidity	<***	<***	<***	<***
growth	<***	<***	<***	<***

*** p<0,01; **p<0,05; * p< 0,1

For industrial-based analysis, we see a similar dynamic - companies in most industries are undervalued (Table 9). No difference is found in Tobin's Q average for such sectors as Consumer Discretionary, Utilities, Materials and Communication Services. Companies of the IT sector with a higher ESG rating are overvalued in the market due to a higher E pillar, but maybe undervalued in terms of higher G score. This may be due to the fact that IT companies in general have a low carbon footprint because they have no manufacturing, making it easier for them to transition to an environmental agenda. But on the management side, they may have difficulty with the underrepresentation of women in leadership positions, as well as ethical issues. In the Consumer Staples sector, the undervaluation comes from the higher Social Pillar, while in Real Estate – from Governance, meanwhile in Health Care – from both. At the same time, undervaluation in Industrials and Energy is predominantly on all ESG pillars. Meanwhile, the ROE ratio is higher for companies with higher ESG ratings for the Health Care, IT, Utilities and Communication Services sectors, but lower for Energy and Materials. No difference was found for companies in the rest of the sectors.

However, t-test is considered a "rough" test, having some limitations. For example, it is typically used to detect only one dependent variable at a time, so they do not account for the influence of other factors on the relationship between the groups. Therefore, follow-up regression analysis is required to provide a more robust and comprehensive analysis. It can take into account multiple independent variables and help to identify the factors that may be influencing the relationship between the groups.

Table 9. Difference-in-means analysis for industries

	<i>ESG score</i>	<i>E score</i>	<i>S score</i>	<i>G score</i>
	<i>above-median</i>	<i>above-median</i>	<i>above-median</i>	<i>above-median</i>
<i>Health Care</i>				
Tobin's Q	<***	<***	-	<***
ROE	>***	>**	>**	<**
size	>***	>***	>***	>***
leverage	>***	>***	-	-
liquidity	<***	<***	<***	<**
growth	<***	<***	<*	<***
<i>Industrials</i>				
Tobin's Q	<***	<***	<***	<***
ROE	-	-	-	>**
size	>***	>***	>***	>***
leverage	-	-	>**	>**
liquidity	<***	<***	<*	<***
growth	-	-	<*	-
<i>Consumer Discretionary</i>				
Tobin's Q	-	-	-	-
ROE	-	>*	-	>***
size	>***	>***	>***	>**
leverage	>***	>***	>***	-
liquidity	<***	<***	>***	<**
growth	-	<***	>*	-
<i>IT</i>				
Tobin's Q	>**	>***	-	<**
ROE	>***	>***	>**	>***
size	>***	>***	>***	>***
leverage	-	-	-	-
liquidity	-	>**	>**	<***
growth	-	-	-	<***
<i>Consumer Staples</i>				
Tobin's Q	<*	-	<***	-
ROE	-	-	-	>***
size	-	<**	-	>***
leverage	-	-	-	>**
liquidity	<***	<*	<**	<***
growth	-	-	-	-

<i>Utilities</i>				
Tobin's Q	-	-	-	<***
ROE	>*	-	-	-
size	>***	>***	>***	-
leverage	-	-	-	-
liquidity	-	>*	-	<**
growth	-	<***	-	-
<i>Materials</i>				
Tobin's Q	-	>**	<***	<***
ROE	<***	-	<**	<*
size	>**	>*	-	>**
leverage	<***	<***	<***	<***
liquidity	>***	-	>***	>***
growth	<*	-	-	-
<i>Real Estate</i>				
Tobin's Q	<**	-	-	<**
ROE	-	-	-	<**
size	>***	>***	>***	-
leverage	-	-	-	-
liquidity	-	-	<**	>*
growth	<***	<**	<***	>**
<i>Energy</i>				
Tobin's Q	<***	<***	<***	<**
ROE	<*	<***	-	<*
size	>***	>***	>***	>***
leverage	<**	<**	<***	<*
liquidity	-	<**	-	<*
growth	<**	-	-	-
<i>Communication Services</i>				
Tobin's Q	-	>**	>***	<*
ROE	>***	>**	>***	>***
size	>***	>***	>***	>***
leverage	-	-	-	-
liquidity	-	>**	>**	<***
growth	-	-	>*	<***

*** p<0,01; **p<0,05; * p< 0,1

2.5 REGRESSION ANALYSIS RESULTS

At the beginning of the regression analysis, a Hausman test was conducted to determine whether there is a correlation between the random effect and the regressors. The test showed that for the general model with all regressors the FE model is more appropriate, since there is such a correlation, which means that the effect of time-invariant characteristics should be controlled for. As a result, we obtained the following outcome: increasing the E and S scores increases Tobin's Q, while all three components are responsible for ROE increase.

So, for example, an increase in the E rating by 1-point leads to an increase in Tobin's Q by almost 0.04 units, which means that positive changes in environmental component positively influences the investment attractiveness of the company (Table 10). A 1 point increase in the S rating also has a positive effect on Tobin's Q with an increase of 0.07 units. This influence might be also associated with the improvement of reputation and better investment attractiveness respectively. Moreover, companies that prioritize social responsibility and sustainability are often seen as more trustworthy and reliable, which can lead to increased customer loyalty and higher profits, what is more, companies that invest in sustainable practices may be more resilient to market changes and regulatory pressures, which can also contribute to higher Tobin's Q. Company's size as well improves Tobin's Q, indicating better brand recognition and reputation of big firms. From other variables no significant influence was found.

For the model with ROE, there was a strong significant effect of G pillar on ROE - a 1 point increase in G led to a 5.69 percentage point increase in ROE. This effect might come from the fact that highly qualified and transparent governance lead to better risk management and more effective decision making, leading to increase of Net profit margin. Effective governance can also foster stakeholder relationships, including employees, customers, and shareholders, which can create positive feedback loops and boost both Net profit margin and Assets turnover, ultimately increasing ROE (Kumalasari, Pratikto, 2018). ROE is also positively associated with increase in E and S factors: increase in the E factor is capable of increasing the ROE by 0.93 percentage points, and the S factor - by 1.47. At the same time, an increase in company size leads to decrease in ROE, indicating that large companies may not effectively utilize its resources by being slower in innovation and more bureaucratic. Leverage and revenue growth also have a significant positive effect on ROE, which follows from the Dupont formula.

At the same time, we see that the effect of E, S, G components separately significantly improve the performance of the companies, meaning that each component may be important on its own, when in combined effect it is outweighed by other factors. For example, companies may have strong environmental and social practices but weak governance, which can ultimately lead to

poorer performance. Or some companies may excel in one area, such as governance, but lag behind in others, which may limit its overall impact. In terms of the other variables, the effect is the same as in the general model. However, G score does not have influence on Tobin's Q even in individual model. It shows that G indicator affects mostly operational performance, but for market performance it is not the primary driver.

Table 10. A regression model for all industries

	Fixed effect model (FE)		Fixed effect model (FE)		Fixed effect model (FE)		Fixed effect model (FE)	
	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE
E score	0.041* (0.022)	0.936** (0.448)	0.063*** (0.020)	1.619*** (0.420)				
S score	0.066** (0.026)	1.470*** (0.531)			0.086*** (0.024)	2.098*** (0.499)		
G score	0.083 (0.069)	5.685** (1.351)					0.092 (0.065)	6.443*** (1.259)
size	0.197** (0.085)	-3.904** (1.737)	0.244*** (0.084)	-2.844* (1.724)	0.249*** (0.082)	-2.518 (1.679)	0.347*** (0.076)	-1.719 (1.520)
leverage	0.001 (0.008)	3.147*** (0.235)	0.002 (0.008)	3.104*** (0.237)	0.001 (0.008)	3.093*** (0.237)	0.004 (0.007)	3.250*** (0.228)
liquidity	-0.003 (0.039)	-0.118 (0.827)	-0.009 (0.039)	-0.484 (0.829)	-0.008 (0.039)	-0.452 (0.828)	-0.012 (0.038)	-0.396 (0.794)
growth	0.002 (0.001)	0.265*** (0.026)	0.002 (0.001)	0.256*** (0.026)	0.002 (0.001)	0.258*** (0.026)	0.001 (0.001)	0.267*** (0.024)
const	1.404*** (0.532)	-26.021** (10.710)	1.985*** (0.246)	14.054*** (5.139)	1.909*** (0.244)	11.885** (5.094)	1.191*** (0.495)	-31.074*** (9.886)
N	1,898	1,895	1,899	1,896	1,899	1,896	2,053	2,051
F	5.74***	45.44***	6.36***	57.29***	6.93***	57.96***	5.96***	69.31***
R (within)	0.03	0.17	0.02	0.15	0.02	0.16	0.02	0.17

*** p<0,01; **p<0,05; * p< 0,1

It is also very important to consider the separate impact on industrial companies, as they will have to undergo strong changes with the implementation of sustainable standards. These companies are responsible for significant carbon emissions, waste disposal, and resource consumption, which can have negative environmental impact. With the growing popularity of ESG among investors comes the need to consider the CSR approach in the development of companies' strategies and to implement sustainability-related initiatives more actively. Therefore, in order to check whether there is an effect of improved ESG scores on the financial performance of energy / metallurgy / materials companies, panel regression models were also built.

However, the models showed that a statistically significant impact on the finances of the industrials was not found (Table 11), the only effect comes from governance factor. In contrast to

the regression for all industries, the G factor has a significant effect for the industrials regression, while the other components have no such effect. And governance has an effect on both Tobin's Q and ROE - 1 percentage point would increase Tobin's Q by 0.16 units and ROE by 6.06 percentage points, which can also be explained by better and more transparent management and increased reliability in the market. It seems that environmental and social factors can be important considerations for industrial companies, but they may not have as direct impact on financial performance as governance factors, because it may take some time for their financial benefits to be realized.

Thus, the first hypothesis about the positive effect of the ESG on financial performance is confirmed. However, the third hypothesis of a stronger effect on industrial companies could not be confirmed. The constructed regression models were also tested for robustness by running the models without zero E,S,G scoring. The result remained the same - a significant effect of ESG scoring on the financial performance of companies (Appendix 1, Appendix 2).

Table 11. A regression model for all industrial companies (industrial, energy, materials sectors)

	FE model		FE model		FE model		FE model	
	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE
E score	0.018 (0.023)	0.198 (0.741)	0.040* (0.020)	0.930 (0.651)				
S score	0.034 (0.023)	0.996 (0.739)			0.046** (0.020)	1.283** (0.651)		
G score	0.164** (0.070)	6.061*** (2.029)					0.173** (0.071)	6.458*** (1.869)
size	-0.296*** (0.102)	-14.082*** (3.291)	-0.246** (0.101)	-12.207*** (3.250)	-0.265** (0.102)	-12.956*** (3.290)	-0.113 (0.098)	-12.573*** (2.845)
leverage	0.001 (0.009)	2.265*** (0.310)	0.001 (0.009)	2.167*** (0.312)	0.001 (0.009)	2.170*** (0.311)	0.001 (0.009)	2.451*** (0.292)
liquidity	0.203*** (0.051)	-1.135 (1.624)	0.192*** (0.051)	-1.562 (1.626)	0.183*** (0.051)	-1.775 (1.621)	0.199*** (0.050)	-1.217 (1.448)
growth	0.001 (0.001)	0.269*** (0.032)	0.001 (0.001)	0.265*** (0.033)	0.001 (0.001)	0.266*** (0.033)	0.001 (0.001)	0.255*** (0.030)
const	1.413** (0.571)	5.765 (16.905)	2.512*** (0.308)	46.027*** (9.945)	2.547*** (0.308)	47.014*** (9.928)	1.053* (0.568)	1.749 (15.253)
N	556	557	556	557	556	557	613	617
F	4.39***	20.98***	4.53***	26.61***	4.82***	27.09***	4.21***	33.96***
R (within)	0.07	0.25	0.05	0.23	0.05	0.23	0.04	0.26

*** p<0,01; **p<0,05; * p< 0,1

DISCUSSION

Today the problem of climate change is most acute. Climate change is happening much faster than expected, and it has already begun to affect people's lives in the form of droughts, floods, wildfires and other catastrophic events. These effects can have serious social, economic and environmental consequences, which will increase over time. Therefore, ESG is becoming a topic of public discourse, requiring governments and companies to take action to combat climate change and reduce greenhouse gas emissions.

However, many companies are still reluctant to use ESG in business processes. There are several reasons for this, for example, companies may not see ESG as a top priority for their business, especially if they do not have clear obligations from regulative authorities. Also, many companies may believe that implementing ESG principles may entail significant costs, and there are insufficient guarantees that they will pay off. In addition, it may be more important for companies to be profitable here and now to meet the demands of their shareholders. However, there is increasing evidence that companies that comply with the principles of the environmental agenda will have a tangible positive economic effect, or the opposite effect if they ignore this transformation.

The issue of strong impact is not even so much in terms of reputational risks or possible future profitability of the transition to low-carbon production, the issue is even more in terms of regulatory pressure. Firstly, companies that do not follow the ESG will increasingly suffer from regulatory pressure due to legislation, fines, activity restrictions and other measures that governments and regulators will take to maintain socially responsible business. Also, the opportunity cost of "not transitioning" to a low-carbon economy may become even higher than if the company had anticipated the transition in its business model. They will increasingly face higher payments for emissions, allowances and taxes on excess greenhouse gas exhaust. Secondly, failure to comply with ESG standards can lead to difficulties in accessing capital for companies that do not pay proper attention to social responsibility, environmental sustainability and corporate governance. For example, credit rating agencies explicitly integrate ESG considerations into their ratings of fixed income instruments, referring to the growing risk of energy transition due to climate change and carbon emissions. Businesses seeking to finance oil and gas purchases with rated public debt may face similar challenges in any rating assessment and therefore higher borrowing costs. Conversely, integrating ESG has led to significantly more favorable borrowing conditions for green and sustainability-related bonds. And of course, there is the great influence of reputational risks, the decline of investment attractiveness and a mass of other factors.

For most companies in the extractive industries and others, adherence to ESG principles will result in a dramatic redesign of the business. But it is already worth thinking about the risks that the near future may bring and starting to take action. To begin with, it should be realized that there is indeed a positive financial effect from ESG transformation, as this study confirms. Next, the company board should send a clear message to the entire company that going "green" is not just a tick-box exercise, but a new reality in strategic development. It is also necessary to assess the scale of the problem - to calculate carbon footprint: both from own production and indirect and evaluate the implementation of energy-efficient ways of production. It is important to set long-term goals, prescribe steps to achieve them in the work plans of each department, stop greenwashing. After all, in order to win place in the economy of the future, it is important to move from discussions and declarations to specific measures and actions.

CONCLUSION

The main goal of this study, as noted earlier, was to examine the relationship between ESG and financial performance for the period 2015-2021. The study found a correlation between ESG and the financials of companies. The empirical results confirmed the effect of ESG on S&P500 index companies, as evidenced by significant regression analysis estimates. Thus, increasing E and S scores respectively increases Tobin's Q and ROE, indicating improved market and operating efficiency, while increasing G score positively affects ROE only. The paper also examined the effect of ESG on the industrial sector separately and found a significant effect only on the G-score side.

Initial difference-in-means analysis revealed no better financial performance of companies with ESG scoring higher than median. Moreover, it was found that companies with higher ESG scores may be currently undervalued in the market. However, the t-test shows rough estimates, without taking into account the influence of other control factors and industry characteristics, so a regression analysis was conducted. As stated above, the results were the following: market performance is significantly influenced by environmental and social factors, while operational performance is positively influenced by all ESG components. At the same time, no impact on industrial companies from environmental or social factors was found, probably because these companies are still failing in significantly improvement of ESG standards, or the positive effect takes longer time horizon to be paid back.

The regression analysis performed allowed us to determine the degree of contribution of ESG factors to financial performance, as well as provide insight into the positive direction of influence, being the first step in the follow-up mechanism of decision-making. Based on this knowledge, companies can conduct ESG transformation faster and implement more sustainability initiatives. Thus, examining the relationship between ESG factors and the company's financial performance can be beneficial to its business in several ways, including identifying priority areas for action, gaining market advantage and managing ESG-related risks. This study makes a significant contribution to the current understanding of ESG, eliminating the confusion and controversy of the current debate. By shedding light on this important topic, this study can inspire business practitioners to be more receptive to introducing innovative changes to their business models and to be more proactive in implementing sustainability initiatives. In addition, the results of the study show that companies adopting ESG practices can strengthen their stakeholder relationships and increase public trust, which can help them meet the challenges of today's global economy and political landscape.

LITERATURE

1. Abdul Aziz, N. S., & Hj Bidin, R. (2017). A review on the indicators disclosed in sustainability reporting of public listed companies in Malaysia. *Journal of Human Capital Development*, 10(2), 1-14.
2. Abigail Yu (2022). The Global State of Mandatory ESG Disclosures. Available at: <https://www.azeusconvene.com/esg/articles/the-global-state-of-mandatory-esg-disclosures>
3. Ademi, Bejtush, and Nora Johanne Klungseth (2022). Does it pay to deliver superior ESG performance? Evidence from US S&P 500 companies. *Journal of Global Responsibility* 13: 421–49.
4. Alareeni, B., and Hamdan, A. (2020), ‘ESG impact on performance of US S&P 500-listed firms’, *Corporate Governance*, vol. 20, no. 7, pp. 1409-1428.
5. Ameer, R., & Othman, R. (2012). Sustainability practices and corporate financial performance: A study based on the top global corporations. *Journal of Business Ethics*, 108(1), 61-79.
6. Anton Lisin, Andrei Kushnir, Alexey G. Koryakov, Natalia Fomenko, Tatyana Shchukina (2021). Financial Stability in Companies with High ESG Scores: Evidence from North America Using the Ohlson O-Score. *Sustainability*, 14, 479
7. Arabella Advisors. (2018). The Global Fossil Fuel Divestment and Clean Energy Investment Movement [Online]. Available at: <https://www.arabellaadvisors.com> (Accessed 20 March 2021).
8. B.A. Alareeni, A. Hamdan (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance*, 20 (7), pp. 1409-1428
9. Bain&Company (2023). Do ESG Efforts Create Value? Available at: <https://www.bain.com/insights/do-esg-efforts-create-value/>
10. Bauer, R., Eichholtz, P. and Kok, N. (2010), “Corporate governance and performance: the REIT effect”, *real estate economics*”, *Real Estate Economics*, Vol. 38 No. 1, pp. 1-29
11. Berg, F.; Kölbel, J.F.; Rigobon, R. (2019) Aggregate Confusion: The Divergence of ESG Ratings. *SSRN Electron. J.*
12. Bhagat, S. and Bolton, B. (2009), “Corporate governance and firm performance: recent evidence”. *Electronic Copy*, Vol. 1361815, pp. 1-57
13. Bianchi, E.; Bruno, J.M.; Sarabia-Sanchez, F.J. (2019). The impact of perceived CSR on corporate reputation and purchase intention. *European Journal of Management and Business Economics.*, 28, 206–221.
14. BlackRock (2023). Sustainable Investing at BlackRock. Available at: <https://www.blackrock.com/ch/individual/en/themes/sustainable-investing>

15. Bloomberg (2023). Rising Credit Risks Pose Huge Challenge for the Worst Polluters. Available at: <https://www.bloomberg.com/news/articles/2022-11-30/rising-credit-risks-pose-huge-challenge-for-the-worst-polluters>
16. Bloomberg (2023). Environmental, Social & Governance (ESG) Bloomberg Professional Solutions. Available at: https://www.bloomberg.com/professional/solution/sustainable-finance/?gclid=CjwKCAjwyIKJBhBPEiwAu7zllzmCy3XB5bIzQOmPezKUD-8R75kRjy4RS-CPP7UqMec6fG1K9TUs2BoCBjcQAvD_BwE#scores/?utm_medium=Adwords&utm_campaign=ESG&utm_source=pdsrch&utm_content=esgscores&tactic=342352
17. Bragdon, J. H., & Marlin, J. A. T. (1972). Is Pollution Profitable? *Risk Management*, 19, 9-18.
18. Brammer, S., Brooks, C. and Pavelin, S. (2006) Corporate social performance and stock returns: UK evidence from disaggregate measures. *Financial Management*, 35 (3). pp. 97- 116.
19. Brunk, K.H. (2010) Exploring origins of ethical company/brand perceptions—A consumer perspective of corporate ethics. *J. Bus. Res.*, 63, 255–262.
20. Caesaria, A. F., & Basuki, B. (2017). The study of sustainability report disclosure aspects and the impact on the companies' performance. Paper presented at the SHS Web of Conferences.
21. Capital Monitor (2022). Link between ESG and profitability exists: New research. Available at: https://capitalmonitor.ai/sector/tech/link-between-esg-investment-exists-new-research/?hsamp_network=linkedin&hsamp=bJcmFQTjXiAZ
22. Charles H. Cho, Dennis Patten, R.W. Roberts (2014). Environmental disclosures and impression management. *Communication and Language Analysis in the Corporate World*.
23. Chartered Accountants of Canada (2010). Environmental, Social and Governance (ESG) issues in Institutional Investor Decision Making. Ontario, Canada, Chartered Accountants of Canada.
24. Chiong, P.T.N. (2010). Examination of Corporate Sustainability Disclosure Level and Its Impact on Financial Performance. University of Multimedia
25. Climate Bonds Initiative (2022). Green and other Labelled Bonds Held Market Share in 2022 Amidst Fall of Global Fixed-Income. Available at: <https://www.climatebonds.net/resources/press-releases/2023/01/green-and-other-labelled-bonds-held-market-share-2022-amidst-fall#:~:text=Green%20bond%20issuance%20made%20up,4bn%2C%20social%20bonds%20totalled%20USD130.>
26. Climate Bonds Initiative (2022). Sustainable Debt Tops \$1 Trillion in Record Breaking 2021, with Green Growth at 75%: New Report. Available at: <https://www.climatebonds.net/2022/04/sustainable-debt-tops-1-trillion-record-breaking-2021-green-growth-75-new->

38. Dhaliwal, D., Li, O. Z., Tsang, A., and Yang, Y. G. (2014), 'Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency', *Journal of Accounting and Public Policy*, vol. 33, no. 4, pp. 328-355.
39. Dimitris Melas, Zoltán Nagy and Padmakar Kulkarni (2016). MSCI. Research Insight.
40. Duncan Lamont (2021). Why companies with stronger ESG credentials should be expected to underperform...but won't. Available at: <https://www.schroders.com/en-us/us/individual/insights/why-companies-with-stronger-esg-credentials-should-be-expected-to-underperformbut-wont/>
41. Eklof, J., Podkorytova, O., & Malova, A. (2018). Linking customer satisfaction with financial performance: an empirical study of Scandinavian banks. *Total Quality Management & Business Excellence*, 1–19
42. Eliwa, Y., Aboud, A., and Saleh, S. (2019), 'ESG practices and the cost of debt: Evidence from EU countries', *Critical Perspectives on Accounting*.
43. Ellen Pei-yi Yu, Bac Van Luu, Catherine Huirong Chenc (2020). Greenwashing in environmental, social and governance disclosures. *Research in International Business and Finance*. Volume 52.
44. Elsayed, K. and Paton, D. (2005), "The impact of environmental performance on firm performance: static and dynamic panel data evidence", *Structural Change and Economic Dynamics*, Vol. 16 No. 3, pp. 395-412.
45. ESG Today (2023). Nestlé Enhances Supply Chain Sustainability Efforts with Forest Positive Strategy. Available at: <https://www.esgtoday.com/nestle-enhances-supply-chain-sustainability-efforts-with-forest-positive-strategy/>
46. ESG Today (2023). Microsoft Signs its First Ocean-Based Carbon Removal Agreement. Available at: <https://www.esgtoday.com/microsoft-signs-its-first-ocean-based-carbon-removal-agreement/>
47. Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of Director Diversity and Firm Financial Performance. *Corporate Governance*, 11(2), 102–111.
48. European Commission (2022). Carbon Border Adjustment Mechanism. Available at: https://taxation-customs.ec.europa.eu/green-taxation-0/carbon-border-adjustment-mechanism_en
49. European Parliament (2023). Corporate sustainability: firms to tackle impact on human rights and environment. Available at: <https://www.europarl.europa.eu/news/en/press-room/20230424IPR82008/corporate-sustainability-firms-to-tackle-impact-on-human-rights-and-environment>

50. Fatma, M.; Rahman, Z.; Khan, I. (2015). Building company reputation and brand equity through CSR: The mediating role of trust. *International Journal of Bank Marketing*, 33, 840–856.
51. Fisher-Vanden, K. and Thorburn, K.S. (2011). “Voluntary corporate environmental initiatives and shareholder wealth”, *Journal of Environmental Economics and Management*, Vol.62 No.3, pp. 430-445
52. Han, J.J., Kim, H.J. and Yu, J. (2016), “Empirical study on relationship between corporate social responsibility and financial performance in Korea”, *Asian Journal of Sustainability and Social Responsibility*, Vol. 1 No. 1, pp. 1-16
53. Haris RAMIĆ (2019). Relationship between ESG performance and financial performance of companies: an overview of the issue. Academic Thesis.
54. He, Y.; Lai, K.K. (2014). The effect of corporate social responsibility on brand loyalty: The mediating role of brand image. *Total Quality Management & Business Excellence*, 25, 249–263.
55. Hermalin, B. E., & Weisbach, M. S. (1991). The Effects of Board Composition and Direct Incentives on Firm Performance. *Financial Management*, 20(4), 101–112.
56. Hussein, A. and Kamardin, A.-R.H. (2016). “Corporate governance: the international journal of business in society article information”, *The International Journal of Business in Society*, Vol. 16 No. 2, pp. 1-40.
57. IFRS (2023). Connectivity in practice: the IASB’s new project on Climate-related Risks in the Financial Statements. Available at: <https://www.ifrs.org/news-and-events/news/2023/03/connectivity-in-practice-the-iasbs-new-project-on-climate-related-risks-in-the-financial-statements/>
58. Kenan Insight (2022). Does ESG Investing Generate Higher Returns? [Online]. Available at: <https://kenaninstitute.unc.edu/kenan-insight/does-esg-investing-generate-higher-returns/>
59. Krosinsky C., Robins N. (Eds.) (2012). Sustainable investing: The art of long-term performance. Routledge, pp. 189–200.
60. Lawrence E. Mitchell (2002). The Sarbanes-Oxley Act and the Reinvention of Corporate Governance. *Villanova Law Review*
61. Lev, B., Petrovits, C. and Radhakrishnan, S. (2010). “Is doing good good for you? How corporate charitable contributions enhance revenue growth”, *Strategic Management Journal*, Vol.31, No.2, p. 182-200
62. Liam Jones (2022). “\$500bn Green Issuance 2021: social and sustainable acceleration: Annual green \$1tn in sight: Market expansion forecasts for 2022 and 2025” [Online]. Available at:

- <https://www.climatebonds.net/2022/01/500bn-green-issuance-2021-social-and-sustainable-acceleration-annual-green-1tn-sight-market>
63. Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *The Journal of Finance*, 72(4), 1785-1824.
 64. López, M. V., Garcia, A., & Rodriguez, L. (2007). Sustainable development and corporate performance: A study based on the Dow Jones sustainability index. *Journal of Business Ethics*, 75(3), 285-300.
 65. Martínez R. (2022). Partnering with customers in search of lost trust in the new risk environment. A guide for consumer products and services companies. Deloitte. URL: <https://www2.deloitte.com/global/en/blog/responsible-business-blog/2022/partnering-with-customers-in-search-of-lost-trust-in-the-new-risk-environment.html>
 66. Max M. Schanzenbach, Robert H. Sitkoff (2020). ESG Investing: Theory, Evidence, and Fiduciary Principles. *Journal of Financial Planning*
 67. McKinsey Global Institute (2021). The consumer demand recovery and lasting effects of COVID-19. Available at: <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/the-consumer-demand-recovery-and-lasting-effects-of-covid-19>
 68. McKinsey Digital (2023). ESG data governance: A growing imperative for banks. Available at: <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/tech-forward/esg-data-governance-a-growing-imperative-for-banks>
 69. McWilliams, A. and Siegel, D. (2000), "Corporate social responsibility and financial performance: correlation or misspecification?", *Strategic Management Journal*, Vol. 21 No.5, pp. 603-609
 70. Merza Radhi, D.S. and Sarea, A. (2019). "Evaluating financial performance of Saudi listed firms: using statistical failure prediction models", *International Journal of Business Ethics and Governance*, Vol.2 No. 1, pp. 1-18
 71. Michael Guilfoyle (2022). Energy Transition and Industrial Sustainability. Available at: <https://www.arcweb.com/industry-best-practices/energy-transition-industrial-sustainability>
 72. Morgan Stanley (2019). "Institute for Sustainable Investing. Sustainable Reality. Analyzing Risk and Returns of Sustainable Funds." Executive Summary
 73. MorningStar (2021). ESG and Access to Capital. Available at: <https://www.morningstar.in/posts/65105/esg-access-capital.aspx>
 74. Moskowitz, M. R. (1972). Choosing Socially Responsible Stocks. *Business and Society Review*, 1, 71–75.

75. MSCI World ESG Leaders Index (USD) (2023). Available at: <https://www.msci.com/documents/10199/db88cb95-3bf3-424c-b776-bfdcca67d460>
76. Muhammad Atif, Benjamin Liu, Sivathaasan Nadarajah (2022). The effect of corporate environmental, social and governance disclosure on cash holdings: Life-cycle perspective. *Business Strategy and the Environment*. Volume 31, Issue 5
77. Murray, A., Sinclair, C.D., Power, D. and Gray, R. (2006). Do financial markets care about social and environmental disclosure? Further evidence and exploration from the UK. *Accounting, Auditing & Accountability Journal*, Vol. 19 No. 2, pp. 228-255.
78. Nazarova V. (2022). Do ESG factors influence investment attractiveness of the public companies? *Journal of Corporate Finance Research*, 16 (1) (2022), pp. 38-64
79. Nguyen, D. T.; Hoang, T. G.; and Tran, H. G., Help or Hurt?., (2022) The Impact of ESG on Firm Performance in S&P 500 Non-Financial Firms, *Australasian Accounting, Business and Finance Journal*, 16(2), 91-102
80. Nollet, J., Filis, G. and Mitrokostas, E. (2016). “Corporate social responsibility and financial performance: a non-linear and disaggregated approach”, *Economic Modelling*, Vol. 52, pp. 400-407
81. Ogundare, E. A. (2013). The impact of sustainability reporting on organisational performance- The Malaysian experience. *International Journal of Accounting & Business Management*, 1(2), 82-100.
82. Olaf Stotz (2021). “Expected and realized returns on stocks with high- and low-ESG exposure”. *Journal of Asset Management*. Volume 22, pages 133–150
83. Paris Agreement (2015). Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf
84. Patten, D.M. (1991), “Exposure, legitimacy, and social disclosure”, *Journal of Accounting and Public Policy*, Vol. 10 No. 4, pp. 297-308
85. Porter, M. E., & Linde, C. V. D. (1995). Toward a New Conception of the Environment Competitiveness Relationship. *Journal of Economic Perspectives*, 9(4), 97–118
86. PwC (2023). ESG-Рейтинги и как они работают. Available at: <https://www.pwc.com/kz/ru/esg-rating.html#:~:text=ESG%2D%D1%80%D0%B5%D0%B9%D1%82%D0%B8%D0%BD%D0%B3%20E2%80%93%20%D1%8D%D1%82%D0%BE%20%D0%BE%D1%86%D0%B5%D0%BD%D0%BA%D0%B0%20ESG,%D0%BD%D0%B5%D1%81%D0%BA%D0%BE%D0%BB%D1%8C%D0%BA%D0%B8%D1%85%20%D0%B4%D0%B5%D1%81%D1%8F%D1%82%D0%BA%D0%BE%D0%B2%20%D0%B4%D0%BE%20%D0%BD%D0>

%B5%D1%81%D0%BA%D0%BE%D0%BB%D1%8C%D0%BA%D0%B8%D1%85%20
%D1%81%D0%BE%D1%82%D0%B5%D0%BD.

87. Rahm Sophie (2013). “Assessing the financial component of sustainability strategies in the mining sector”. Schrodgers. Mining the ESG ground. Research paper
88. Ramesh, K.; Saha, R.; Goswami, S.; Dahiya, R. (2019). Consumer’s response to CSR activities: Mediating role of brand image and brand attitude. *Corporate Social Responsibility and Environmental Management.*, 26, 377–387.
89. Rebecca Campbell (2022). “Mining & metals 2022: ESG and energy transition – the sector’s biggest opportunity”. Available at: <https://www.whitecase.com/publications/insight/mining-metals-2022-esg-and-energy-transition-sectors-biggest-opportunity>
90. Reber, B., Gold, A. & Gold, S. (2021) ESG Disclosure and Idiosyncratic Risk in Initial Public Offerings. *J Bus Ethics*
91. Reuters (2022). Insurer Allianz toughens oil & gas policy to help meet climate goal. Available at: <https://www.reuters.com/business/energy/insurer-allianz-toughens-oil-gas-policy-help-meet-climate-goal-2022-04-29/>
92. Ross Kerber and Simon Jessop (2021). “Analysis: How 2021 became the year of ESG investing” [Online]. Available at: <https://www.reuters.com/markets/us/how-2021-became-year-esg-investing-2021-12-23/>
93. S&P Global Ratings. (2021). ESG in Credit Ratings [Online]. Available at: <https://www.spglobal.com/ratings/en/products-benefits/products/esg-in-credit-ratings>
94. San Ong, T., Teh, B.H. and Ang, Y.W. (2014). The impact of environmental improvements on the financial performance of leading companies listed in Bursa Malaysia. *International Journal of Trade, Economics and Finance*, Vol. 5 No. 5, p. 386.
95. ShareAction (2021). \$4.2tn investors call on leading banks to strengthen climate ambitions before COP26. Available at: <https://shareaction.org/news/investors-call-on-banks-to-strengthen-climate-ambitions-before-cop26>
96. Smith, M., Yahya, K. and Marzuki Amiruddin, A. (2007). Environmental disclosure and performance reporting in Malaysia. *Asian Review of Accounting*, Vol. 15 No. 2, p.185-199.
97. Surroca, J., Tribo, J.A. and Waddock, S. (2010). “Corporate responsibility and financial performance: the role of intangible resources”, *Strategic Management Journal*, Vol. 31 No. 5, pp. 463-490
98. The Paris Agreement (2016). Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

99. The sustainability disconnect between consumers & retail executives (2022). First Insight.
URL: <https://www.firstinsight.com/white-papers-posts/the-sustainability-disconnect-between-consumers-and-retail-executives>
100. Thorne, D., M., O. C. Ferrell, et al. (2011). *Business & Society: Strategic Approach to Social Responsibility and Ethics*. USA, South-Western Cenagage Learning.
101. UN environment programme (2019). *Principles for Responsible Banking*. Available at: <https://www.unepfi.org/banking/bankingprinciples/>
102. UniCredit (2023). UniCredit sets Net Zero targets for carbon intensive sectors. Available at: <https://www.unicreditgroup.eu/en/press-media/press-releases/2023/unicredit-fissa-gli-obiettivi-net-zero-per-i-settori-ad-alte-emi.html>
103. Van Duuren, E., Plantinga, A. & Scholtens, B. (2016). ESG Integration and the Investment Management Process: Fundamental Investing Reinvented. *J Bus Ethics* 138, 525–533.
104. Vanguard (2023). Vanguard’s approach to ESG investing. Available at: <https://www.nl.vanguard/professional/investment-capabilities/esg/our-approach-to-esg>
105. Verrecchia, R.E. (2001), “Essays on disclosure”, *Journal of Accounting and Economics*, Vol. 32, p. 97-180
106. Verrecchia, R.E. (2001). “Essays on disclosure”, *Journal of Accounting and Economics*, Vol. 32 Nos 1/3, pp. 97-180
107. Waddock, S.A., Graves, S.B. (2000), “Beyond built to last... stakeholder relations in ‘built to last’ companies”, *Business and Society Review*, Vol. 105 No. 4, pp. 393-418
108. Waddock, S.A.; Bodwell, C.; Graves, S.B. (2002). Responsibility: The new business imperative. *Academy of Management Perspectives*, 16, 132–148.
109. Walley, N., & Whitehead, B. (1994). It’s Not Easy Being Green. *Harvard Business Review*, 72, 46–52
110. Whetman, L. L. (2018). The impact of sustainability reporting on firm profitability. *Undergraduate Economic Review*, 14(1), 1-21.
111. Witold Henisz, Tim Koller, and Robin Nuttall (2019). Five ways that ESG creates value. *McKinsey Quaterly*
112. Wong, W. C., Batten, J. A., and Ahmad, H. (2020), ‘Does ESG certification add firm value?’, *Finance Research Letters*, pp. 1-18.
113. World Bank Group. (2017). *World Bank Group Announcements at One Planet Summit* [Online]. Available at: <https://www.worldbank.org/en/news/press-release/2017/12/12/> (Accessed 20 March 2021).

114. Wu, S.I.; Wang, W.H. (2014). Impact of CSR perception on brand image, brand attitude and buying willingness: A study of a global café. *International Journal of Marketing Studies*, 6, 43–56.
115. Yu, M., & Zhao, R. (2015). Sustainability and firm valuation: an international investigation. *International Journal of Accounting & Information Management*, 23(3), 289–307.

APPENDIX

Appendix 1. A regression model for all industries without 0 scores

	Fixed effect model (FE)		Fixed effect model (FE)		Fixed effect model (FE)		Fixed effect model (FE)	
	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE
E score	0.045*	1.305**	0.069***	1.854***				
	(0.024)	(0.548)	(0.022)	(0.516)				
S score	0.069***	1.038*			0.088***	1.764***		
	(0.025)	(0.574)			(0.024)	(0.538)		
G score	0.057	6.192***					0.071	6.674***
	(0.071)	(1.622)					(0.066)	(1.480)
size	0.080	-12.260**	0.123	-11.194***	0.134	-10.244***	0.242	-9.816***
	(0.096)	(2.147)	(0.095)	(2.140)	(0.092)	(2.078)	(0.085)	(1.871)
leverage	0.006	2.839***	0.006	2.802***	0.006	2.783***	0.008	2.966***
	(0.008)	(0.279)	(0.008)	(0.280)	(0.008)	(0.281)	(0.007)	(0.265)
liquidity	0.028	-0.384	0.024	-0.782	0.021	-0.846	0.019	-0.788
	(0.042)	(0.976)	(0.042)	(0.977)	(0.042)	(0.978)	(0.040)	(0.922)
growth	0.002	0.289***	0.001	0.282***	0.002	0.285***	0.002	0.295***
	(0.001)	(0.028)	(0.001)	(0.028)	(0.002)	(0.028)	(0.001)	(0.026)
const	1.568***	-2.291	1.983***	40.850***	1.918***	38.925**	1.330**	-6.090
	(0.564)	(13.058)	(0.298)	(6.817)	(0.297)	(6.810)	(0.521)	(11.848)
N	1,545	1,544	1,546	1,545	1,546	1,545	1,700	1,700
F	3.70***	35.73***	3.46***	45.53***	4.31***	45.01***	2.64**	57.59***
R (within)	0.02	0.17	0.01	0.16	0.02	0.16	0.01	0.18

*** p<0,01; **p<0,05; * p< 0,1

Appendix 2. A regression model for industrial sector without 0 scores

	FE model		FE model		FE model		FE model	
	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE	Tobin's Q	ROE
E score	0.028	0.312	0.036**	0.983				
	(0.018)	(0.824)	(0.016)	(0.729)				
S score	0.012	0.923			0.026*	1.209*		
	(0.017)	(0.796)			(0.015)	(0.707)		
G score	0.054	5.789**					0.082	6.137***
	(0.056)	(2.530)					(0.062)	(2.278)
size	-0.517***	-14.687***	-0.504***	-13.497***	-0.504***	-14.049***	-0.294***	-13.541***
	(0.081)	(3.737)	(0.080)	(3.712)	(0.081)	(3.743)	(0.086)	(3.205)
leverage	0.005	1.779***	0.005	1.763***	0.004	1.762***	0.004	2.066***
	(0.007)	(0.380)	(0.007)	(0.383)	(0.007)	(0.382)	(0.008)	(0.352)
liquidity	0.085**	-1.700	0.080**	-2.343	0.072*	-2.550	0.107**	-1.817
	(0.041)	(1.861)	(0.040)	(1.842)	(0.040)	(1.833)	(0.044)	(1.619)

growth	0.001 (0.001)	0.272*** (0.034)	0.001 (0.001)	0.266*** (0.034)	0.001 (0.001)	0.267*** (0.034)	0.001 (0.001)	0.256*** (0.031)
const	2.989*** (0.472)	13.042 (21.543)	3.364*** (0.263)	53.516*** (12.215)	3.404*** (0.263)	54.445*** (12.151)	2.273*** (0.513)	10.079 (18.856)
N	509	509	509	509	509	509	566	569
F	7.24***	15.34***	9.85***	19.89***	9.35***	20.16***	3.99***	25.17***
R (within)	0.11	0.21	0.11	0.20	0.11	0.20	0.04	0.21

*** p<0,01; **p<0,05; * p< 0,1