DEPARTMENT OF ACCOUNTING AND FINANCE

What is the effect of ESG on firm's performance?

UK FTSE All-Share Index Evidence

MASTER THESIS

NIKOL INKOVA

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ΒΕΒΑΙΩΣΗ

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Η εξεταστική επιτροπή,

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Abstract

The purpose of this study is to identify whether investing in ESG practices is beneficial for a firm's financial and market performance. The current paper will answer the questions: "Do environmentally friendly companies have better firm performance?" and "Do firms with higher ESG score and better corporate governance mechanisms, lead to better firm performance?". Moreover, the study will implement the ideas developed in the agency and stakeholder theory. The dataset includes 2196 UK FTSE All-Share Index observations for the period 2009-2020. The companies are drawn from manufacturing, retail, and services industries. The data has been collected from Refinitiv and Thomson Reuters Asset4 Datastream. Three proxies have been used for representing a firm's performance - ROA, MVBV and annual stock returns. As the expected relations on this topic are contradictory, the hypothesis used for this paper is in a non-directional form stating that ESG is associated with future firm performance. A negative significant relationship has been found between ESG and ROA which can be due to the increase of the additional environmental cost implemented which will decrease firm profitability. A negative significant relationship has been discovered between ESG score and MVBV and annual stock returns, explaining that investors are not so focused on ESG practices rather than pure profits as stated by the traditional economic theory. The results can be used to optimise management activities on the board of directors. The current study contributes to the overall literature by investigating the association between ESG score and firm performance of the UK FTSE All-Share Index corporations. Moreover, the paper compensates for the gap between the UK's ESG and firm performance association analysis and thus, confirms the importance of ESG practices in today's days. The conclusions of this study have placed a foundation for further and more in-depth examination in the future. Future research could consider a multi-national sample, focusing on a broader group of environmental attributes.

Contents

Chapter one

Introduction

1. Introduction

In recent years, there was a significant increase in the attention of various stakeholders on the firm's Environmental, Social and Governance (ESG) aspects. ESG refers to a comprehensive variety of ESG factors that might have an effect on firm's capability to create value. "It refers to the incorporation of non-financial elements into business strategy and decision-making in a corporate context" (Koundouri et. al, 2022). Even though ESG is related to the incorporation of non-financial elements, there might be financial consequences due to its association with corporate profitability and prosperity. The increased recognition of ESG importance in creating value for both entities and society, has directed corporations to increase their efforts when it comes to intergrating ESG practices and delivering the needed extra ESG data required by the ESG responsible investors. Thus, an important element that should be incorporated into the list of board of directors' values is the so-called "green governance" (Post et al., 2011). An increasing amount of the academic literature in this field indicated that boards should be implemented in such a way to be more focused on ESG concerns (Mahmood & Orazalin, 2017). By showing their growing devotion towards sustainable issues, organizations expect to create more value and improve their performance if not in short, in the long term. Subsequently, an important question comes into mind – *Do environmentally friendly entities gain financial benefits?*

Among practitioners and academics, there is an increasing consensus that ESG can have a substantial impact over firm's performance. People have realised that "ESG has become an important source of the corporate risk and may affect the company's financial performance and profitability" (Zhao et al., 2018). Zhao et al. (2018) have investigated the association between ESG performance and financial indicators. They have found that "good ESG performance can improve financial performance" (Zhao et al., 2018). They examined this realationship in terms of China's listed power generation firms and have constructed an ESG

evaluation index system. Thus, the results cannot be interpreted in the terms of other countries. The question as to "what is the effect of ESG on financial performance in the UK" has not been comprehensively examined and studied. The need for ESG research in the UK is vital at present and it can help investors, industry officials and firm managers. "Sustainable development is one of the key global trends in the development of modern companies" (Egorova et al., 2021). Rodriguez-Fernandez (2016) tested the relationship between CSR and financial performance and found that "social is profitable and the profitable is social". The author has used a social behavioural index formed by four different components which differes from the approach of this current study. This paper contributes to the literature by analyzing the association between ESG and firm's financial and market performance in the UK. Topic which have been generating a significant amount of coverage and discussion. The study incorporates the concepts of two theories – agency and stakeholder theory. As Dey (2008) discovered "the existence and role of various governance mechanisms in a firm are a function of the level of agency conflict". Hence, having better CG mechanisms (including better board composition) may reduce agency problems and increase firm's performance. Management bodies would be continuously tempted to deviate from their fiduciary duty towards shareholders, namely maximasing their wealth. However, the concept of agency theory gives the suggestion and implementation of diverse governenance mechanisms which can help reduce this issue. "The reinforcement of the role of the board of directors and the tightening of audit and control mechanisms came to serve this purpose" (Safieddine, 2009). By implementing better corporate governance practices, corporations will enhance their overall performance. Regarding, ESG and firm performance, this paper incorporates the idea behind the stakeholder theory which explains that by satisfying the interests not only to the shareholders but other stakeholders too – this can lead to a better reputation and customer loyalty. Corporations should consider that not only the interests of shareholders are the ones that matter. It is important for other stakeholders views to be considered as well. Satisfied stakeholders such as the society can bring many benefits to a corportaiton. In such cases when the company does not act socially responsible, this can result in increse in costs and lead to a financial burden likely to reduce profits (Rodriguez-Fernandez, 2016). On the other hand, some investors might be focused more on the traditional economic theory and care only about profits leading to negative association. Followed by the above discussion this paper is

going to answer the following research questions – *Do companies with higher ESG score lead to better financial and market performance?* and *Do companies with higher ESG score and better corporate governance mechanisms, lead to better financial and market performance?*

To date, the relationship between ESG score and firm's performance has been unclear due to the incomplete and various results. The question of how and if financial and market performance have been affected by ESG is still in debate among academics (Chau et al., 2014). Some authors have found a positive association (Reverte et al., 2016) while others concluded that there is nagative (Brammer et al., 2006) or no significant relationship (Barnett & Salomon, 2012). Barnett & Salomon (2012) hypothesized that the CSP-CFP relationship is U-shaped. Their results showed that entities with low CSP have higher CFP but firms with high CSP have the highest CFP. However, they state that "In order for some firms to increase their capacity to benefit from investments in social responsibility, they might have to endure a period of decreased financial performance" (Barnett & Salomon, 2012). This has been expected by the current study by stating that better ESG score leads to worse financial performance in terms of ROA. Barnett & Salomon (2012) focused their study more on the social pefrormance rather than on all the three aspects of ESG. The current paper will overcome this by implementing the Asset4 ESG score. In their study, Uyar et al. (2020) tested whether CSR performance improves an organisation's financial performance. The authors implemented their study only for the hospitality and tourism industry. Their results indicated that the tested relationship "did not produce a significant outcome" (Uyar et al., 2020). However, the study includes only entities from the hospitality and tourism industry and their results may not be applicable to other sectors. Moreover, their research is based on multi-national data which may bring nonequivalence of key concepts and matching of samples. This study will try to overcome the abovementioned limitations by focusing only on one country and investigating entities from manufacturing, retail and services. The current paper contributes to the literature as it uses ESG score with regards to the UK companies not previosly investigated. This provides an important references for the Asset4 ESG score and the guidance of managers in the retail, manufacturing and services industry. Moreover, in most of the cases, studies has been based on one industry such as information techology, oil and gas etc. The conclusions of this study have placed a foundation for further and more in-depth examination in the future. The results

of this paper have generated very good understandings for developed economies, such as that of the UK. Last but not least, the paper compensates for the gap between the UK's ESG and firm's performance association analysis and thus, confirms to the importance of ESG practices in todays days.

The analysis in this study has been carried out using regression models. The data collected includes 2196 observations including companies listed on the UK FTSE All-Share Index for the period 2009 - 2020. The sample comprises of entities from three sectors, namely manufacturing, retail and services. The data excludes financial organizations. To make sure that the model estimates are the Best Linear Unbiased estimators (BLUE), some econometric analyses have been undertaken such as test for outliers, multicollinearity, heteroskedasticity and normality test. Some of the generated results deviated from the expectations of this study. Nevertheless, most importantly, the relationship between ESG score and firm's performance appeared negatively and statistically significant in terms of ROA (Models 1A and 1B), MVBV (Model 2A) and annual stock returns (Models 3A and 3B). Firstly, the results state that better ESG score will lead to worse financial performance (ROA). This is because companies will implement additional environmental costs which in turn will give lower profitability. However, considering firm's market performance, it can be seen that lower ESG score will lead to better MVBV and annual stock returns. An explanation to this might be due to the idea that investors are not focused on being environmentally friendly but only on their increase of profits. Put simply, they are concentrated on the traditional economic theory. Later on, it has been argued that the relationship between ESG score and firm performance can be both either negative or positive leading to the creation of Hypothesis 1. Positive relationship between ESG and market performance can be expected when investors are more concerned about the environmental impact of the entity rather than focusing on pure profits. This can be due to the idea that even though this will not bring benefits in the short-term, it will benefit in the longer term. However, followed by the empirical results, Hypothesis 1 will be accepted showing that indeed a relationship exists between ESG and future firm performance.

The remainder of this study continues as follows. Chapter 2 discusses the theoretical and institutional framework. Additionally, the main hypothesis has been discussed. Chapter 3

introduces some background and related empirical studies. Chapter 4 represents the data, methodology and econometric analysis. Chapter 5 evaluates the empirical results and a detailed analysis of the data and comparison with the findings of previous papers. Finally, Chapter 6 concludes the paper and explains the main limitations and directions for future research.

Chapter two

Theoretical and institutional framework

2. Theoretical and institutional framework

2.1. ESG and firm's performance

Nowadays, ESG performs an important role in advocating stakeholders' interests and influencing organisations profitability. The question that many entities are trying to answer is *"In what way is our performance being impacted if we invest in ESG practices?"*. There are a couple of existing theoretical frameworks which can find an answer to this question. Firstly, the concept behind the neoclassical theory describes that there are some industries that may face higher costs related to the implementation of ESG practices and thus, experience a competitive disadvantage or in other words, a decrease in their financial performance (Wagner et al., 2002). For example, this can be considered to be true in the case of manufacturing organisations. The reason is that the cost of reducing their emissions can be relatively high which will cause growth in the production marginal cost. Several other sectors exist which contribute to a considerable amount of Greenhouse gas (GHG) emissions which makes them more vulnerable to the ESG metrics. These can be oil & gas, metals & mining, and power generation. It can be argued that these industries might be under higher exogenous and endogenous pressures regarding implementing ESG practices due to the high ESG risks they face. Stricter environmental regulations might be even imposed on such corporations. Matakanye et al. (2021) investigated whether firms in diverse industries respond differently stakeholders' pressures when prioritising ESG activities. However, they found that "the type of industry does not have a significant role in determining the ESG rating of a company" (Matakanye et al., 2021).

Agency theory claims that the implementation of ESG practices contradicts the main purpose of entities which is to maximise shareholder value. Put simply, it states that ESG will lead to a reduction in shareholders' gratification. However, these positions have been increasingly challenged by various academics who have argued that the implementation of

ESG practices leads to better corporate financial performance (Whelan et. al, 2021). This concept can be endorsed by the stakeholder theory (Alhumaymidi, 2021). Stakeholder theory "explains the relationship between stakeholders and the information they receive" (Sun et al., 2010). The theory was introduced by Freeman and it defines that management should operate in a much more complicated environment than just following the perception of maximising shareholder value. The main emphasis of this theory is based on the question of how companies manage their stakeholders, which can be characterized as "any group or individual who can affect or is affected by the achievement of an organisation's objectives" (Freeman, 1983). By way of explanation, stakeholders group may include shareholders, business associations, customers, government authorities, suppliers. To avoid conflict of interests, corporate managers should take into account the interests of stakeholders. The theory concentrates on the "agreements" between stakeholders and managers. Furthermore, some of the most important qualities that should be at its core are trust and cooperation. These are the attributes of a company that can bring a competitive advantage (Jones, 1995). Fulfilling stakeholders demands by implementing ESG practices, entities may improve their overall reputation and increase the loyalty of customers. That way, better performance can be accomplished. As Balatbat et al. (2012) stated "it is suggested that the satisfaction of multiple stakeholder interests in a company is imperative in order to ensure good company performance, and that a non-conflicting interest across all stakeholders is a genuine concern for ethical or responsible practices". Put simply, it is expected by corporations to incorporate ESG practices into their daily business activities. Moreover, stakeholder theory claims that by focusing on broader group of stakeholders, this will assert entity's overall success and further stability and growth (Qureshi et al., 2021). This paper will contribute to the literature by investigating the relationship between ESG and firm's performance, looking through the lenses of the stakeholder theory.

However, a question that comes into mind is which industries will be mostly affected by the ESG? This paper studies the ways in which common managers consider the environmental, social, and governance factors in their process of investment. The ESG is significant for the retail business as sustainability and ESG initiatives are growing and becoming key to the strategies of meeting changing conditions. Similarly, ESG is becoming

crucial for the fashion and beauty industries and calls for new management approaches. However, sustainability is becoming more and more attractive to customers, therefore, by investing in sustainable solutions, retail owners manage to have a better market position. Additionally, they strive for boosting foot traffic by building an environment that focuses on the experience. Nowadays, sustainability is becoming a key element and in manufacturing, which is the process of transforming raw resources into complete goods and services. It has developed a long-lasting value for not only shareholders, but all stakeholders. In order to grow the future of sustainability, factories are introducing smart capabilities and the ESG building blocks are adhering more and more with the businesses of today. For the manufacturing industry the three dimensions of ESG can be explained as follows: environmental is the manufacture of goods in line with efficient energy, material and resource usage as well as reduced negative climate impact, social is about the relationship with employees, human rights, safety, health, diversity and governance is about ethics, good corporate governance, data protection, product quality. The main sustainability copetitive advantage in this industry is the low environmental impact, meaning less waste, less energy consumption, less negative overall environmental impact (Buallay et al., 2019). In their study, Buallay et al. (2019) found that "sustainability report disclosure positively affects the manufacturing sector's performance".

Agency theory addresses the presence of important problem between principal (shareholders) and agent (managers) which is deemed to be unavoidable. On one hand, the responsibility of the agent is to maximise shareholders' wealth. On the other hand, agents also have their own interests – to maximise their individual wealth. Thus, agency problems arise when the interests of the agent contradict with those of the principal and when there is a separation of ownership and control (La Porta et al., 1999; Berger & di Patti, 2006). These problems may lead to a decrease in the firm performance and disturb the smooth running of organisations. Agency theory suggests that corporations can reduce agency problems and enhance corporate performance through implementing diverse governance mechanisms. Agency literature suggests that "outside directors on the board provide important monitoring functions in an attempt to resolve, or at least mitigate, agency conflicts between management and shareholders" (Bathala & Rao, 1995). Moreover, other studies commented that when the

role of the CEO and the Chairman is taken by the same individual, this gives an enourmous amount of power for the CEO which can hinder the effective control of the board (Donker et al., 2008). Thus, it can be argued that there are different mechanisms that may help reduce the agency conflict. These can be – having more independent directors on board, CEO and Chairman roles being played by different individuals, etc. Considering that these mechanisms have been implemented, this can also lead to better corporate financial and market performance.

Based on the topic of this study, it is believed that the two theories that fit the research mostly are stakeholder theory and agency theory. Thus, this paper will employ the concepts of these two theories and will look through their lenses when undertaking empirical research. However, future studies should investigate the above-mentioned theories in more debt connecting it closely to the ESG practices and board composition.

In general, the agency theory is focused mainly on the interest of shareholders. Thus, it is in contradiction with the stakeholder theory, which describes the composition of organizations as a collection of various individual groups with different interests, taken together, and further defended in the business decisions taken in the governance process. Many challenges within the business world arise as a result of incomplete information, miscommunication, and conflict between the interested parties, leading to impossility to reach an agreement and common decisions.

Therefore, although existing theories support a relation between ESG and future performance, the expected relations are contradictory. Thus, the hypothesis used for this study is in a non-directional form as follows:

➢ ***Hypothesis 1****: ESG is associated with future firm performance*

The future performance has been measured based on two different proxies. First by accounting profitability, ROA and second by market-based measures, namely MVBV and annual stock returns. Given that ESG is a recent concept there are not a lot of studies that link ESG to future firm performance. However, given that ESG also reflects another mechanism of corporate governance in the next section I have discussed papers that links

different corporate governance mechanisms to firm performance to provide more support for the study's main hypothesis as stated above.

2.2. Institutional framework for the United Kingdom

The study investigates the effect of ESG score on financial and market performance of firms in a common law country, namely the UK. The so-called common law is the England and Wales legal system which is derived from judicial precedent rather than statutes. Furthermore, in countries using common law, the court makes its judgement based on previous cases and thus, the judgement becomes "part of the national law" (Chouaibi et al., 2020). Followed by this, it can be expected that the results of this paper will differ for studies based on civil law countries (such as Germany).

Additionally, the UK is a developed country that choose to engage voluntary to respect the rules of human rights and good governance. Thus, no single main ESG legislation, nor regulation exists in the UK. Instead, the ESG practices have been structured based on EU-derived as well as domestic regulations and laws, main of which are not exclusively addressed to ESG. The major and most important legislative sources are as follows: the UK Corporate Governance Code 2018, the Listing Rules, the Disclosure Guidance and Transparency Rules, the directors' duties set out in the Companies Act 2006, the Bribery Act 2010, the UK Stewardship Code 2020, the Corporate Manslaughter and Corporate Homicide Act 2007, the Large and Medium-sized Companies and Groups (Accounts and Reports) Regulations 2008, the Equality Act 2019, and last but not least, the Modern Slavery Act 2015. However, the main ESG disclosure regulations are the Companies Act, the UK Corporate Governance Code 2018 and the Disclosure Guidance and Transparency Rules (Rose & Richardson, 2021). However, even though the UK have chosen to voluntary respect environmental issues and human rights, during 2013, a mandatory Regulation has been implemented, requiring all entities listed on the London Stock Exchange to report their annual GHG emissions in their annual reports. It can be stated that this Regulation improves the transparency of the CSR practices. Moreover, implementing this Regulation made information about the GHG emissions more easily accessible by investors, regulators and the society. One way of making entities decrease their pollution is by applying mandatory reporting. With the help of the new reporting regulations, companies can demonstrate their devotion towards the society and show that their

organizations are acting in the best ethical way and following their moral obligations. In his study, Kruger (2015) states that "firms most heavily affected by the new regualtion experience significantly positive valuation effects" (Kruger, 2015). This can be explained due to the increased interest of investors in more sustainable companies. Thus, it can be expected that countries which have implemented mandatory ESG practices will have positive valuation effects compared to jurisdictions employing such practices voluntarily.

Even though the large amount of the ESG legislative sources are EU-derived, still there are some which are specifically made and used in the UK. For example, every country has its own Corporate Governance Code even though there are similarities in the practices being included in it. Followed by this, the results of this study may differ for countries which do not implement exactly the same practices. Countries implementing more mandatory disclosures and implementation of ESG practices will vary from one that does not.

Chapter three

Literature review

3. Background and Empirical Research

The constant change in the corporate world has led to the occurrence of many business scandals – either because of poor CG policies, environmental negligence or intended accounting errors. Example of this can be the unsuccessful investment monitoring of institutional investors in 2008 which led to the biggest crises in history. Other accounting scandals which needed the involvement of regulatory bodies include WorldCom, Enron (Vinten, 2003). In addition to this, there are examples of major prior social and environmental disasters which were being accompanied by countless unpleasant consequences including and not limited to a worsen firm's performance. Example for this can be the massive British Petroleum disaster during 2010. This event caused not only a significant environmental and social issues but also many financial losses "totaled over $20 billion" (Uhlmann, 2010). Followed by these undesirable events, the importance of having good board of directors with the right composition and following ESG practices became vital for companies' existence and good financial position. This study assumes that board composition features and ESG investment, represented using ESG scores, have significant impact on organizations financial and market performance. As supported by agency theory, there are existing board composition attributes which lessen the conflict between shareholders and managers and furthermore, improve firm's performance. Moreover, stakeholder theory suggests that by fulfilling the interests of much broader group of stakeholders rather than only shareholders – this can also improve financial and market performance. In this chapter, the importance of some board composition aspects and ESG performance in connection to entity's financial and market performance will be discussed based on previous literature.

3.1. Importance of ESG practices and CSR Committee

Increasing environmental recognition around the world emphasizes on the significance of exploring the impact of environmental performance on firm's financial performance (Wagner

M. , 2010)(Wagner M., 2010). Many definitions exist which have been used as a proxy for environmental performance. For the purposes of this study, ESG score, collected from Asset4 Database will be used for measuring environmental performance.

Previous authors have undertaken many different studies ~~researches~~ connected to environmental performance. However, one of the most important questions addressed is *"What are the benefits of being green?"* (Busch & Lewandowski, 2017). The mass literature have discovered a positive association between environmental and financial performance (Salama, 2005). In addition to this, many studies have described that better ESG performance leads to higher market valuations (Griffin & Mahon, 1997; Dowell, Hart, & Yeung, 2000). A possible explanation comes from the idea outlined in stakeholder theory (Clarkson, 1995). The theory proposes that by fulfilling the needs of much broader group of stakeholders, not only the shareholders, this can bring customer satisfaction, better reputation and with this in line – better performance. Thus, stakeholder theory suggests a positive association between environmental and financial/market performance in terms of higher stock returns.

In recent years, environmental performance has transformed into a well-known topic amongst academic and businesses, as well as a topic of interest for the society and markets. With this is line, there are many sustainability stock indices and diverse environmental ratings being launched, offering artificial indicators as a measure of ESG performance to the market. However, the complexity in the development of an environmental synthetic index makes it difficult to formulate evaluation methodologies consistent with sustainable development (Olmedo et.al, 2017).

In contrast, several studies exist showing a negative or no association between ESG and financial performance (McWilliams & Siegel, 2000; Auer & Schuhmacher, 2016). With this in line, every other investment not associated with achieving this goal is considered as unnecessary. Firstly, as this can be costly and secondly, new investments increase the need of interaction with other businesses which leads to agency conflicts. Auer & Schuhmacher (2016) analyse the performance of socially (ir)responsible investments in three markets, namely Asia-Pacific region, the United States and Europe. They have discovered that in the Asia-Pacific region and the United States, a socially-responsible investment influence is not for a specified industry. Moreover, they found that in Europe, there is no sign of a significant

result for the positive influence of ESG on financial performance (Auer & Schuhmacher, 2016). It can be argued that more environmentally friendly entities will have to incur a higher cost related to replacing the needed equipment with more environmentally friendly machineries. Thus, here comes the question of whether being environmentally friendly is actually beneficial for corporations and if this will result in higher profitability. Considering the occurance of higher cost, it can be derived that this will lead to reducing the financial performance in terms of the ratio measuring the capability of a firm to make profits from its assets, namely ROA. By making the extra environmental costs, it is expected that this will diminish this accounting-based performance measure. However, looking through the lenses of some return measures, such as stock returns, this might not be completely true. It can be argued that there are two points of view related to the market reaction. On one hand, some investors are socially sensitive, meaning that they are concerned about the environmental actions of entities even though this might lead to lower profitability. With this in turn, this will lead to lower stock returns. On the other hand, investors might behave in the more traditional economic theory framework. In this case, all they care about are profits. This is due to the reason that if there is a huge investment in environmentally friendly policies, this will bring lower profits and with this in turn, lower dividends. Here comes the need for further investigation – environemntally focused investors will lead to having positive association between ESG score and stock returns, while more profit-driven investors will give a rise to a negative relationship. Consideting the MVBV, it can be expected tha ESG score will affect MVBV positively or negatively. This is because of the idea that better MVBV means lower risk for corporations and better environmental, social and governance practices. However, on the other hand, better ESG score can lead to worse MVBV.

Some meta-analythic papers exist which argue that the ambiguity of these results can be assigned to the diverse methodology, geographical areas, length of investigated period being implemented (Horváthová, 2010; Endrikat et al., 2014). These inconclusive results have stimulated academics to dig deeper into this area.

The concept of ESG factors has turned into a crucial consideration for both individual and institutional investors. With time, more and more corporations have shown an increased dedication towards ESG practices so as to be recognised as a socially and environmentally

responsible and thus, perceived as a good investment. At the same time, investors have slowly started to pay more attention to whether corporations are implementing ESG practices when making investment decisions.

Previous academics (Brammer et al., 2006; Rodriguez-Fernandez, 2016; Reverte et al., 2016; Zhao et al., 2018) have discovered that there is an association between ESG and financial performance. This study will contribute to the overall literature by investigating this relationship in more depth. Based on the above discussion, it is expected ESG to have negative effect on financial performance in terms of ROA. Moreover, it can be argued that the assoiciton between ESG score and annual stock return measures can appear to be either positive or negative. Finally, it is expected the ESG score to have a positive association with MVBV. Additionally, the study will contribute by testing the effect of CSR committee presence on the firm performance.

Looking from a short-term point of view, the stakeholder approach might have a negative effect on profitability and be anti-competitive, in the long-term perspective this can improve firm's reputation, brand image and profitability (Mihail et al., 2022). Overall, these discussions show that various theoretical approaches such as the agency theory and stakeholder theory can be used to study CG issues.

3.2. Importance of corporate governance elements

3.2.1. Independent directors and firm's performance

Board independence definition has different explanations around diverse businesses which work in various environments as it has been described by distinct corporate statutes, regulators and governance codes. Nevertheless, it is widely acknowledged as a non-executive independent director, accountable for the management of the organization. Independent directors play an extremely important role in maintaining good corporation health. Moreover, their presence allows the board to preserve the adequate quality of decision-making processes. Independent directors have distinct drives and values compared to inside directors who are typically led by myopic visions (Post et al., 2011). The broad literature on CG, or more specifically board independence makes it clear that managers are being supervised better with the presence of independent members. As Biondi & Reberioux (2012) have stated

"Independence substantively means that the board member should be capable of skepticism and should have the courage to question executive decisions". By having this in mind, it can be derived that with better monitoring of management there will be a lower chance of undertaking fraudulent activities. Additionally, management will be more concentrated on the long-term health of the organisation and furthermore, implement a better reporting system. A relatively recent study undertaken by Liu et al. (2015) has been focused on investigating the relationship between board independence and firm performance in China. The authors based their study on 2057 firms listed on the Shanghai and Shenzhen stock exchange from 1999 to 2012. Their results show that a positive association exists between independent directors and firm's financial performance in China. Other studies which have commenced country-specific examinations found similar results (Black & Khanna, 2007; Black & Kim, 2012). This study will contribute to the already existing literature by investigating the association between board independence and financial and market performance for UK FTSE All-Share Index entities. Followed by previous studies and considering the agency theory point of view, a positive relationship is expected.

3.2.2. Gender diversity and firms' performance

As a result of the many recent accounting scandals and the financial crisis of 2007-2008, the improvement of boardroom effectiveness became the number one task among corporations. Hence, one of the most crucial boardroom developments to enhance CG has been the incorporation of higher board diversity (Hillman et al., 2002). Gender diversity is an important matter which should be taken into serious consideration. However, despite its significance this continues to be one of the biggest issues among many companies. Statistics show that today "more than a third (34.3%) of FTSE 350 board positions are now held by women" (Gov.uk, 2021). Compared to 2015 results which indicated that only 21.9% of the FTSE350 board positions are taken by women, it can be seen that there is a slow but improving phase. Data on the 2019 US demonstrates that women directorships equal to 26.1% while in Europe is about 28%. Still, it is widely accepted that having more women on the board can bring various advantages. It has been acknowledged that "gender-diverse workforce gives easier access to resources, such as various sources of credit, multiple sources of information, and wider industry knowledge" (Badal, 2014). Looking from the perspective that gender

diversity is a function of a good CG gave a rise to an increase in the attention of the academics on the relation between a firm's economic results and gender diversity (Carter et al., 2010). In their study, Campbell & Minguez-Vera (2007) investigated the association between gender diversity and firm financial performance by utilising non-financial entities listed on the Madrid continuous market between the years 1995 and 2000. Their results show that gender diversity has a positive effect on firm value. Many authors supported this view (Farrell & Hersch, 2005; Terjesen et al. 2009; Garanina & Muravyev, 2019; Simionescu et al., 2021). A variety of justifications exist which can explain these results. Women have been indicated to be distinct to men in many ways. Firstly, they are more cautious when taking risks compared to men (Croson & Gneezy, 2009). Secondly, the interest of investors and analysts towards socially responsible investments has increased drastically. Put simply, the existence of gender equality has turned into a beneficial investment variable. Additionally, this promotes the interest for the shares of these respective companies and in line with this, it increases their market values (Bear et al., 2010). Looking from the lenses of agency theory, Ain et al. (2020) demonstrated that boards with a higher percentage of women directors record a better tendency to lower agency costs in comparison to their token involvement.

Based on the above discussion, it can be stated that if entities want to achieve better performance, it is essential for them to maintain gender diversity at all of their business levels. Thus, a positive relationship it expected between financial and market performance and board diversity.

3.2.3. Board size and firm's performance

As previously disucssed, agency theory is all about finding different mechanisms which can solve the issues arising between owners and managers (Fama, 1980; Fama & Jensen, 1993). With this in line, the board of directors is perceived as a good instrument which can work on aligning the conflicting interests of principal and agent. Therefore, it can be presumed that boards which have higher number of participants could accomplish better control on managers comprated to those with smaller number of members (Frooman, 1999; Mak & Li, 2001). However, a linear association between board size and firm's performance should not be taken for granted even though the concept behind agency theory shows a positive relation. Nonetheless, the positives and negatives of adding an extra member to the

board should be taken into consideration. An advantage of appointing a new member to the board comprises of the knowledge, new ideas, experience that will be brought to the company and the possible capability for better monitoring (Wu, 2013). In contrast, some drawbacks could arise as well, such as difficulties in coordination and exchanging information. Consequently, several academics have dedicated their papers on questioning what is the best possible number of board members and whether this matter for the firm's financial performance (De Andres & Vallelado, 2008).

Contrasting, some academics have found results which are not in line with the agency theory ideas. A study carried out based on 164 Indian companies found out that "smaller boards are more efficient than the larger ones, the board size limit of six suggested as the ideal" (Garg, 2007).

Long ago, Kathuria & Dash (1999) investigated the relationship between board size and corporate financial performance. To undertake their study, they have used 504 Indian entities from 18 different industries for the period 1994-1995. Their findings indicate that board size plays significant role in influencing firm's financial performance. However, they have also found that "the contribution of an additional board member decreases as the size of the corporation increases" (Kathuria & Dash, 1999). Nevertheless, the authors have selected a period of two years only. In that case, they inevitably accept that these years represent others.

The extensive literature of this topic commonly anticipates that board size has negative effect on corporation's performance which is in contrast to the idea of agency theory stating a positive relationship exists. Based on the above discussion, the expected relationship is negative.

3.2.4. CEO duality and firm's performance

Considering AT, the separation of the Chairman and the CEO leads to an increase in the independence of the board of directors from the management. Moreover, "the presence of independent directors and the separation of the CEO and Chairman aims at protecting investors against managerial opportunism" (Michelon & Parbonetti, 2012). It gives the extreme power and authority to one individual to follow more personal interests, alter

decision-making process and thus, disrespect those of the main shareholder (Jensen M. , 1993). With time, separation of the two roles have been highly suggested and implemented. In view of agency theory, the dispute and costs which occur due to the principal-agent issues can be lowered in the cases when the CEO and the Chairman are two roles performed by different individuals. This can lead also to better firm performance.

Long ago, Baliga et al. (1996) examined the relationship between duality and firm performance. Based on Fortune 500 companies at the end of 1990, they have found that "the market is indifferent to changes in a firm's duality status" (Baliga et al., 1996). Duru et al. (2016) have found tha CEO duality has significant negative impact company's performance. Many authors supported the view that CEOs with a dual role harm firm's performance (Uyar et al., 2021). Thus, a negative relationship is expected between financial/market performance and CEO duality.

Thus existing research has shown a consistent relation between corporate governance and future firm performance. Although the focus of this study is on the effects of ESG on future performance given that both ESG can be viewed as another outcome of sound corporate governance we also examine the effect of traditional corporate governance characteristics to future performance, to ensure that our results are not confounded by possible correlation between our ESG metrics and other corporate governance variables. To examine whether the relation between ESG characteristics and future performance affected by the presence of stronger corporate governance, we also present results interacting the constructs of ESG with our proxies for corporate governance.

To my knowledge, there is no previous research paper investigating in such depth the relationship between ESG score and financial and market performance. Additionally, the contribution of this study to the already existing literature is that the UK FTSE All-Share Index companies have been investigated in a large time frame – from 2009 to 2020. No previous paper examined this question focusing on such a recent period. Moreover, the study incorporates the effect of CSR Committee on firm's performance – relationship which has not been extensively investigated. The empirical research aims to contribute to the overall literature, in regards to the UK listed companies, based on finding the ESG effect on firm's financial and market performnce. Question that has been generating unclear answers.

Chapter four

Methodology

4. Research design

As with time, ESG became more and more important for large and small corporations, the paper will investigate whether companies that have better ESG score have also superior financial and market performance. Additionally, the study will test whether corporations with higher ESG score and better corporate governance mechanisms will lead to better financial/market performance. In this chapter, the sample selection process will be described together with the data collection technique. Followed by this, each of the variables used for this paper is going to be explained, together with their corresponding measures. Furthermore, a regression model is being created.

4.1. Dataset

The United Kingdom is "a major international trading power, with the fifth-largest economy in the world according to the World Bank Group, the second-largest economy in the European Union" (export.gov, 2019). Having one of the biggest economies in the world, the effects of ESG on the company's financial and market performance and thus, its management has been examined. The study can be interpreted also in the concept of other countries with developed economies. However, it will differ from the ones with economically developing/emerging countries. The reason for this can be due to the different stages of implementation of good and efficient CG practices.

Additionally, the UK has one of the largest and most sophisticated markets. Following this, the initial sample population includes all companies listed on the FTSE All-Share Index representing "98-99% of the UK market capitalisation" (FTSE Russell, 2021). The FTSE All-Share Index includes FTSE 100, FTSE 250 and FTSE Small Cap companies. Hence, this empirical research is not solely based on large corporations. The primary resource for the collection of the data for the purposes of this research is Asset4 for corporate data and Refinitiv

Datastream for financial data. Refinitiv Datastream is the world's most comprehensive financial database. Asset4 is a Thomson Reuters business that provides ESG information based on more than "250 key performance indicators (KPIs) and around 750+ individual data points along with their original data sources" (Thomson Reuters, 2013). The datastream has been globally recognised as a leading source of ESG data.

To demonstrate the empirical element of this paper, an initial total sample of 4950 companies listed on the FTSE All-Share Index for the period from 2009 to 2020 has been collected. The entities were drawn from different industries. The process of cleaning the data, final sample and breakdown of industries included in this paper have been represented in Table 1 and Table 2. As a first step after the collection of data, all organisations which had missing CG or financial data have been excluded from the sample. There were 2094 observations with incomplete data. Subsequently, as a second step, all the financial, insurance and real estate institutions (SIC codes from 6000 to 6799), totaled 660 have been removed from the sample. This led to a total number of 2196 observations for the 12-year period from 2009 to 2020.

CG variables used for undertaking this empirical research are board size, presence of CSR committee, gender diversity, CEO duality, directors independence. All of the corporate data have been collected from Thomson Reuters Asset4 Datastream. The firm specific factors representing firm debt, size, growth, financial and market performance have been gathered from Refinitiv Datastream. All of the variables explained above, their definition and measurements are presented in Table 3.

4.2. Methodology

4.2.1. Regression model

To investigate Hypothesis 1, the effect of environmental performance on a firm's financial and market performance, the following generalized linear regression models have been used:

Model 1A:

$$ROA = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 DEBT + \beta_4 SIZE + \beta_5 IND1 + \beta_6 IND2 + \varepsilon$$

Model 1B:

$$ROA = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 DEBT + \beta_8 SIZE + \beta_9 IND1 + \beta_{10} IND2 + \varepsilon$$

Model 1C:

$$ROA = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 DEBT + \beta_8 SIZE + \beta_9 ESGxCEOCHAIR + \beta_{10} ESGxBS + \beta_{11} ESGxFEM + \beta_{12} ESGxIND + \beta_{13} IND1 + \beta_{14} IND2 + \varepsilon$$

Model 2A:

$$MVBV = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 DEBT + \beta_4 SIZE + \beta_5 IND1 + \beta_6 IND2 + \varepsilon$$

Model 2B:

$$MVBV = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 DEBT + \beta_8 SIZE + \beta_9 IND1 + \beta_{10} IND2 + \varepsilon$$

Model 2C:

$$MVBV = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 ESGxCEOCHAIR + \beta_8 ESGxBS + \beta_9 DEBT + \beta_{10} SIZE + \beta_{11} ESGxFEM + \beta_{12} ESGxIND + \beta_{13} IND1 + \beta_{14} IND2 + \varepsilon$$

Model 3A:

$$STOCKRETURN = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 DEBT + \beta_4 SIZE + \beta_5 IND1 + \beta_6 IND2 + \varepsilon$$

Model 3B:

$$STOCKRETURN = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 DEBT + \beta_8 SIZE + \beta_9 IND1 + \beta_{10} IND2 + \varepsilon$$

Model 3C:

$$STOCKRETURN = \beta_0 + \beta_1 ESG + \beta_2 FEM + \beta_3 INDEP + \beta_4 CEOCHAIR + \beta_5 BS + \beta_6 CSRCOMMIT + \beta_7 DEBT + \beta_8 SIZE + \beta_9 ESGxCEOCHAIR + \beta_{10} ESGxBS + \beta_{11} ESGxFEM + \beta_{12} ESGxIND + \beta_{13} DEBT + \beta_{14} SIZE + \varepsilon$$

Where:

β_0 Intercept

$\beta_1 - \beta_{14}$ Regression coefficients

ε Error term.

4.2.2. Measurement of variables

4.2.2.1. Dependent variables

Table 3 summarizes the expected relations between the variables and their respective measurements. Regarding the dependent variable, firm's performance, two measures have been implemented – accounting-based performance (ROA which measures the capability of a company to make profits from its assets) and market-based performance (Market-to-book ratio and annual stock returns) (Marr, 1994; Peloza, 2009). These are some of the most broadly used proxis as they reflect the general company's financial health. Previously, many academics have used these measures to represent firm's performance (Hamann et al., 2013; Rodríguez-Fernández, 2015; Liu et al., 2015; Muchemwa, Padia, & Callaghan, 2016). Both, accounting- and market-based methods cannot be considered as perfect methodolgies. On one hand, the accounting-based approach have been used to apprise actions affecting organisations in the short-term. For example, increasing firm's operating expenses. On the other hand, market-based methods apprehend "investors" long-term perceptions of the future profitability of a firm's current or recent management practices which account for financial outcomes that may manifest differently over the long term as an issue matures" (Delmas et al., 2015).

4.2.2.2. Independent variable

 ESG score (proxy for environmental performance) is the independent variables for this paper, which takes the value from 0 to 100. ESG score measures firm's ESG performance based on data reported in corporations websites, ESG reports, annual reports, code of conduct, etc. It includes ten main categories, namely resource use, emissions, innovation, management, shareholders, CSR strategy, Workforce, Human Rights, Community and Product Responsibility (Figure 2).

4.2.2.3.   *Control variables*

Previous studies have recommended many different firm specific characteristics, such as firm size, sales growth, firm age, firm risk to be used as control variables (Huang, 2013; Naciti, 2019; Alsayegh et al., 2020; Cherian, et al., 2020; Feng, Groh, & Wang, 2020; Tjahjadi, Soewarno, & Mustikaningtiyas, 2021). Thus, this paper will include the following control variables - industry, firm debt and firm size. All control variables have been collected Refinitiv Datastream. Three industries have been used – Manufacturing, Retail and Services. For the purposes of this study, when implementing the empirical research, one of the industries has been dropped. The firm debt will be measured using the ratio of Total Debt/Total Assets. Firm size, will be presented as the natural logarithm of market capitalization (MC). Additionally, the study incorporates some corporate governance characteristics as control variables. Gender diversity (FEM) is the variable showing the board diversity of a company. It is measured as the percentage of females on board; Independent directors (INDEP) represents the percentage of independent board members as reported by the company; CEO duality (CEOCHAIR) is a dummy variable which takes the value of 1 if the CEO becomes Chairman even if he/she remains CEO and 0 if the Chairman was never the CEO; board size (LNBS) denotes the natural logarithm of the number of members on board; presence of CSR committee (CSRCOMMIT) is a dummy variable taking the value of 1 if the company has a CSR committee and 0 if it does not.

4.3.   Econometric analysis

In order to ensure that the model properties are sufficient, before undertaking regression analysis, some econometric testing have been applied[1].

4.3.1.   Test for outliers

The first important step that needs to be considered before performing statistical analysis is the detection of extreme outliers. The outliers needs to be discovered as they can affect the precision of the model. Outliers are considered as "observations that do not follow the pattern of the majority of the data" (Rousseeuw & Zomeren, 1990). These outliers can cause a lot of problems for a statistical research such as wrong results, missing significant

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[1] All the econometric analysis undertaken, together with the empirical results, have been generated using SPSS Statistical Software.

findings. Thus, it is important to be spotted and corrected. Ghosh & Vogt (2012) describe outliers as "an observation far away from most or all other observations". Majewska (2015) supported this view by pointing out that outliers are any "points that do not fit the model of the rest of the data". To detect influential points, DFFITS statistical method has been applied. The method measures "how much an observation has affected its fitted value from the regression model" (Rahman et al., 2012). Extensively adopted methods include DFFITS, DFBETAS, Cook's Distance (Neter et al., 1996). However, for the purposes of this study and following previous statistical research (Rahman et al., 2012), DFFITS method has been used for detecting extreme values. DFFITS for each observation has been generated using the SPSS statistical software. An observation is considered as influential if it fulfills the following equation: $|DFFITS_i| > 2 * \sqrt{\frac{k+1}{n}}$, where k is the number of "x" variables and n, the number of observations. Thus, a large DFFITS is considered to have a value over 0.14155. In addition to this, boxplots have been created for each variable. That way, extreme outliers can be discovered (Majewska, 2015).

In the case where some observations are not reasonable, the researcher should undertake some actions on whether to abandon these observations or at least treat them in such a manner which will diminish their negative consequence on the overall results (Dixon, 1953). Thus, Ghosh & Vogt (2012) have explained that genuine outliers can be treated in three main ways which are as follows: „(1) keep the outlier and treat it like any other data point; (2) winsorize it (i.e. assign it lesser weight or modify its value so it is closer to the other sample values); or (3) eliminate it (drop it from the sample)." For the purposes of this study, the influential observations have been fixed by winsorizing at 1% and 99%.

4.3.2. Multicollinearity

The second step undertaken as part of the econometric analysis is multicolinearity. Daoud (2017) have undertaken a research based on multicollinearity and its reasons and effects on the trustworthiness of the regression model. He defines multicollinearity as "a statistical phenomenon in which two or more predictors variables in a multiple regression model are highly correlated" (Daoud, 2017). Similarly, Katrutsa & Strijov (2017) explained the event as a "strong correlation between features that affect the target vector simultaneously".

However, a solution should be undertaken for every problem. Based on quesionnaire survey data, Shrestha (2020) have presented three main techniques for identifying multicollinearity namely Pairwise Scatterplot and Correlation Coefficients, Variance Inflation Factor (VIF) and Eigenvalue Method. For the purposes of this study, the VIF has been utiliesed. The method used to "indicate how much of the variance in the dependent variable explained by the predictor variables is inflated" (Lavery et al., 2017). This study will follow the thresholds explained in Shrestha (2020) study. The author described that VIF of 1 suggests that no correlation exists between the specific variables. Value of $1<VIF<5$ describes a moderately correlation between variables. Results between 5 and 10 show high correlation. Finally, values above 10 indicate the existence of multicollinearity (Belsley, 1991). Followed by this, in this study, variables which have VIF smaller than 5 will be utilized for generating the empirical results for this paper while the ones with VIF higher than 5 should be excluded so as not to alter the findings.

Based on the above discussion, multicollinearity has been tested using VIF. Table 4 represents the VIF and 1/VIF for all the variables. The results show that there is no multicollinearity issue.

4.3.3. Heteroskedasticity

The next part of the econometric analysis is to test for homoscedasticity and correction of heteroscedasticity, if present. Homoscedasticity is described as "an assumption that is requrred to ensure the accuracy of standard errors and asymptotic covariances among estimated parameters" (Rosopa et al., 2013). On the other hand, heteroscedasticity "is a systematic change in the spread of the residuals over the range of measured values" (Frost, 2021). Heteroscedasticity is an issue due to the fact that OLS regression accepts the idea that all residuals are representing population which has a constant variance (homoscedasticity). Thus, it is important if homoscedasticity is valuated to be corrected. One way to test for the presence of heteroscedasticity is to generate scatter plots using unstandardised predicetd values and standardized residuals. For the purposes of this study, scatter plots with standardized residulas versus unstandardized prediced values have been produced presented in Figures 3A, B and C. Based on the generated results, it can be seen that there is no valuation of homoscedasticity. Put simply, there is no violation of independence.

4.3.4. Normality

The final step prior to testing the research hypothesis and generating empirical results, is to test if the residuals are normally distributed. Normal distribution is "the probability function that shows how the variables of a population (or sample) are distributed" (Dholepat, 2020). However, the whole statistical context is based on this specific assumption. Thus, it is important to test it before undertaking statistical analysis. Different tests exist which can be used for assessing the assumption that a sample is taken from a normally distributed population. Das & Imon (2016) have presented the two existing types of tests, namely analytical and graphical. Some of the graphical methods they talk about include histogram and Quantile-Quantile (Q-Q) plot. Histogram is considered as one of the simpliest graphical way to test for normality. It gives a visual assessment on whether the distribution has the form of a bell or not. Data having a bell shape is considered as being normally distributed. Additionally, it provides understanding about the symmetry and skewness (Das & Imon, 2016). On the other hand, the Q-Q plot "compared the quantiles of a data distribution with the quantiles of a standardized theoretical distribution from a specified family of distributions" (Das & Imon, 2016). Supremely, the points included in the Q-Q plot should follow the diagonal line. Furthermore, some of the emprical distribution function tests include Kolmogorov-Smirnov test, Shapiro-Wilk Test, D'Agostino-Pearson Omnibus test and many more. The null hypotheis of Kolmogorov-Smirnov test and Shapiro-Wilk Test show that the errors are normally distributed.

For the purposes of this study, normality will be assessed using three methods, namely Q-Q plot, hystogram and Shapiro-Wilk test. The first step is to calculated the Shapiro-Wilk test, the results of which are shown in Table 5. The results of the Shapiro-Wilk test gives zero for all the variables which means that the normality null hypothesis is rejected, confirming that there is normality. The second step includes the representation of Q-Q plots and histograms, shown in Figures 4, 5 and 6. For the errors to be normally distributed, they should have a bell shape and be symmetrically distributed around zero. Moreover, the points on the Q-Q plot should fall on the diagonal line. The results support the finding from Shaprio-Wilk test showing that the normality assumption has been violated. The histogram presented in Figure 5 do not appear to follow bell shape not to be symetrically distributed around zero.

Aditionally, the Q-Q plot deviates from the diagonal line that must be followed. However, according to the Central Limit Theorem, if the sample size is considered as "large", then any deviation from the assumption of error normality is not expected to create an issue in the estimator hypothesis tests. Thus, correction is not needed in this case.

Chapter five

Empirical results

5. Empirical results

5.1.   Descriptive statistics and Correlations

This section will start with presenting some descriptive statistics (including mean, median, standard deviation, minimum, maximum, 25% and 75% Percentiles) and correlations of all variables used in the regression models. The sample contains of 2196 observations between the years 2009 and 2020, collected from Thomson Reuters Asset4 and Refinitiv Datastream. Table 6 (a) shows the initial descriptive statistics. The first dependent variable, ROA, shows a mean of 6.75 which is generally considered as a good ratio. Minimum value of -54.66 and maximum of 269.11. The higher the ROA, the more efficient an entity is at generating profits. This is expected as the study investigates all companies listed on the FTSE All-Share Index which includes small companies with not so good financial and market performance (Minimum -54.66) as well as large firms with good performance (Maximum 269.11). Considering MVBV, it can be seen that the highest score is 5539.06, while the lowest -1066.16. The MVBV is a ratio used by investors to "show the market's perception of a particular stock's value" (CFI, 2022). On one hand, a low ratio shows undervalued stocks, considered as a bad investment. On the other hand, higher MVBV could represent an overvalued stock, meaning having a good performance. For stock returns, the highest stock return appeared to be 5.6167 and the lowerst -0.8041 with mean 0.1394. Gender diversity on board for this period is low. The mean percentage of women of board is 20.16% while the highest gender diversity is 64.67%. These results have not been expected considering the importance of this topic during the recent years as well as of today. Surprisingly good results have been generated for the independence of directors which is extremely crucial element of the board composition. The results show a mean of 58.34% with minimum of around 14% and maximum of almost 94%. Looking at these results, it can be stated that most of the companies listed on the UK FTSE All-Share index have high percetnege on board independence with some

small exceptions. ESG score has interesting results showing that the mean of companies is to have a score of around 53% which is very high considering that ESG reporting is not currently mandatory in the UK. However, there are some metrics which are mandatory which might lead to the high scores. Nevertheless, still there are companies with low score of 0% which might be the smaller companies listed on the FTSE All-Share Index which are not looking that intensive for investors attention. Researches show that score rating between the range of 0 and 25 is considered as having "poor ESG performance and insufficient degree of transparency in reporting material ESG data publicly" (Refinitiv, 2021). The highers ESG score equals to 94.23%. Regarding the board size, as previously stated Garg (2007) found that smaller boards are considered more efficient than large ones. Moreover, they argued that the perfect board size consists of six individuals. In this paper, the mean of board of directors is around 8 which is not far away from the ideal number of six members identified in Garg (2007) study. However, the maximum number of board members discovered is 17 which is cosidered as very high. This is because even though more board members can bring new ideas and more expertise to the business in general, it also means having more challenges managing the board. DEBT is calculated using the ratio total debt/total assets. The mean shows that around 23% of firm's assets are financed by creditors and 77% are financed by shareholders. The maximum is 107% indicating a company has more debt than assets. In contrast, the minimum is 0 meaning that the organisation is carrying no debt. Firm SIZE is proxied using the natural logarithm or market capitalization. The maximum and minimum values are 12.59 and -3.91 respectively. Looking at the results of the industries descriptive statistics, as it can be seen, both of the variables IND1 and IND2 have minimum and maximum, 0 and 1 respectively as they are being turned into dummy variables. The results of their mean are 0.61 for IND1 and 0.19 for IND2. Two types of interactions have been created, namely ESGxFEM and ESGxCSRCOMMIT. Both of the interactions have a minimum value of 0 and maximum of 4528.50 and 94.23 respectively. Table 6 (b) represents the descriptive statistics after undertaking winsorization. Additionally, natural logarithm has been used for the variable BS.

Verifying on the existence of association between the dependent and independent variables, Table 7 displays the correlation matrix.

The correlation between ROA, MVBV, STOCKRETURN and ESG appeared as negative and statistically significant at 1% level. As previously explained, the negative association between ROA and ESG can be due to the idea that ESG practices will lead to lower profitability in terms of ROA. Corporations will increase their costs in relation to environmental spending and with this in turn, reduce financial performance. In terms of STOCKRETURN and ESG, the explanation for the negative correlation is the idea that shareholders are not concentrated on the ESG practices but solely on pure profits. Shareholders might even penalize someone who makes a huge investment in the environmental aspect because this will lead to lower profits and hence, lower dividends. Thus, the increase in ESG practices will lead to a decrease in market performance. The three dependant variables also appeared as negatively correlated with INDEP and CSRCOMMIT. However, the correlation appeared significant only in terms of STOCKRETURN. These results show that the performance of the independent directors has been jeopardized. Even though companies might comply with the number of appointed independent directors, several ways exist which can offset the powers of these directors (Wang & Oliver, 2009). For example, independent director with irrelevant background, not enough experience or no knowledge might be appointed by the executive directors. This will weaken the corporate performance. Surprisingly, the correlation between ROA, STOCKRETURN and CEO duality apeared as positive. However, it is significant only with ROA, at 1% significance level. This result can be interpreted with the help of the stewardship theory. The main idea behind it explains that the CEO, left on his own, will act as responsible steward of the company. Thus, by exercising the role of CEO and Chairman, having more in debth knowledge about the corporation, this will help improve their performance of the entity. Nevertheless, last but not least, the correlation between ROA, MVBV and STCOKRETURN indicated negative significant sign with CSR Committee, meaning that the presence of CSR Committee will lead to lower financial/market performance.

Generally, it can be observed that the variables are not highly correlated between each other. Looking at the findings, one of the highest correlation is between SIZE and ESG, significant at 1% level which shows that the bigger the size of a company, the better its ESG performance will be. This result is logical as larger organisations are under more scrutiny from

the government and the public for maintaining good environmental performance. Thus, in order to look more legitimate and to fulfill other stakeholder interests, not following only the shareholders views, they will try to look greener and more environmentally friendly. However, sometimes this can be tricky as even though they look greener, it is difficult to see what is hidden "behind the scenes". High positive significant (at 1% level) correlation has been spotted between board size and ESG score, indicating that having more board members leads to better ESG score among corporations. Another high significant correlation has been found between CSRCOMMIT and ESG. It shows that there is positive, significant at 1% level, correlation of 0.437 explaining that the presence of CSR Committee gives a rise to better ESG score. This results have been expected. To support this, Baraibar-Diez & Odriozola (2019) found that CSR Committee variable "correlated positively and significantly with all ESG and economic scores". Followed by this, it can be observed that, at 1% level, INDEP and ESG score are positively and significantly correlated. Put simply, higher board independence gives better ESG score. With years, the board independence has increased. Moreover, it is a significant part of the value creation process as well as the decision making process related to environmental issues. Nonetheless, the next significant correlation which appears in the results is between ESG score and FEM. There is positive significant correlation between the two varibales at the 1% significance level. This relationship has been expected as females on board often consider other ideas, not focusing only on the firm's performance and enhancing shareholder value. Some other high correlations are between MVBV and ROA, positive significant (at 1% level) correlation, and between IND2 and IND1, negative significant (at 1% level) correlation.

5.2.   Regression results

Table 8 (Panels A, B and C) illustrate the regression results for all the models being previously developed. Models 1A, 1B and 1C test the effect of the independent variables on ROA. Models 2A, 2B and 2C have MVBV as dependnet variables and Models 3A, 3B and 3C use annual stock returns to find answers to the two research questions previously stated. Based on the generated results, ESG score appears to be statistically significant in Models 1A, 1B, 2A, 3A and 3B (at 1% significance level). Starting with Models 1A and 1B, it affects negatively the financial performance, namely ROA. By way of explanation, it means that by

integrating information about company performance related to economic, environmental, social and corproate governance performance, firm's financial performance deteriorates in terms of the accounting-based performance measure – ROA. As previously discussed, this can be explained due to the idea that by integrating more ESG practices, companies will increase their additional costs and thus, decrease they financial performance in terms of ROA. Model 2A shows negative statistical association between ESG and MVBV, meaning the better ESG score a company has, the worse its MVBV will be. Models 3A and 3B also show negative significant relationship between ESG and annual stock returns. As previously discussed, it can be debatable whether this relationship is negative or positive. Based on the generated results, it can be derived that shareholders do not give that much attention to the society and the environment rather than profits. Put simply, shareholders value firms based on the traditional economic theory, assuming that individuals make rational choices aimed at maximasing profits despite the negative environmental impact they might have. Moreover, the findings deviate from the stakeholder theory concept indicating that satisfying the needs of much broader stakeholder group will bring many financial and non-financial benefits to organisations. The results support the point of view that investors are focused only on deriving profits for the corporation and thus, do not consider ESG as an important cocept which in terms gives a rise to a negative association. Several previous empirical papers has found negative or no association of ESG on financial performance (Friedman, 1970; McWilliams & Siegel, 2000; Auer & Schuhmacher, 2016).

The variable FEM characterizes board diversity. Supported by many previous studies (Campbell & Minguez-Vera 2007; Farrell & Hersch, 2005; Terjesen et al. 2009; Garanina & Muravyev, 2019; Simionescu et al., 2021), the expected relationship between FEM and firm performance is positive. Board diversity, as one of the leading global issues in the business world, has been showing a significant progress in the representation of women on board which has led to numerous financial and non-financial benefits. The results of this study demonstrated positive significant relationship between FEM and firm performance in models 1A, 1B, 2A, 2B and 2C, showing that higher female percentage on board gives a rise to better performance in terms of ROA and Market-to-book ratio. These results are consistent with the abovementioned studies examining this relationship. Having more women on board can be

considered as more beneficial as they are adept at diverse strategies, improving ESG, monitoring management and many other aspects including but not limited to the firm's financial performance. In Models 3A, 3B and 3C though, the variable FEM is negatively and statistically significant at the 1% significance level. Thus, these models do not support this view as the relationship between FEM and STOCKRETURN is negative. This explains that in terms of STOCKRETURNS, more females on board will lead to worse annual stock returns. This might be due to the idea that, as previously mentioned, females are not solely concentrated on financial performance but also on other non-financial aspects which can bring more benefits to the corporation in the long- rather than short-term. Moreover, since they are more focused on non-financial aspects, this might undermine the annual stock returns.

Another CG variable being examined is INDEP. Looking at the findings, the variable INDEP is not statistically significant in all of the models. Thus, this is not aligned with the expectations of this paper and the results of prior studies. It has been argued that having more independent directors reduces fraudulent activites and leads to better corporate management (Biondi & Reberioux; 2012). However, surprisignly these models do not support the view that higher independence gives better financial performance in terms of all the three measures of firm performance. This might be due to the idea that the directors were not truly independent and had personal, financial, and/or social ties with the shareholders which might have influenced their independent judgement. Nonetheless, this is not aligned with the expectations of this current research paper and with the idea that independent directors are found as a key to coporate credibility. Additionally, these findings contradict with the idea behind agency theory which supports the view that one of the most important mechanisms to reduce agency conflicts is by appointing more independent directors which are not short-sighted and focused on personal gain.

Regarding the variable CEOCHAIR, as previously discussed, the major group of academics (Michelon & Parbonetti, 2012; Duru et al., 2016) as well as the concept of agency theory suggest that CEO duality can be harmful for firm performance as it compromises two very important functions – the control and monitoring of an entity. In contrast, the results of this study show that in Model 1B, the CEOCHAIR is positively and statistically significant at the 1% significance level. Put simply, if the roles of CEO and Chairman are exercised by the same

individuals, this will bring better accounting-based (ROA) financial performance. CEO duality has been long criticized for the poor corporate financial performance and failure of entities to adjust to changes in the environment. However, the current paper found different point of view and refuted this statement. The idea behind the positive association between CEO duality and financial performance can be supported by the stewardship theory, stating that joint leadership structure may improve firm's financial performance (Ramdani & Witteloostuijn, 2010; Isik, 2017). Put simply, it can be argued that managers who are governing the company are considered as dependable individuals and good leaders of it. Additionally, as an insiders they are aware of entity's strategic information compared to outside independent parties represented on the board of directors. Thus, if the CEO plays the role of Chairman as well, this can bring powerful leadership and with this, improved profitability. Nevertheless, the results of the other models does not appear to find any significance between CEOCHAIR and firm performance. However, despite the insignificance, it can be seen that the association between CEOCHAIR and market-based measures, namely MVBV and annual stock return, is negative which is supported by the concept of agency theory.

The next variable the impact of which is going to be examined is LNBS. As previously discussed, many viewes has been discussed on this relationship. Nevertheless, this paper incorproated the concept that smaller board size is more efficient compared to a larger one (Garg, 2007). Models 1B and 3B have found that negative relationship exists between board size and firm performance at 1% significance level. Thus, the expectations for this variable have been met. The relationship shows that the more directors on board can deteriorate firm's financial performance in terms of ROA and STOCKRETURN. It is true that more board members will contribute by bringing new diverse ideas, backgrounds and expertise. Nonetheless, at the same time, having more board members may deteriorate the general board efficiency, as predicted by the agency theory.

The next variable which appears to be statistically significant in Models 1B, 1C, 2B and 2C is CSRCOMMIT. The results show that having CSR Committee leads to deteriorating the financial (ROA) and market (MVBV) performance of the UK FTSE All-Share Index listed companies. A reason for this might be that having a CSR Committee means having better

concentration on ESG/CSR and thus, increasing environmental spending. Moreover, this will lead to decrease in profitability. In contrast, Models 3B and 3Cdo not show any significant association.

Considering the variable DEBT, it can be observed that is statistically significant in Models 1A, 1B, 1C, 3A, 3B and 3C at 1% level. This shows that the higher the firm's debt is, the worse its firm performance, namely ROA and annual stock returns. Contrasting, none of the models related to MVBV show any significant association between the two variables even though it is considered that organisations which have higher market-to-book ratios are having more debt, and the opposite – entities with lower market-to-book have lower usage of debt. The variable SIZE generated expected results. Again, in Models 1A, 1B, 1C, 3A, 3B and 3C, the variable appeared to be positively statistically significant at the 1% significance level. Put simply, larger companies are revealing better firm performance. These results are consistent with the study of Papadogonas (2007) who found that firm size has possitive associaiton with profitability. The variable IND1, representing the Manufacturing industry appears to be negatively and statistically significant in Models 1A, B and C and 2A, B and C at the 1% significance level. This explains that Manufacturing entities have worse financial performance in respect to ROA and MVBV. Similarly, IND2 – retail represents negative significant association at 1% level in all the models realted to ROA and MVBV and no association in the models related to annual stock returns. Thus, in the retail industry, companies have inferior performance in terms of ROA and MVBV.

For testing whether firms with higher ESG score and better corporate governance mechanisms lead to better financial and market performance, some interaction variables have been created, namely ESGxFEM, ESGxINDEP, ESGxCEOCHAIR and ESGxLNBS. The interaction variables has been used to study the moderating impact of corporate governance mechanisms on the association between ESG and fianncial and market performance. These variables did not show any significance in the models related to ROA and MVBV. However, Model 3C discovered a positive significant relationship between ESGxFEM and annual stock returns, explaining that higher ESG score and more females on board will lead to higher annual stock returns. Additionally, the interaction between ESG and LNBS showed a negative assocaiton with the annual stock returns.

Followed by the above discussion, Hypothesis 1, stating that ESG is associated with future firm performance will be accepted.

Chapter six

Conclusion and Recommendations

6. Conclusion, Limitations and Recommendations

This section draws the conclusion, illustrates some of the main limitations and gives recommendations for future studies. The primary goal of this research was to test if having a higher ESG score gives better financial and market performance. The paper implements accounting-based (ROA) and market-based (Market-to-book value and annual stock returns) measures for financial and market performance. The study is based on the UK FTSE All-Share Index companies and it comprises 2196 observations drawn from three industries – manufacturing, retail and services. The period being tested covers the years 2009-2020. The research contributes to the overall literature by providing more insight into one of the most important questions nowadays – *Does being environmentally friendly pays off?* Additionally, the current paper tests whether firms with higher ESG score and better corporate governance mechanisms, lead to better financial and market performance. A significant number of the published literature supports the hypothesis that board composition is vital to shareholders especially in the cases where agency conflict exists. Supported by the agency theory concept, it is considered that different board composition aspects can boost a firm's performance. Moreover, it can be stated that the key to a healthy company is having a good board composition which can lead to many different corporate benefits.

In today's business, companies have started implementing ESG practices more and more every day. In a global perspective, ESG investing has continuously attracted a lot of interest, with academics and investors curiousity about whether ESG practices give a rise to better financial and market performance. Stakeholders began identifying ESG responsibilities as essential so as to boost their overall performance. Previous literature shows that management, accountable for ESG matters creates an environment that enhances stakeholders' trust and firm's integrity within the society. Thus, businesses that integrate ESG practices can increase their general ESG score and be reported as having a package of diverse

benefits. In line with this, is the idea behind the stakeholder theory which supports the understanding that companies should not be concentrated only on promoting shareholders' value. Focus should be given to other stakeholders too. Even though existing theories support a relation between ESG and futute performance, there is a contradiction between the expected relations. This led to the creation of a non-directional hypothesis, stating that ESG is associated with futute firm performance.

The results of this study show that ESG score is negatively statistically significant in the Models 1A, 1B, 2A, 3A and 3B, having ROA, MVBV and annual stock returns as dependent variables respectively. The results in Panel 1 (Models 1A and 1B) show that the implementation of ESG practices will lead to decrease in the profitability (ROA). As previously discussed this can be due to the reason that corporations will increase their environemtnal costs which in turn will lead to lower financial performance in the short-term. Panels 2 and 3 (Models 2A, 3A and 3B) demonstrate that the better ESG score, the worse organisation's market performance in terms of MVBV and annual stock returns. This can be the case when shareholders behave in the more traditional economic theory and are focused mainly on enhancing profitability. Put simply, they are not interested in implementing environmental practices and reducing their negative climate impact. A reason for this is that by increasing the environmental costs, this will lead to lower profits and thus, lower dividends. Moreover, the empirical results indicated that having CSR Committee is not beneficial for companies as it hinders their performance in terms of ROA and MVBV. This is in contrast with the expectations. However, this unexpected relationship can be explained with the view that having CSR Committee will lead to the implementation of more ESG practices and thus, higher ESG expenditure which will decrease firm's profitability and performance. Following the results, Hypothesis 1 has been accepted, showing that ESG is associared with firm's financial and market performance.

ESG issues will continue to be an important topic among investors. This is because poor ESG practice or disregarding the negative environmental impact will give a rise to reputation risk, legal issues and loss of society's approval. Furthermore, this can have a lasting negative impact on corporations. In comparison, entities which have stronges ESG

performance are more stable, have the support of the society and can exercise lower cost of capital.

Like every other study, this one contains numerous limitations which are associated with the results and bring many implications. Firstly, the sample used is limited only to companies listed on the UK FTSE All-Share Index. Thus, the audience of other countries can interpret these matters in a different way. This is due to the fact that diverse nations use different corporate codes, regulations, cultural values and beliefs which may alter the relationships being investigated. Future research could consider multi-national sample. An interesting idea would be to test the difference in these results for a number of countries. Secondly, considering the relationship between board composition and financial/market performance, the study tests only a couple of board characteristics such as board diversity, independence, size, CEO duality. A future research could focus on a broader group of attributes, the effect of which is of high importance such as CEO/directors age, background, experience, tenure, education and many others. Thirdly, more variables concerning ESG could be included in the model such as environmental expenditure and how does this affect firm performance.

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Appendices

List of Tables

Table 1: Final Sample

The following table illustrates the initial and final dataset used for the purposes of this paper, together with the reasons for exclusion of some observations.

Period: 2009-2020	Number of companies
Initial sample	4950
Firms with missing corporate and/or financial information broken down into:	(2094)
• Entities with missing financial data	557
• Entities with missing corporate data	1471
• Entities with missing stock price data	66
Financial institutions	(660)
Total final sample	**2196**

Table 2: Industries

The following table represents a breakdown of the final sample between divisions in each industry.

SIC	Division	Number of companies	Industry	Number of Companies
0100-0999	Agriculture, Forestry and Fishing	0		
1000-1499	Mining	169		
1500-1799	Construction	159	Manufacturing firms	1341
1800-1999	Not used	0		
2000-3999	Manufacturing	749		
4000-4999	Transportation, Communications, Electric, Gas	264		
5000-5199	Wholesale Trade	120	Retail Firms	416
5200-5999	Retail Trade	296		
7000-8999	Services	439		
9100-9729	Public Administration	0	Services	439
9900-9999	Nonclassifiable	0		
	TOTAL	**2196**		**2196**

Table 3: Relations and measurement of variables

The following table illustrates the expected sign, abbreviation, database from which it was collected, database code and

	Expected sign	Abbreviation	Database	Database code	Measure
Dependent variable					
Financial/Market performance	(-)	ROA	Refinitiv	WC08326	Return on Assets (ROA) = Net Income/ Total Assets
		MVBV	Refinitiv	MTBV	Market to book ratio = MV/BV
	(+/-)	STOCKRETURN	Refinitv	P	Annual stock returns = (Stock price at the end of the year – Stock price at the beginning of the year)/Stock price at the beginning of the year
Independent variable					
Environmental performance	(+)	ESG	Asset4	TRESGS	Thomson Reuters ESG score (Value from 0 to 100)
Control variables					
Independent directors	(+)	INDEP	Asset4	CGBSO07V	Percentage of independent board members
CEO duality	(-)	CEOCHAIR	Asset4	CGBSO09V	Dummy variable (1- yes (CEO becomes chairman even if he remains CEO; 0-no (the Chairman was never the CEO))
Board size	(-)	BS	Asset4	CGBSDP060	Number of members on board
Presence of CSR committee	(+)	CSRCOMMIT	Asset4	CGVSDP005	Dummy variable (1 – there is CSR committee, 2 – no committee)
Gender diversity	(+)	FEM	Asset4	CGBSO03V	Percentage of women on board
Industry 1		IND1	Refinitiv		Manufacturing industry (1 – manufacturing, 0 – services and retail)
Industry 2		IND2	Refinitiv		Retail industry (1 – retail, 0 – services and manufacturing)
Industry 3		IND3	Refinitiv		Services (1 - services, 0 – retail and manufacturing)
Firm debt	(-)	DEBT	Refinitiv		Total debt/Total assets
Firm Size	(+)	SIZE	Refinitiv		Natural logarithm of market capitalization

respective measures for the dependent, independent and control variables used in this paper.

Table 4: Multicollinearity test

This table illustrates the VIF for each variable which is used to the for multicollinearity.

Variable	VIF	1/VIF
FEM	1.253	0.7981
ESG	2.021	0.4948
INDEP	1.305	0.7663
CEOCHAIR	1.049	0.9533
BS	1.533	0.6523
CSRCOMMIT	1.259	0.7943
IND1	1.717	0.5824
IND2	1.611	0.6207
DEBT	1.076	0.9294
SIZE	1.792	0.5580

Table 5: Shapiro-Walk test

This paper has implemented test for normality the Shapiro-Wilcoxon test. The null hypothesis indicates that errors are normally distributed.

H_0: The errors are normally distributed
H_1: The errors are **not** normally distributed
Normality has been tested using Shapiro-Wilk Test. If p-value is lower than 5%, the null hypothesis is rejected.

Variable	*Shapiro-Wilk test*		
	Statistic	*df*	*Sig.*
ROA	.840	2196	.000
MVBV	.272	2196	.000
STOCKRETURN	.933	2196	.000

Table 6: Descriptive statistics

(a) Initial descriptive statistics

Table 6 (a) shows the descriptive statistics of all the independent and dependent variables before testing for outliers. The dependent variable is financial/market performance. Three proxies have been used to measure it, namely ROA, Market-to-Book value and Annual stock returns. FEM represents the board diversity, and it is measured as the percentage of women on the board of directors. ESG score is proxy for environmental performance. INDEP shows the number of independent directors on the board. CEOCHAIR is a dummy variable taking the value of 1 when CEO and Chairman are two roles played by the same individual and zero, otherwise. BS represent the board size. CSRCOMMIT is a dummy variable. It takes the value of 1 if the company has a CSR Committee and zero, otherwise. IND1 indicates companies from manufacturing industry, dummy (1 – for manufacturing and 0 – for retail and services). IND2 comprises of companies which are part of the retail industry, dummy variable (1 – retail, 0 – manufacturing and services). IND3 has been excluded from the models. DEBT is measured using the ratio total debt/total assets and SIZE – natural log of market capitalization.

Variable	N	Mean	Median	Std. deviation	Minimum	Maximum	Percentiles (25%)	Percentiles (75%)
ROA	2196	0,0888	0,0675	0,1809	-0,5466	2,6911	0,0356	0,1142
MVBV	2196	16,08	2,42	217,07	-1066,16	5539,06	1,38	4,39
STOCKTETURN	2196	0,1394	0,0824	0,4600	-0,8041	5,6167	-0,12	0,31
FEM	2196	0,2016	0,2000	0,1282	0,00	0,6467	0,1250	0,2857
ESG	2196	52,41	52,19	18,82	0,00	94,23	39,10	65,38
INDEP	2196	0,5834	0,5833	0,1354	0,00	0,9375	0,5000	0,6667
CEOCHAIR	2196	0,09	0,00	0,29	0,00	1,00	0,00	0,00
BS	2196	8,80	9,00	2,24	1,00	17,00	7,00	10,00
CSRCOMMIT	2196	0,72	1,00	0,45	0,00	1,00	0,00	1,00
IND1	2196	0,61	1,00	0,49	0,00	1,00	0,00	1,00
IND2	2196	0,19	0,00	0,39	0,00	1,00	0,00	0,00
DEBT	2196	0,2334	0,2257	0,1700	0,00	1,0691	0,1027	0,3255
SIZE	2196	7,57	7,37	1,65	-3,91	12,59	6,59	8,56

(b) Descriptive statistics after winsorization

Table 6 (b) shows the descriptive statistics of all the independent and dependent variables after winsorization. The dependent variable is financial/market performance. Three proxies have been used to measure it, namely ROA, Market-to-Book value and Annual stock returns. FEM represents the board diversity, and it is measured as the percentage of women on the board of directors. ESG score is proxy for environmental performance. INDEP shows the number of independent directors on the board. CEOCHAIR is a dummy variable taking the value of 1 when CEO and Chairman are two roles played by the same individual and zero, otherwise. LNBS represents the LN of board size. CSRCOMMIT is a dummy variable. It takes the value of 1 if the company has a CSR Committee and zero, otherwise. IND1 indicates companies from manufacturing industry, dummy (1 – for manufacturing and 0 – for retail and services). IND2 comprises of companies which are part of the retail industry, dummy variable (1 – retail, 0 – manufacturing and services). IND3 has been excluded from the models. DEBT is measured using the ratio total debt/total assets and SIZE – natural log of market capitalization.

Variable	N	Mean	Median	Std. deviation	Minimum	Maximum	Percentiles (25%)	Percentiles (75%)
ROA	2196	0,0814	0,0675	0,1004	-0,1928	0,5872	0,0356	0,1142
MVBV	2196	4,93	2,42	14,23	-9,83	134,43	1,38	4,39
STOCKRETURN	2196	0.1296	0.0824	0.3964	-0.7646	1.8138	-0,12	0,31
FEM	2196	0,2012	0,2000	0,1264	0,00	0,5000	0,1250	0,2857
ESG	2196	52,41	52,19	18,82	0,00	94,23	39,10	65,38
INDEP	2196	0,5845	0,5833	0,1309	0,2353	0,8750	0,5000	0,6667
CEOCHAIR	2196	0,09	0,00	0,29	0,00	1,00	0,00	0,00
LNBS	2196	2,15	2,20	0,24	1,61	2,83	1,95	2,30
CSRCOMMIT	2196	0,09	0,00	0,29	0,00	1,00	0,00	1,00
IND1	2196	0,61	1,00	0,49	0,00	1,00	0,00	1,00
IND2	2196	0,19	0,00	0,39	0,00	1,00	0,00	0,00
DEBT	2196	0,2311	0,2257	0,1629	0,00	0,6453	0,1027	0,3255
SIZE	2196	7,61	7,37	1,50	3,79	11,64	6,59	8,56

Table 7: Correlation Matrix

Table 7 shows the correlations between variables. The dependent variable is financial/market performance. Three proxies have been used to measure it, namely ROA, Market-to-Book value and Annual stock returns. FEM represents the board diversity, and it is measured as the percentage of women on the board of directors. ESG score is proxy for environmental performance. INDEP shows the number of independent directors on the board. CEOCHAIR is a dummy variable taking the value of 1 when CEO and Chairman are two roles played by the same individual and zero, otherwise. LNBS represents the LN of board size. CSRCOMMIT is a dummy variable. It takes the value of 1 if the company has a CSR Committee and zero, otherwise. IND1 indicates companies from manufacturing industry, dummy (1 – for manufacturing and 0 – for retail and services). IND2 comprises of companies which are part of the retail industry, dummy variable (1 – retail, 0 – manufacturing and services). IND3 has been excluded from the models. DEBT is measured using the ratio total debt/total assets and SIZE – natural log of market capitalization. The sample contains 2196 observations and covers the period 2009-2020.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ROA	1														
(2) MVBV	.330**	1													
(3) STOCKRETURN	.178**	.038	1												
(4) FEM	.023	.071**	-.175**	1											
(5) ESG	-.085**	-.058**	-.136**	.387**	1										
(6) INDEP	-.008	-.016	-.085**	.322**	.408**	1									
(7) CEOCHAIR	.070**	-.009	.019	-.114**	-.145**	-.154**	1								
(8) LNBS	-.030	-.006	-.069**	.148**	.427**	.227**	-.054*	1							
(9) CSRCOMMIT	-.110**	-.130**	-.051*	.147**	.437**	.139**	-.006	.230**	1						
(10) IND1	-.097**	-.080**	-.042*	-.020	.243**	.112**	.029	.191**	.186**	1					
(11) IND2	.009	-.003	.047*	.025	-.095**	-.076**	-.061**	-.125**	-.108**	-.605**	1				
(12) DEBT	-.211**	.019	-.102**	.101**	.232**	.086**	-.096**	.162**	.135**	.007	-.030	1			
(13) SIZE	.115**	-.010	.007	.269**	.535**	.361**	-.099**	.556**	.240**	.171**	-.042	.139**	1		
(14) ESGxFEM	-.016	.024	-.173**	.887**	.696**	.409**	-.132**	.282**	.286**	.092**	-.025	.159**	.428**	1	
(15) ESGxCSR	-.104**	-.116**	-.097**	.286**	.765**	.298**	-.077**	.870**	.870**	.244**	-.114**	.200**	.449**	.541**	1

**Correlation is significant at the 0.01 level
*Correlation is significant at the 0.05 level

Table 8 (Panel 1): Empirical results

Table 8 (Panel 1) demonstrates the empirical results of the Models 1A, 1B and 1C developed for the purposes of this study. The financial performance has been measured using accounting-based (ROA). Column 2 shows the expected signs for all the variables. The sample contains 2196 observations and covers the period 2009-2020. Stars indicate the level of significance. ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Variable	Expected sign	Model 1A	Model 1B	Model 1C
(Constant)		5.085***	9.934***	1.245
		(0)	(0)	(0.824)
ESG	+/-	-0.079***	-0.049***	0.121
		(0)	(0.001)	(0.242)
FEM	+	0.030*	0.032*	0.033
		(0.090)	(0.077)	(0.533)
INDEP	+		-0.015	0.037
			(0.406)	(0.435)
CEOCHAIR	-		2.100***	3.593
			(0.004)	(0.090)
LNBS	-		-3.180***	-0.842
			(0.002)	(0.735)
CSRCOMMIT	+		-1.728***	-1.842***
			(0)	(0)
DEBT	-	-0.133***	-0.126***	-0.127***
		(0)	(0)	(0)
SIZE	+	1.590***	1.863***	1.941***
		(0)	(0)	(0)
IND1		-3.261***	-3.138***	-3.171***
		(0)	(0)	(0)
IND2		-2.522***	-2.646***	-2.689***
		(0)	(0)	(0)
ESGxFEM				-8.506E-5
				(0.928)
ESGxINDEP				-0.001
				(0.254)
ESGxCEOCHAIR				-0.032
				(0.478)
ESGxLNBS				-0.047
				(0.311)
N		2196	2196	2196

Table 8 (Panel 2): Empirical results

Table 8 (Panel 2) demonstrates the empirical results of the Models 2A, 2B and 2C developed for the purposes of this study. The firm's performance has been measured using the market-based variable Market-to-Book value (MVBV). Column 2 shows the expected signs for all the variables. The sample contains 2196 observations and covers the period 2009-2020. Stars indicate the level of significance. ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Variable	Expected sign	Model 2A (MVBV)	Model 2B	Model 2C
(Constant)		6.514***	5.861*	-2.781
		(0)	(0.045)	(0.736)
ESG	+/-	-0.074***	-0.034	0.137
		(0)	(0.135)	(0.370)
FEM	+	0.112***	0.116***	0.135*
		(0)	(0)	(0.084)
INDEP	+		-0.026	-0.050
			(0.314)	(0.472)
CEOCHAIR	-		-0.211	-1.668
			(0.845)	(0.595)
LNBS	-		1.481	5.716
			(0.334)	(0.120)
CSRCOMMIT	+		-4.018***	-4.135***
			(0)	(0)
DEBT	-	0.023	0.025	0.025
		(0.233)	(0.187)	(0.197)
SIZE	+	0.254	0.192	0.293
		(0.290)	(0.474)	(0.294)
IND1		-3.065***	-2.827***	-2.786***
		(0)	(0)	(0)
IND2		-2.786***	-2.892***	-2.871***
		(0.004)	(0.003)	(0.003)
ESGxFEM				0.000
				(0.740)
ESGxINDEP				0.001
				(0.698)
ESGxCEOCHAIR				0.033
				(0.616)
ESGxLNBS				-0.089
				(0.201)
N		2196	2196	2196

Table 8 (Panel 3): Empirical results

Table 8 (Panel 3) demonstrates the empirical results of the Models 3A, 3B and 3C developed for the purposes of this study. The firm's performance has been measured using the market-based variable annual stock returns. Column 2 shows the expected signs for all the variables. The sample contains 2196 observations and covers the period 2009-2020. Stars indicate the level of significance. ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Variable	Expected sign	Model 3A	Model 3B	Model 3C
(Constant)		0.147***	0.351***	-0.067
		(0)	(0)	(0.768)
ESG	+/-	-0.002***	-0.002***	0.006
		(0)	(0)	(0.160)
FEM	+	-0.005***	-0.005***	-0.009***
		(0)	(0)	(0)
INDEP	+		-0.001	-0.002
			(0.223)	(0.334)
CEOCHAIR	-		-0.015	-0.140
			(0.616)	(0.106)
LNBS	-		-0.118***	0.126
			(0.005)	(0.211)
CSRCOMMIT	+		0.013	0.006
			(0.520)	(0.756)
DEBT	-	-0.002***	-0.002***	-0.002***
		(0)	(0)	(0.0)
SIZE	+	0.034***	0.044***	0.049***
		(0)	(0)	(0)
IND1		-0.015	-0.015	-0.013
		(0.486)	(0.507)	(0.564)
IND2		0.032	0.025	0.027
		(0.228)	(0.348)	(0.312)
ESGxFEM				7.538e-5**
				(0.048)
ESGxINDEP				1.983E-5
				(0.579)
ESGxCEOCHAIR				0.003
				(0.129)
ESGxLNBS				-0.005***
				(0.008)
N		2196	2196	2196

List of Figures

Dataset 2009-2020
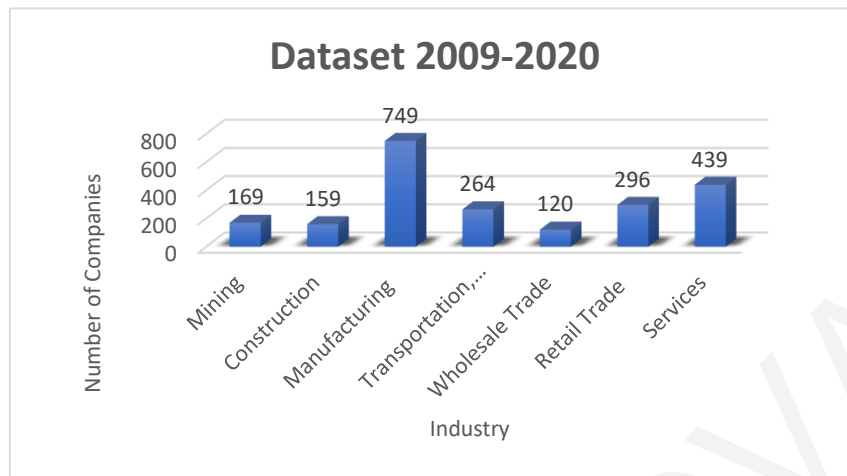
Pillar	Category	Indicators in Rating	Weights
Environmental	Resource Use	20	11%
	Emissions	22	12%
	Innovation	19	11%
Social	Workforce	29	16%
	Human Rights	8	4.50%
	Community	14	8%
	Product Responsibility	12	7%
Governance	Management	34	19%
	Shareholders	12	7%
	CSR Strategy	8	4.50%
TOTAL		178	100%

Source: (Thomson Reuters, 2017)

Figure 3: Heteroscedasticity test

Figure 3A: Scatter plot: ROA
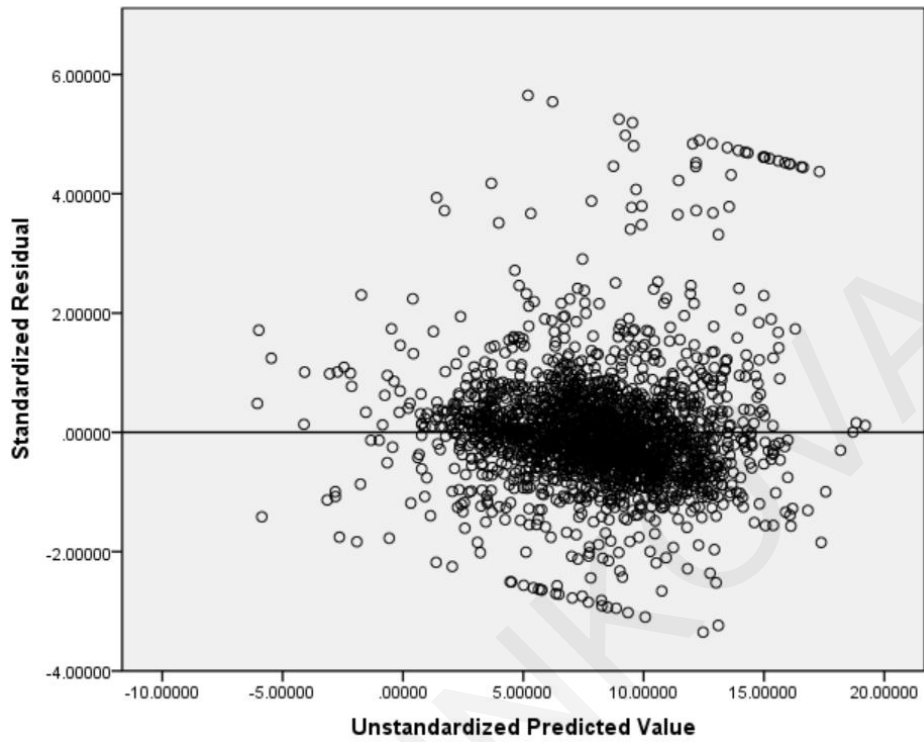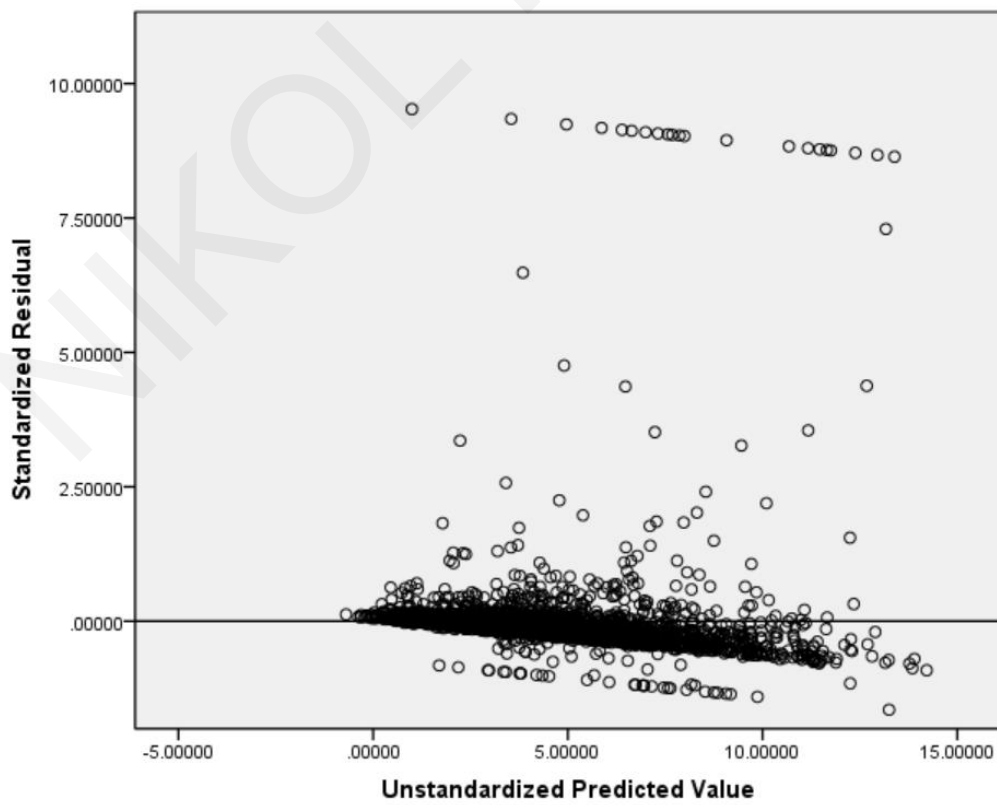

Figure 3B: Scatter plot: MVBV
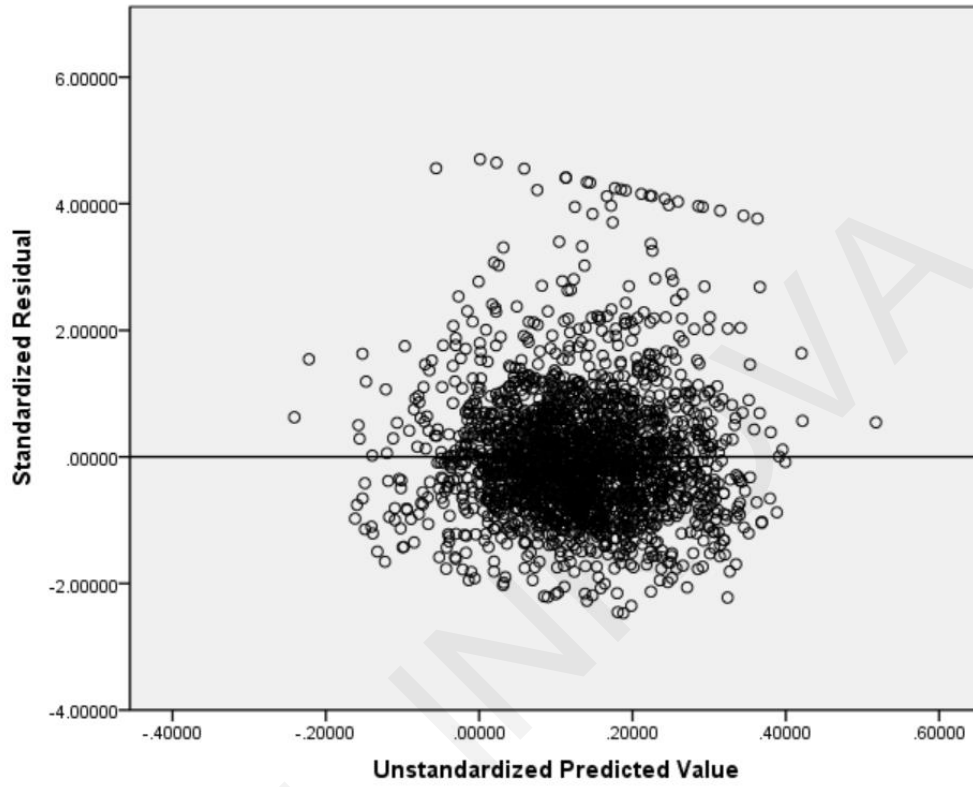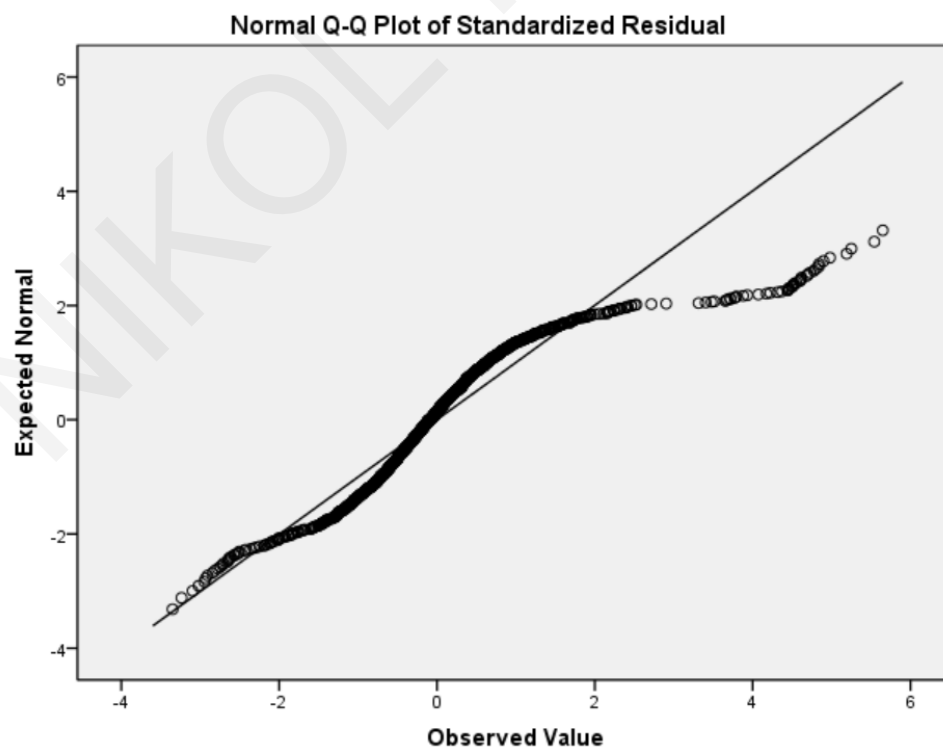
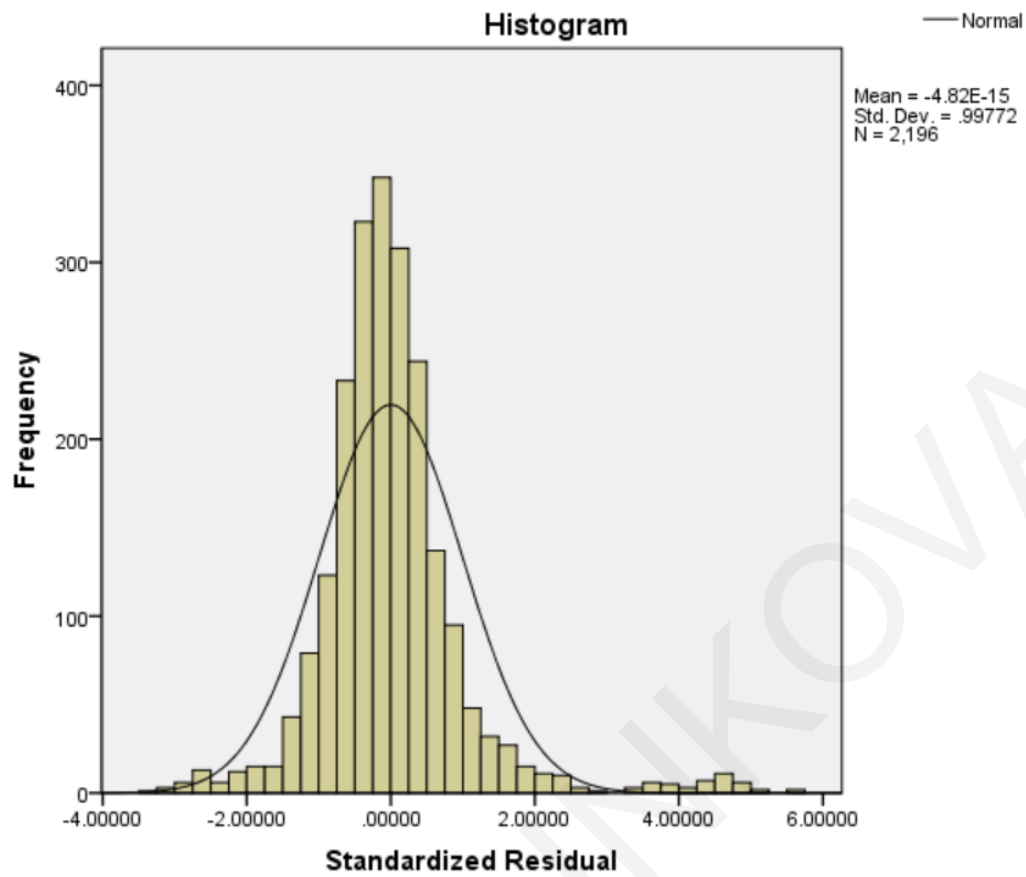*Figure 3C: Scatter plot: STOCKRETURN*
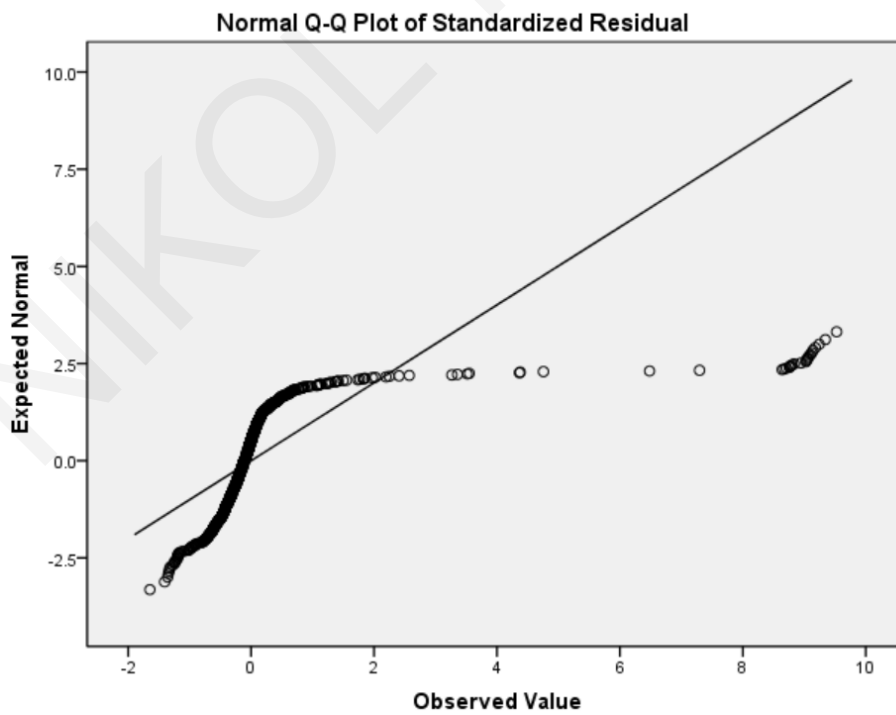
Figure 4: Normality – ROA

Figure 5: Normality – MVBV

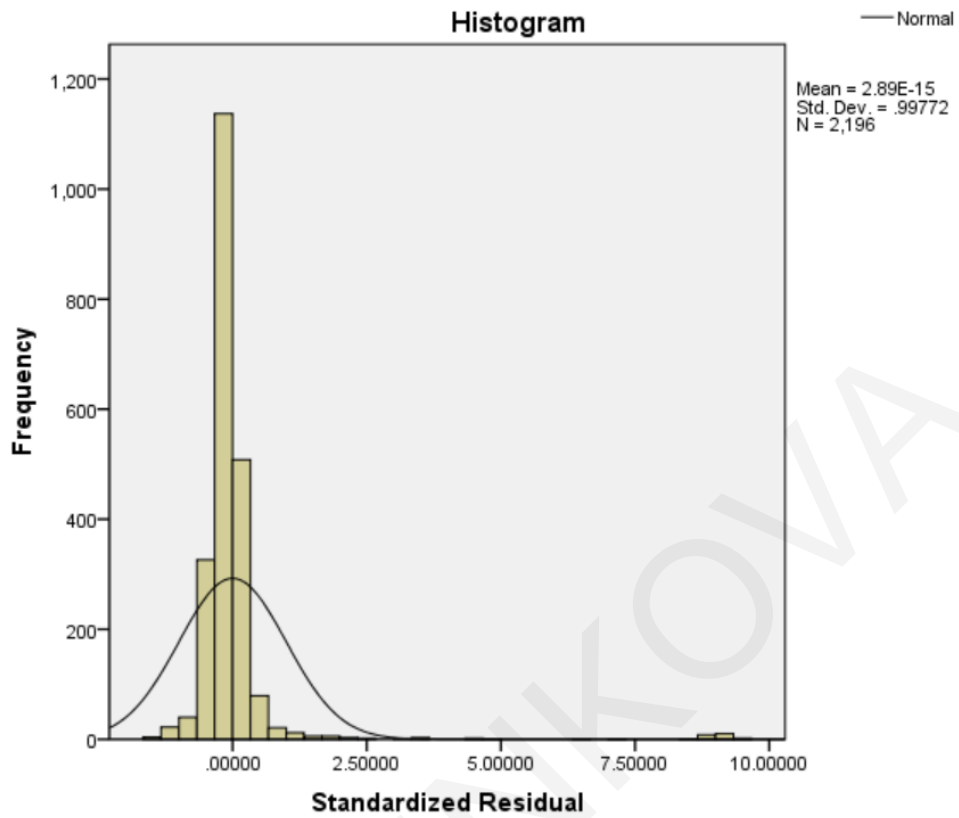Figure 6: Normality – STOCKRETURN
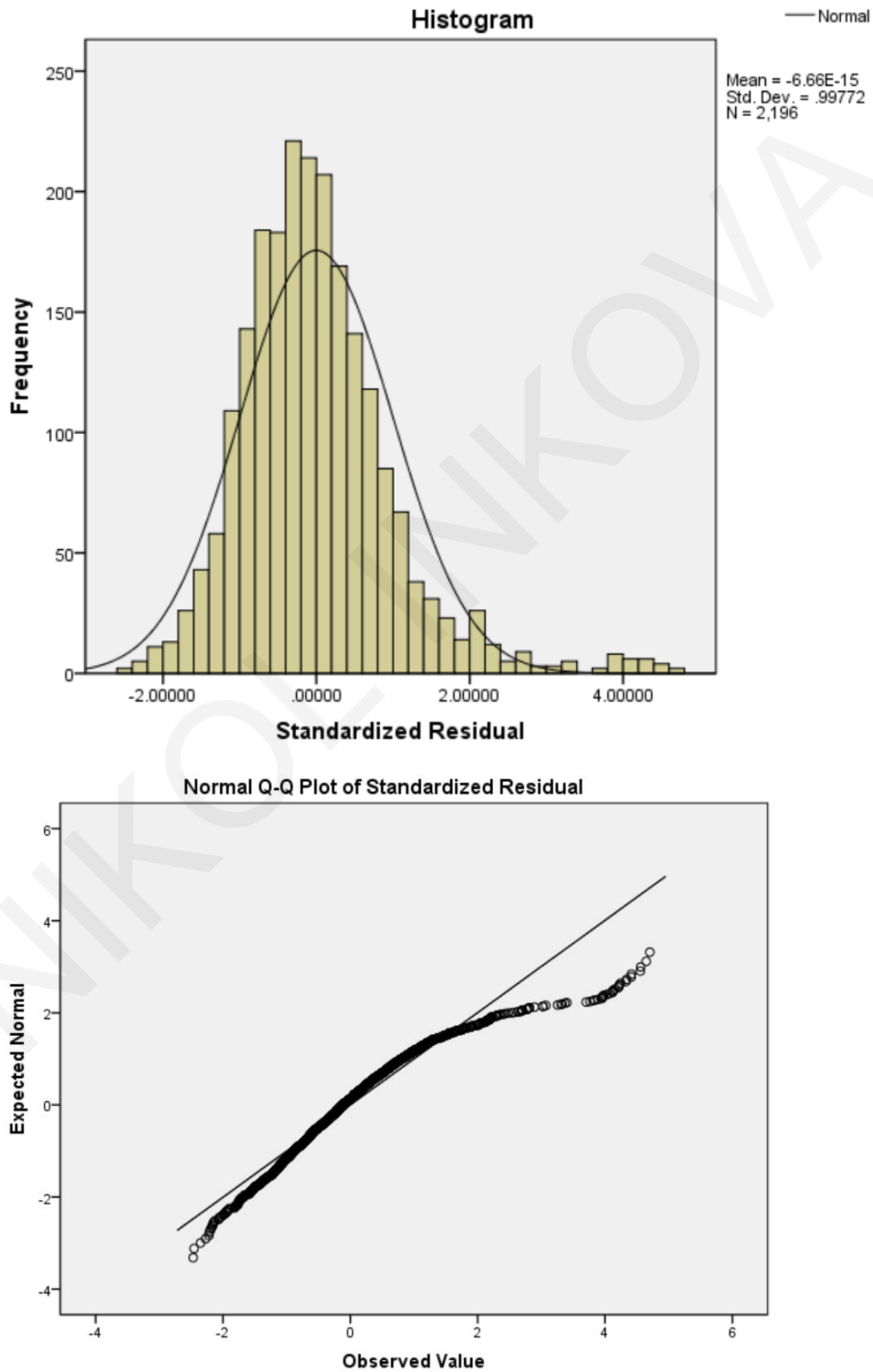
Literature Review

No	Authors	Main aim	Period	Country	Data	Results
1	Changhong Zhao, Yu Guo, Jiahai Yuan, Mengya Wu, Daiyu Li, Yiou Zhou and Jiangang Kang (2018)	Explore the relationship between ESG performance and financial indicators in the energy power market based on the panel regression model	2007 - 2016	China	China's listed power generation groups	The results show that good ESG performance can indeed improve financial performance, which has significant meanings for investors, company management, decision makers, and industry regulators.
2	Alexandra A. Egorova a, Sergei V. Grishunina, Alexander M. Karminsky (2021)	Investigate the impact of ESG factors on the performance of information technology (IT) companies	10 years		IT companies	The paper formulates hypotheses that can be used to test the influence of ESG on the market value of IT companies, developed a model to assess such an influence and provide recommendations for data sample.
3	Reverte, Carmelo; Gómez-Melero, Eduardo; Cegarra-Navarro, Juan Gabriel (2016)	This study uses a structural equation modeling (SEM) approach to empirically test the research model and the relationships in hypothesis and validates them through factor analysis of data coming from 133 companies belonging to the Spanish Social Environmental Agreement.	Spain	Spain	Companies belonging to the Murcia Region (Spain) adhered to the Social Environmental Agreement ('Pacto Social por el Medio Ambiente'),	This study reveals a general support for the mediating role of innovation in the corporate social responsibility-performance relationship.
4	Brammer, S.; Brooks, C.; Pavelin, S. (2006)	This study examines the relation between corporate social performance and stock returns in the UK.	As of July 2002	UK	FTSE All-Share Index	While scores on a composite social performance indicator are negatively related to stock returns, they find the poor financial reward offered by such firms is attributable to their good social performance on the environment and, to a lesser extent, the community aspects. Considerable abnormal returns are available from holding a portfolio of the socially least desirable stocks. These

						relationships between social and financial performance can be rationalized by multi-factor models for explaining the cross-sectional variation in returns, but not by industry effects.
5	Barnett, Michael L.; Salomon, Robert M. (2012)	Building on Barnett's (2007) theoretical argument that a firm's ability to profit from social responsibility depends upon its stakeholder influence capacity (SIC), we bring together contrasting literatures on the relationship between corporate social performance (CSP) and corporate financial performance (CFP) to hypothesize that the CSP-CFP relationship is U- shaped.	1991 - 2006	Publicly-traded firms tracked by Kinder, Lydenberg, and Domini	Publicly- traded firms tracked by Kinder, Lydenberg, and Domini	Results show that firms with low CSP have higher CFP than firms with moderate CSP, but firms with high CSP have the highest CFP.
6	Eva Horváthová (2010)	Examine the heterogeneity in financial environmental performance nexus, empirically carrying out a meta-regression analysis of 64 outcomes from 37 empirical studies to uncover the underlying factors, which can influence the observed variation in the empirical results	December 2008 – February 2009		Scopus, Econlit, Google Scholar, RePEc as well as extensive Internet search and cross-references were examined.	The results suggest both that the empirical method used matters for the nexus and that the likelihood of finding a negative link between environmental and financial performance significantly increases when using simple correlation coefficients instead of more advanced econometric analysis. The results also indicate that the portfolio studies tend to report a negative link between environmental and financial performance.
7	Marcus Wagner (2010)	This paper analyses the link between sustainability management and economic performance.	1992 - 2003	US	Standard & Poor's 500 index as of 31 July 2003	The analysis shows that advertising intensity moderates the association of corporate sustainability performance and economic performance as measured by Tobin's q. For research and development efforts relative to firm size, no moderating role on the link between corporate sustainability and economic performance is

						identified. A sensitivity analysis using separate measures for social and environmental performance reveals that the latter only has a direct effect and the former only a fully moderated effect on economic performance. Policy and management implications of these findings are discussed.
8	Mercedes Rodríguez-Fernández (2016)	Analyzes the relationship between board size and economic-financial performance.	2010-2012	European countries	European firms that constitute the EUROSTOXX50 Index	it is revealed that there exists a strong and negative relation between firm size and financial performance. Consequently, it can be asseverated that the generic recommendation "one size fits all" cannot be applied in this case; which conforms to the Recommendations of the European Union that dissuade using generic models for all countries.
9	Weisheng Lu, K.W. Chau, Hongdi Wang, Wie Pan (2014)	This paper presents a critical review of relevant empirical research articles on the nexus between corporate social performance and corporate financial performance published during the ten-year period from 2002 to 2011.	2002 - 2011	It is a review over existing literature	It is a review over existing literature	The findings show that researchers have gradually recognized that the relationship is not static but changes over time. Furthermore, the paper finds that corporate social responsibility has been increasingly debated in developing countries and in specified industrial settings. The review concludes that to explore the corporate social performance-corporate financial performance nexus by contextualizing it in a specified community, and/or examine its dynamics is a promising research area that can yield significant academic and practical values.
10	Phoebe Koundouri, Nikitas Pittis and Angelos Plataniotis (2022)	Examine empirically whether a relationship between good ESG performance and the good financial condition of companies can be documented.	2019, 2020, 2021	European companies	Sample of the top 50 European companies in terms of ESG performance (STOXX Europe ESG Leaders 50 Index), covering a wide	Results showed that such a connection seems to exist at least for some specific parameters, while for others such a claim cannot be supported.

					range of sectors, namely Automobiles, Consumer, Products, Energy, Financial Services, Manufacturing, etc.	
11	Xiaochen Feng, Alexander Groh, Yin Wang (2020)	Investigate what is the effect of board diversity on CSR performance	1992-2017	USA (All listed companies)	39,960 observations	Significant link between bonus (ex post) compensation schemes and CSR scores. Detect that age and gender diversity affect CSR scores.
12	Shaker A. Zahra (1989)	Examine whether boards of directors influence CSR performance.	Three years preceding data collection (for board variables) CSRP – most recent financi		72 manufacturing companies	The results urge executives and scholars to go beyond composition variables to explain boards' effect on CSRP. The results show that an appropriate mix of directors' characteristics and the development of a sound board decision-making process are also crucial determinants of CSRP.

			al period			
13	Valeria Naciti (2019)	Analyze empirically whether the composition of the Board of directors affects firms' sustainability performance.	2013 – 2016	Fortune Global 500 list, the world's 500 largest entities	362 firms in 46 different industries	Found that firms with more diversity on the board and a separation between chair and CEO roles show higher sustainability performance. Moreover, the findings reveal that a higher number of independent directors leads to lower sustainability performance.
14	Subba Reddy Yarram Sujana Adapa (2021)	To examine the association between gender diversity and positive and negative dimensions of CSR separately.	2011-2016	ASX 300 Index, Australia	214 firms	This study finds evidence supporting both the token theory and the critical mass theory. Both positive and negative dimensions of CSR are unrelated to gender diversity when there is a token female representation on the boards of directors. However, companies that have improved gender balance undertake more positive CSR activities and reduce negative or controversial activities that hinder CSR.
15	Bambang Tjahjadi; Noorlailie Soewarno; Febriani Mustikaningtiyas (2021)	Investigate the effect of good corporate governance on corporate sustainability performance using the Triple Bottom Line approach	2013 - 2017	Indonesia, Indonesia Stock Exchange	117 firms	First, BoC education has a negative effect on economic and environmental sustainability performance and no effect on social sustainability performance. Second, BoC size has a positive effect on economic sustainability performance, a negative effect on social sustainability performance and no effect on environmental sustainability performance. Third, CEO's education has a negative effect on economic sustainability performance, and no effect on environmental and social sustainability performance. Fourth, TMT size has a negative effect on economic and environmental

					sustainability performance and no effect on social sustainability performance.
16	Shihping Kevin Huang (2013)	Explore the relationship between CEO demographic characteristics and consistency in corporate social responsibility performance	2005 - 2010	Major CSR ranking agencies	661 firms with 392 observations	The results indicate that firms' CSR performance, as measured by the consistency of their CSR rankings, is associated with their CEOs' educational specializations in Master's-level business administration (MBA) and science (MSc). In addition, CEO tenure and gender are shown to affect firms' CSR performance. Furthermore, a firm's number of employees also has a significant relationship with its CSR performance.
17	Baraibar-Diez, E., & Odriozola, M. D (2019)	Test whether companies with a CSR committee not only leads to higher economic scores, but also to higher ESG (environmental, social, governance) scores.	2005–2015	Listed firms in Spain, France, Germany, and the UK	197 entities	Results showed that 90% of companies in the sample had a CSR committee in 2014, and that those companies had significantly different ESG scores than those without a CSR committee.
18	Y.T. Mak, Yuanto Kusnadi (2005)	Examines the impact of corporate governance mechanisms of Singapore and Malaysian firms on the Tobin's Q of these firms	1999/2000	Singapore Stock Exchange and Kuala Lumpur Stock Exchange	271 firms - Singapore Stock Exchange; 279 firms - Kuala Lumpur Stock Exchange	There is an inverse relationship between board size and Tobin's Q in both countries. This suggests that the negative relationship between board size and firm value transcends different corporate governance systems.

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19	Naciti (2019)	The purpose of this study Is to investigate the effect of the main Corporate governance characteristics on the corporate environmental performance	2017	Thomson Reuters global food and beverages price return index	174 food companies	The results revealed that the size of the BoD and the presence of women directors on board have a positive effect on environmental performance.
20	Amama Shaukat; Yan Qiu, Grzegorz Trojanowski (2016)	In this paper the authors draw on insights from theories in the management and corporate governance literature to develop a theoretical model that makes explicit the links between a firm's corporate social responsibility (CSR) related board attributes, its board CSR strategy, and its environmental and social performance. Moreover, they test the model using structural equation modeling approach.	2002-2010	UK listed companies	2028 firm-year observations	The greater the CSR orientation of the board (as measured by the board's independence, gender diversity, and financial expertise on audit committee), the more proactive and comprehensive the firm's CSR strategy, and the higher its environmental and social performance
21	Patrick Veltel Martin Stawinoga (2020)	This paper aims to convey a detailed understanding of sustainable management control's impact as CSR-related board expertise. In more detail,				Analysis shows that CSR committees positively infuence CSR reporting and performance.

		the authors focused on the infuence of both CSR committees and CSOs on three CSR measures mainly analysed in empirical-quantitative research: (1) CSR reporting; (2) CSR assurance (CSRA); and (3) CSR performance.			
22	Griffin & Mahon (1997)	This article extends earlier research concerning the relationship between corporate social performance and corporate financial performance, with particular emphasis on methodological inconsistencies			Better ESG performance leads to higher market valuations
23	Auer & Schuhmacher (2016)	analyse the performance of socially (ir)responsible investments in three markets, namely Asia-Pacific region, the United States and Europe.		Asia-Pacific region, the United States and Europe	They have discovered that in the Asia-Pacific region and the United States, a socially-responsible investment influence is not for a specified industry. Moreover, they found that in Europe, there is no sign of a significant result for the positive influence of ESG on financial performance