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**Master Thesis U.S.E.**

The Impact of Environmental, Social, and Governance (ESG) Factors on Corporate Financial Performance: Exploring the moderating role of Board Characteristics<sup>1</sup>

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**Abstract**

This paper examines the relationship between Environmental, Social, and Governance (ESG) factors and company performance, with a focus on the moderating role of board characteristics. Utilizing panel data analysis, the study investigates 429 companies of EUROSTOXX 600 from 2012 to 2022. The financial performance measures, Return on Assets (ROA) and Tobin's q, are employed to gauge company performance. The findings reveal a significant and negative relationship between ESG and its components (E, S, G) with both financial performance measures, suggesting potential trade-offs between social and environmental responsibility and financial outcomes. Furthermore, the study explores the moderating effects of board characteristics, finding that board gender diversity exhibits a significant and negative association with Tobin's q, while board independence shows no significant impact on financial performance. The limitations of the study include the limited generalizability to other regions, the focus on financial performance measures alone, and the potential for unobserved variables. Nonetheless, this research contributes to the understanding of the interplay between ESG, board characteristics, and company performance, informing stakeholders about the importance of balancing sustainability efforts and financial outcomes in corporate decision-making.

**Keywords:** financial performance, ESG score, board size, board independence, board gender diversity, corporate governance

**JEL-codes:** L25, M14, Q51

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## Introduction

Examining the relationship between ESG concerns and corporate performance is an essential topic, especially in today's social environment where sustainable and responsible investment is becoming increasingly relevant. This relationship has captured the attention of investors, policymakers, and academics. Numerous empirical studies have examined whether incorporating the ESG concept into a company's fundamental operations benefited shareholders, increased profitability, and/or raised its valuation. Results remain ambiguous, inconclusive, and sometimes contradictory. The findings are still unclear, speculative, and occasionally contradictory.

ESG factors are non-financial aspects of a company's operations, such as its environmental impact, treatment of employees and communities, and corporate governance practices. As concerns about sustainability and corporate social responsibility grow, it is critical to understand the potential financial implications of these factors for businesses and investors. Furthermore, the current energy crisis emphasizes the importance of understanding the financial risks and opportunities associated with sustainable business practices as society and economies transition to a low-carbon future.

To assess the potential financial benefits of implementing sustainable business practices, this paper will investigate the relationship between a company's ESG performance and its corporate financial performance. The ESG-CFP question was thoroughly examined, but many of its crucial components were not adequately addressed in the literature at the time. In particular, not only was it insufficient to include companies from poor nations in the sample (Naimy & Bou Zeidan, 2019; Nyeadu et al., 2018), but the corresponding findings were also conflicting and not clear (Güler et al., 2010; Zhao et al., 2018). Moreover, the corporate governance component was frequently ignored (Galbreath, 2013), and only the impact of an organization's overall ESG score on its CFP was discussed while neglecting the pillar levels. Although ESG features might greatly differ throughout businesses, there is another fundamental flaw when results are generalized based on multiple industries considered all at once (Soana, 2011).

There may still be a void in the literature regarding the potential moderating effects of other factors, like gender diversity or board independence, on this relationship. This is an essential gap to narrow since it can reveal how much board independence and gender diversity affect the association between ESG criteria and business performance. In recent years, there has been an increase in research on how gender diversity influences corporate performance. Similarly, research has shown that firms with more independent boards outperform their competitors. However, it is unclear how these variables may combine with ESG variables to influence company success.

In terms of gender diversity, Adams and Ferreira (2009) conducted research on the association between gender diversity on boards and corporate performance. They discovered that organizations with a higher ratio of female directors performed better financially, as assessed by return on assets (ROA) and return on equity (ROE). Furthermore, the study discovered evidence that the favorable association between gender diversity and company performance was stronger in

organizations that performed well in terms of corporate social responsibility (CSR). This implies that gender diversity and CSR may have a mutually beneficial influence on corporate performance.

In the context of board independence, Kiel and Nicholson (2003) conducted research on the relationship between board independence and firm performance. They discovered that companies with a higher percentage of independent directors on their boards performed better financially, as assessed by return on assets (ROA) and return on sales (ROS). Furthermore, they discovered evidence of a beneficial moderating effect of board independence on the association between CSP and financial performance. This implies that increased board independence may boost the positive association between CSP and financial performance. Taken together, these studies provide evidence that both gender diversity and board independence can have positive mitigating effects on the relationship between ESG factors and firm performance. It suggests that companies that prioritize issues and have diverse and independent boards may be better positioned to perform financially.

This study will try to fill the gap in the literature by examining how ESG factors can affect CFP while measuring and analyzing separately the impact of the three ESG components - environmental, social, and governance - on the CFP and providing empirical evidence for European firms listed on the STOXX 600 index, operating for the period of 2012 to 2022, while integrating accounting and market-based data. Furthermore, the moderating impacts of gender diversity and board independence will provide us with a deeper understanding of that relationship and its underlying causes.

The purpose of this research is to enhance our understanding of the financial implications of Environmental, Social, and Governance (ESG) factors for companies and investors, while also contributing to the ongoing discourse surrounding the role of ESG in financial markets. The combination of ESG factors, board characteristics, and company performance holds significant relevance for governments, investors, and society as a whole. Regulatory bodies and governments can leverage the research findings to develop effective regulations that promote sustainable practices and responsible governance within corporate entities. Investors, on the other hand, can benefit from the insights gained by comprehending the effects of ESG factors on company performance and considering the influence of board characteristics in their investment decision-making processes. Furthermore, society at large stands to gain from the adoption of sustainable and socially responsible practices, including reduced environmental impact and improved working conditions. Ultimately, this research contributes to fostering a more inclusive and sustainable business environment that prioritizes the interests of various stakeholders.

The rest of this thesis is structured as follows: To begin, the primary theoretical explanatory approach to the economic relevance of sustainable management, ESG, and financial outcomes will be discussed, as well as the theoretical framework for the potential moderating effect that gender diversity and board independence may have on the ESG-CFP relationship. This will serve as the foundation for our hypotheses. The empirical data and methodology will then imply sample selection, primary variables, and the regression model. Following that, the research findings from correlation and regression analysis are highlighted. Finally, the study's findings and limitations will be discussed.

## Literature review and Theoretical Framework

### *ESG*

Recent years have seen a rise in interest in environmental, social, and governance (ESG) issues as stakeholders and investors call for businesses to operate in a more ethical and sustainable manner. As it has significant consequences for investment choices and business strategy, there is increased interest in understanding the relationship between ESG performance and corporate financial performance. More than 2,000 empirical research have been carried out to examine the connection between CSR and CFP since the middle of the 20th century, and this number is on the rise (Friede et al., 2015). In major public companies, there is conflicting empirical data about the relationship between financial and environmental performance (Molina-Azorin et al. 2009; Montabon, Sroufe, and Narasimhan 2007; Wahba 2008). This review of the literature seeks to give a thorough overview of the studies that have been done on the connection between ESG and corporate financial performance.

A positive correlation between ESG performance and financial performance has been found in numerous research. For instance, Eccles and Serafeim's (2013) meta-analysis revealed that businesses with excellent ESG performance outperformed those with weak ESG performance, in terms of financial performance. Another study by Gompers et al. (2016) indicated that companies with high ESG ratings had a lower cost of capital and were more likely to have higher profitability and higher market valuations. ESG disclosure has a positive impact on business financial performance, according to Chen, Z., & Xie's (2022) study for non-financial Chinese enterprises over the years 2000-2020. From this approach, they come to two findings. One is that ESG investors are attracted by ESG disclosure. Another is that the relationship between ESG ratings and financial performance is positively moderated by ESG investors.

Velde et al. (2005) countered this claim by stating that high sustainability-based companies had better CFP than low-rated ones. In the United States, the Asia-Pacific region, and Europe, Auer et al. (2016) investigated the relationship between ESG and speculator interactions. According to the study, investing in companies with greater EGS disclosures could result in investors receiving reasonably decent returns. Using extensive longitudinal data from the largest polluting businesses in the United States, Clarkson et al. (2011) investigate the causes and effects of proactive environmental policies. Their research confirms that adopting pro-active environmental measures enhances financial performance. According to Chelawat et al. (2016), companies with stronger ESG performance also have favourable CFP. Most significantly, Fatemi et al. (2017) also investigated how ESG impacts firm valuation. The corporate value and the sustainability exposures were closely related.

In contrary, Duque-Grisales and Aguilera-Caracuel (2019) investigated if a firm's financial performance (FP) is connected with higher environmental, social, and governance (ESG) scores in Latin American emerging markets of multinationals. The findings indicated that the association between the ESG score, and CFP was statistically significant and negative. Furthermore, when environmental, social, and governance variables were examined separately to evaluate each

variable's relationship to multinationals' financial performance, the results revealed a negative relationship. Also, in their research, Singh, Singh, and Shome (2022) attempted to discover and empirically examine the antecedents that affect the relationship between an organization's ESG disclosures and its corporate financial performance (CFP). The ESG-CFP association was determined by the study using a sample of BSE-200 companies and the multiple regression technique. The findings indicate a negative connection between ESG and CFP.

Other studies, on the other hand, have shown inconsistent or inconclusive results. Friede et al. (2015), for example, discovered a mixed picture of the relationship between ESG and financial success, with certain categories, such as energy and utilities, exhibiting a positive association while others, such as healthcare and technology, showed a negative correlation. Similarly, Khan and Serafeim (2016) discovered that, depending on the industry and the type of ESG component considered, the relationship between ESG and financial performance was positive for certain organizations but negative for others. Furthermore, Horváthová (2010) revealed that half of the studies on the relationship between environmental CSR and CFP found a positive association, while the other half found either a negative or insignificant impact.

The fact that the connection between ESG and financial performance may be more nuanced than previously believed is one explanation for the inconsistent results. According to some academics, the relationship might be moderated by other elements like stakeholder engagement, risk management, and corporate governance. For instance, a study by Oikonomou et al. (2014) discovered that organizations with superior governance systems had a stronger positive association between ESG and financial success. According to Crifo et al. (2019), effective ESG disclosures reduce the yield spread on government securities. According to certain studies (Kiernan 2007; Seeger and Hipfel 2007), sustainability activities may lead to an increase in financial risk and uncertainty. Also, according to Walley and Whitehead (1994), practicing environmental responsibility is difficult and expensive.

The possibility of bias or mistake in the measuring of ESG and financial success is another rationale for the inconsistent outcomes. Better and more consistent metrics for both financial performance and ESG performance are required, according to numerous research. For instance, a study by Kotsantonis et al. (2016) discovered that the type of ESG component taken into account as well as the ESG rating agency chosen could have a big impact on the analysis's outcomes.

Overall, the research points to a link between ESG and financial performance, however this link may be more nuanced and context-dependent than previously believed. There is a need for greater research that takes into account the mediating elements, the various aspects of ESG success, and better, more consistent metrics for comparing ESG and financial performance. The findings imply that a focus on ESG aspects may improve financial performance and long-term sustainability for businesses, which has significant consequences for investors and stakeholders.

According to the discussion above, ESG disclosures generally have a positive effect on CFP, which leads to the following first hypothesis:

***H1. There is a positive relationship between ESG score and CFP.***

## ***Environmental, Social, and Governance***

The performance of a company's environmental, social, and governance (ESG) sub-factors determines its ESG score. The impact of each subfactor on company financial performance has attracted attention in the literature. Both at the national and international levels, ESG reporting is still in its development (Giannarakis et al., 2014). Statman and Glushkov (2009), Galema et al. (2008), and Friede et al. (2015) remark that a variety of criteria, each of which may have a unique relationship with and impact on FP, contribute to the ESG score.

According to Velde et al. (2005), companies with a high sustainability rating have better CFP than stocks with a low rating. In the United States, the Asia-Pacific region, and Europe, Auer et al. (2016) investigated the relationship between ESG and speculator interactions. According to the study, investing in companies with greater EGS disclosures could result in investors receiving reasonably decent returns. According to Chelawat et al. (2016), companies with stronger ESG performance also have favorable CFP. Most significantly, Fatemi et al. (2017) also looked into how ESG impacts firm valuation.

Salama (2005) depicted a positive relationship between environmental performance and CFP with a similar frame of mind. Murphy (2002) and Gozali et al. (2002) made similar claims that CFP is positively influenced by environmental performance. 52 research papers from the past 35 years were analyzed by Albertini (2013). This study discovered a beneficial correlation between social performance and CFP.

According to previous research (Bihari and Pradhan, 2011; Uadiale and Fagbemi, 2012; Singh, 2014, and Fernandez, 2016), there is a favorable relationship between corporate social performance and corporate financial performance. A framework was presented by Perrini et al. (2011) to help businesses and stakeholders better understand CSR and the governance structure. Further. The study discovered a correlation between CFP and CSR. Fernandez (2016) also looked into 107 Spanish companies for the year 2009, in addition. The study showed a strong correlation between the two: social good is profitable, and profitable good is social. Being socially responsible by businesses increases earnings, according to a favorable association (Lee & Choi, 2021; Shahzad et al., 2022).

To sum up, while some authors (Limkriangkrai et al. 2017) claim that the global score can be used for research purposes, others (Humphrey et al. 2012) suggest using the individualized score for each dimension because of things like institutional conditions, country of origin conditions, and pressures from various stakeholders, among other things. Examining the connection between the effects of the E, S, and G sub-factors on CFP is crucial for this reason.

These claims lead to the following hypotheses being suggested as parts of H1:

***H1a. There is a positive relationship between environmental score and CFP.***

***H1b. There is a positive relationship between social score and CFP.***

***H1c. There is a positive relationship between corporate governance score and CFP.***

### ***Board Gender Diversity***

The body of knowledge regarding the relationship between (ESG) initiatives and business performance is growing. The impact of other variables on the link between ESG and CFP is a topic of research.

The moderating impact of gender diversity on the link between ESG and firm performance is a more recent area of investigation. Several studies have looked into this connection, and some have shown that adding more women to top management teams can strengthen the link between ESG and performance.

It is very acceptable to inquire about the impact of the gender diversity of the board of directors on its functioning and, consequently, on the performance of the company, given the close relationship between the board's operation and that of the firm. Many, inconsistent, and non-conclusive studies have been conducted on the subject of the connection between gender diversity and CFP.

Despite the fact that the body of research on the moderating role of gender diversity in the relationship between ESG and corporate performance is still in its infancy, it generally supports the idea that greater gender diversity may strengthen the positive correlation between ESG and performance. To completely comprehend this association and the underlying mechanisms causing it, more study is necessary.

A growing body of research acknowledges that the gender diversity of the board may influence disclosure decisions made by the board, particularly ESG disclosure (Garca-Sánchez et al., 2020; Hoang et al., 2018; Tejedo-Romero et al., 2017). (Katmon et al., 2019).

For instance, a 2019 study by Renneboog et al. identified a stronger correlation between ESG scores and financial performance in companies with higher gender diversity. In a similar vein, Li et al. 2020 's research discovered that companies with more women in top management teams were more willing to invest in ESG practices, which in turn enhanced their financial success.

Female executives' leadership styles and organizational strategies differ from those of their male coworkers (Glass et al., 2016). Female board members are typically more concerned with environmental and social welfare, whereas male board members are more concerned with profit maximization (Arayssi, 2020), despite the fact that women continue to be underrepresented on corporate boards (Catalyst, 2020).

However, other studies have produced contradictory results. The correlation between ESG and business performance, for instance, was negatively moderated by gender diversity, according to a study from 2020 by Beck and Szilagyi. This finding suggests that other factors, such as board independence, may have more of an impact on this relationship's moderators. Previous studies have discovered that BGD and CSR/ESG performance have positive as well as negative consequences (Kyaw et al., 2017; Nadeem et al., 2017; Cucari et al., 2018; Manita et al., 2018; Shahbaz et al., 2020).



On the basis of the theoretical framework described above, this research aims to test if the Gender Diversity on BoD moderates the relationship between ESG and CFP performance. Therefore, the following hypothesis is posited:

***H2: The women's representation on the board moderates the relationship between ESG and CFP.***

### ***Board Independence***

Studies have shown that certain factors, such as board independence, may be able to reduce the relationship between ESG and business performance. The term "board independence" refers to the number of independent or outside directors, as well as other board members, that make up the board of directors. Independent boards may be more effective in monitoring management and enforcing ESG regulations, according to study.

Board independence is the percentage of independent directors who are not connected to the company on the board of directors, such as outside directors or non-executive directors. Since independent directors are thought to provide objective scrutiny of management and can help minimize conflicts of interest, board independence is seen as a key tool for ensuring good corporate governance.

According to research done in 2009 by Luo & Bhattacharya, companies with a higher percentage of independent directors have a stronger positive correlation between corporate social performance—which includes ESG practices—and financial performance.

Board independence moderates the association between corporate social performance (which includes ESG practices) and financial performance, according to a 2012 study by Ioannou and Serafim et al. Particularly, in businesses with a higher percentage of independent directors, there is a stronger correlation between corporate social performance and financial performance.

According to a 2015 study by Jiang, Liu, and Xu, board independence moderates the association between corporate social responsibility (including ESG practices) and financial performance. When there is a bigger share of independent directors on the board, the beneficial association becomes stronger.

In addition, according to a 2016 study by Lee, Park, and Lee, board independence moderates the relationship between corporate social responsibility and financial performance, however the direction of the effect depends on the financial performance metric used. When return on assets (ROA) is used as the performance indicator, board independence reduces the correlation between corporate social responsibility and financial performance. Tobin's Q, a gauge of market value, and board independence do, however, have a positive correlation.

According to these studies, board independence may be able to moderate the association between ESG practices and financial success, and the direction and degree of the moderating effect may vary depending on the precise metrics employed.

Based on the theoretical framework outlined above, the purpose of this study is to determine whether or not the Board Independence affects the relationship between ESG and CFP performance. Consequently, the following hypothesis is formulated:

***H3: Board Independence moderates the relationship between ESG and CFP.***

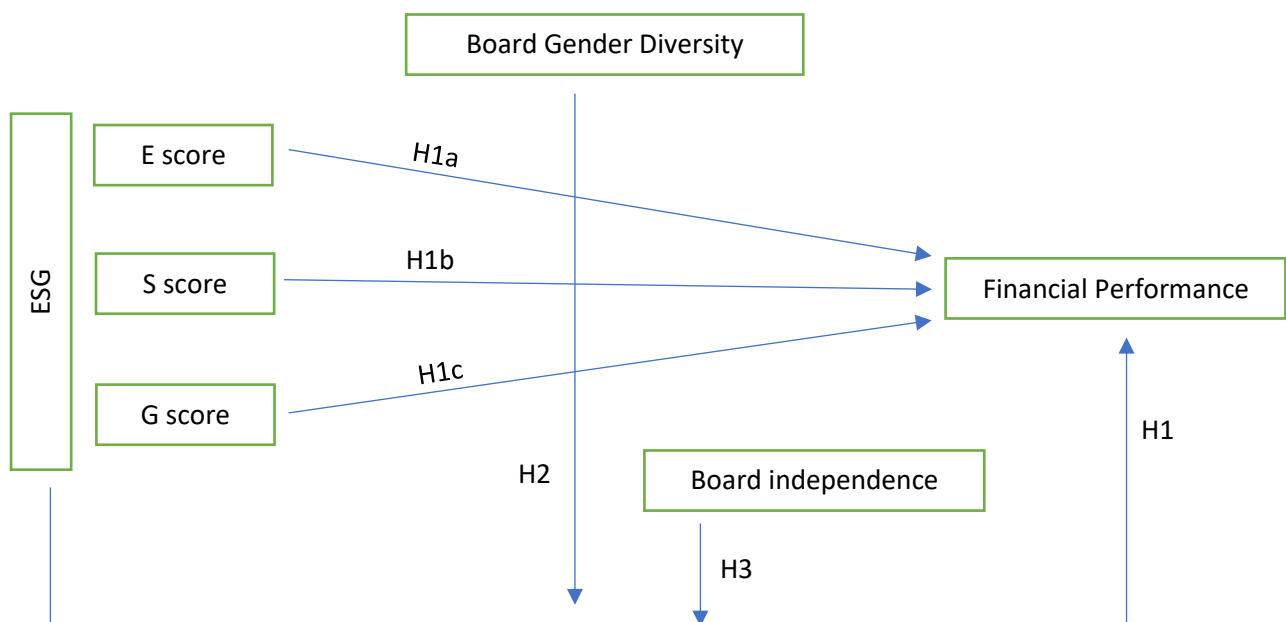
## Methodology and Empirical Strategy

### Data Collection and Description

#### Sample

For this analysis, the STOXX Europe 600 index has been considered for the period 2011–2021. With a set number of 600 components, this index covers around 90% of the free-float market capitalization of the European stock market (not only the Eurozone) and includes large, medium, and small capitalization companies from 17 different European nations. The United Kingdom, which makes up roughly 22.3% of the index, France, which makes up roughly 16.6% of the index, Switzerland, which makes up roughly 14.9% of the index, and Germany, which makes up roughly 14.1% of the index, along with Australia, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, and Sweden, are the other nations that make up the index. The STOXX 600 index, which offers a thorough overview of the European stock market, is commonly used in academic literature (Bahmani-Oskooee & Harvey, 2018; Karagiannis, Fassas & Drivas, 2018; Kalev & Sarstedt, 2010). So, I will have a complete sample of different enterprises and nations throughout Europe. Financial corporations will not be included in our sample because they follow various regulations for their financial reporting and different accounting standards. As a result, the sample consists of 429 businesses and 4719 observations.

Figure 1. Research models



### ***Dependent variable***

In accordance with current literature, I decided to incorporate both accounting (ROA)(El Khoury & Naimy & Iskandar, 2021; Amosh & SKhatib & Ananzeh, 2022; Brahmana and Kontesa, 2021; Hart and Ahuja, 1996; Russo and Fouts, 1997; Shen and Chang, 2009) and market-based measures (Tobin's Q) (Choi and Wang, 2009; McGuire et al., 1988; Nelling & Webb, 2009; Velte, 2017). Accounting measures are sensitive to firm-specific risk, whereas market measures are sensitive to systematic risk (McGuire et al., 1988). In order to produce a comprehensive summary of the hypothesized relationships with ESG, I chose to use both types of CFP measures. ROA is chosen as accounting measure, while Tobin's q is chosen as market measure.

### ***Independent variables***

According to Galbreath (2013) and Saltaji (2013), the interdependence of corporate governance, corporate social responsibility, and financial performance (CFP) necessitates their concurrent study. CSR and corporate governance dimensions are both included in the Environmental, Social, and Governance (ESG) elements that are used as a variable in this context. Prior research suggests using one-year lagged ESG variables (ESG t-1) to assess the impact of ESG on CFP, as shown by Graves and Waddock (1994) and McWilliams and Siegel (2001). Given that ESG does not immediately affect financial performance, as shown by Scholtens (2008), it is essential to include temporal lags of at least one year in regression modeling. Furthermore, an individual study of each component is used to determine the principal contributor among the three ESG components to CFP, namely the Environmental score (ENVt-1), Social score (SOCt-1), and Governance score (GOVt-1). The quantity of lags that should be employed will be determined in the subsequent stages of this paper using an optimal lag selection test.

### ***Control Variables***

The performance of a company may be considerably impacted by its size. The ability to access more resources and the desire to perform better and reveal more may be stronger for larger organizations (e.g., Brammer and Pavelin 2006; King and Lenox 2001; Waddock and Graves 1997). As a result, I anticipate that firm size and financial success will be positively correlated.

The natural logarithm of a firm's total assets is used as a proxy for its size (Demsetz & Lehn, 1985; Gulati, 1995; Hackston and Milne, 1996; McWilliams & Siegel, 2001; Black et al., 2006; El Ghouli, Guedhami, Kwok & Mishra, 2011; Ioannou & Serafeim, 2012; Bennouri & Chtioui, Nagati & Nekhili, 2018; Jiang & Chen & Rughoo & Zhou, 2022).

The monitoring demand for information will increase if firms' levels of leverage increase (Clarkson et al. 2008, 2011; de Villiers, Naiker, and van Staden 2011; King and Lenox 2002; Waddock and Graves 1997), which is consistent with prior research suggesting that financial risk (leverage) contributes to firm performance. According to Bennouri, Chtioui, Nagati, and Nekhili (2018) and Jiang, Du, and Chen (2022), leverage represents the total debt divided by the total assets.

Incorporate governance-related variables such as board independence, board gender diversity, and board size into governance indicators. These variables can provide insight into the firm's corporate governance processes, which may affect the company's financial performance. Higher board gender diversity is associated with better corporate governance practices and improved firm performance (Adams & Ferreira, 2009). Better governance practices, such as board independence and board size, are associated with higher firm valuations (Gompers, Ishii, Metrick, 2003; Kiel & Nickolson, 2003).

### *Moderating variables*

Board Gender Diversity (G\_DIV) measures the proportion of women on a company's board. (Refinitiv Eikon Datastream). The proportion of women on a company board has also been used as a proxy for board gender diversity in earlier studies. (Galbreath, 2018; Shakil et al., 2020).

Board Independence (B\_IND) is the number of independent directors to total number of board members.

All the dependent, independent and control variables together with their definitions and acronyms on ESG are depicted in Table 1.

<b>Variables</b>	<b>Definition-Measurement</b>	<b>Source</b>
<b>Dependent Variables</b>		
Tobin's q	Market capitalization plus liabilities divided by total assets	Eikon Refinitiv database
ROA	Return on Assets at time t of company i is defined as Net Income divided by Average Total Assets	Eikon Refinitiv database
<b>Independent Variables</b>		
ESG	Overall ESG score. It ranges from 0-100 where a higher value indicates a higher ESG score.	Eikon Refinitiv database
ENV	Environmental score. This pillar is derived from a predetermined weighted score on indicators related to: (i) emission, (ii) innovation, and (iii) resource use	Eikon Refinitiv database
SOC	Social score. This pillar is derived from a predetermined weighted score on indicators related to: (i) workforce, (ii) human rights, (iii) community, (iiii) product responsibility	Eikon Refinitiv database

GOV	Governance score. This pillar is derived from a predetermined weighted score on indicators related to: (i) management (ii) shareholders (iii) CSR strategy.	Eikon Refinitiv database
<b>Control Variables</b>		
SIZE	Natural logarithm of Total Assets at time t-1 of company I (firm size)	Eikon Refinitiv database
LEV	Total Debt divided by Total Assets at time t-1 of company i	Eikon Refinitiv database
B_SIZE	Board size	Eikon Refinitiv database
B_IND	Board independence. (Percentage of independent directors on the board)	Eikon Refinitiv database
G_DIV	Board Gender Diversity	Eikon Refinitiv database
<b>Moderating Variables</b>		
B_IND*ESG	Board independence * ESG	Eikon Refinitiv database
G_DIV*ESG	Board Gender Diversity *ESG	Eikon Refinitiv database

Table 1. Summary of the variables

## Data Analysis

In the present study, a panel data sample is utilized, and the application of the Hausman test is proposed to determine the appropriate selection between a fixed effects model and a random effects model. In order to examine the research hypotheses, both the fixed effects and random effects models were employed, and subsequently, the Hausman test was conducted to ascertain the more suitable choice. Hence, the regression models are formulated as follows:

$$\text{Model 1a: } RO_{Ai,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \epsilon_{i,t}$$

$$\text{Model 2a: } RO_{Ai,t} = \beta_0 + \beta_1 ENV_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \epsilon_{i,t}$$

$$\text{Model 3a: } RO_{Ai,t} = \beta_0 + \beta_1 SOC_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \epsilon_{i,t}$$

$$\text{Model 4a: } RO_{Ai,t} = \beta_0 + \beta_1 GOV_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \epsilon_{i,t}$$

**Model 5a:**  $ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 G\_DIV_{i,t-2} + \beta_3 (ESG * G\_DIV)_{i,t-2} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 B\_SIZE_{i,t-2} + \beta_7 B\_IND_{i,t-2} + \varepsilon_{i,t}$

**Model 6a:**  $ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 B\_IND_{i,t-2} + \beta_3 (ESG * B\_IND)_{i,t-2} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 B\_SIZE_{i,t-2} + \beta_7 G\_DIV_{i,t-2}$

**Model 1b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \varepsilon_{i,t}$

**Model 2b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 ENV_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \varepsilon_{i,t}$

**Model 3b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 SOC_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 BI_{i,t-2} + \beta_5 BGD_{i,t-2} + \beta_6 BS_{i,t-2} + \varepsilon_{i,t}$

**Model 4b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 GOV_{i,t-2} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 B\_IND_{i,t-2} + \beta_5 G\_DIV_{i,t-2} + \beta_6 B\_SIZE_{i,t-2} + \varepsilon_{i,t}$

**Model 5b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 G\_DIV_{i,t-2} + \beta_3 (ESG * G\_DIV)_{i,t-2} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 B\_SIZE_{i,t-2} + \beta_7 B\_IND_{i,t-2} + \varepsilon_{i,t}$

**Model 6b:** Tobin's  $Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t-2} + \beta_2 B\_IND_{i,t-2} + \beta_3 (ESG * B\_IND)_{i,t-2} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 B\_SIZE_{i,t-2} + \beta_7 G\_DIV_{i,t-2}$

Where  $i$  represents the company ( $i=1...600$ ),  $t$  is the year in the time frame ( $t=2012...2022$ ) and  $\varepsilon$  is the error term.

## Results and Interpretation

The dependent variable Tobin's Q is noticed to follow a Poisson distribution, so to address that issue I will use in our research the natural logarithm of Tobin's q. Using the natural logarithm can be particularly useful when the dependent variable has a skewed distribution. By taking the logarithm, we can often achieve a more symmetric distribution and linearize the relationship between variables (Fox, 2015; Hair, Black, Babin, & Anderson, 2019).

Multicollinearity is a critical issue that arises when predictor variables are highly correlated. Brooks (2019) suggests using a correlation matrix to assess the multicollinearity of independent variables (value > 0.8). For each regression model, the collinearity tolerance and variance inflation factor (VIF) are used to assess for collinearity. According to Gujarati (2004), VIF levels below 10 are generally considered acceptable bounds for assessing multicollinearity. In our regression models, the VIF levels of each variable are well below this threshold, indicating the absence of significant multicollinearity among the independent variables. Tables 3 and 4 contain the VIF values for each regression model.

The Durbin-Watson (DW) statistics are commonly observed to range between 1.5 and 2.5, indicating the absence of autocorrelation within the residuals (Brooks, 2019). In our study, both equations yielded DW statistics falling within the range of 1.5 to 1.7 (Appendix 1). Consequently, none of the regression equations exhibited significant issues with multicollinearity or autocorrelation.

When computing regression models, it is essential to include time lags of at least one year between ESG and financial performance because ESG will not have an immediate impact on financial performance (Scholtens, 2008). The optimal lag selection test, also known as lag order selection, is a statistical process for determining how many lagged variables to include in a time series analysis or autoregressive model. It aids in determining the ideal lag duration for capturing the data's autocorrelation structure.

The basic purpose of lag order selection is to balance the model's overfitting and underfitting. Including too many lags might result in overfitting, which causes the model to become overly complex and perform badly on new data. Using too few lags, on the other hand, may result in underfitting, in which key patterns and relationships in the data are not fully represented.

The lag order selection test was conducted to determine the optimal number of lags that would improve the accuracy of our model. The results of that test are presented in Appendix 2, where we can observe from the table that the z-score of each year's ESG ( $t=0,1,2,3,4$ ), increases until  $t=2$  and then it starts decreasing again for both the dependent variables. Consequently, I concluded that the optimal number of lags is two. As a result, two lags will be used in the variables that are needed to address the problem of time.

In this study, the temporal aspects of the variables will be appropriately accounted for, by incorporating a lag of two time periods. These variables encompass the ESG score and its

constituent components (ENV, SOC, GOV), as well as the board characteristics (G\_DIV, B\_IND, B\_SIZE), all of which are relevant to addressing the research problem.

## Descriptive Statistics

Table 2 presents the descriptive statistical values for mean, standard deviation (SD), minimum and maximum. The descriptive statistics provide valuable insights into the dataset's variables. Firstly, the ESG scores demonstrate a moderate level of dispersion, with a mean of 63.371 and a standard deviation of 17.93. This indicates that companies have varied environmental, social, and governance performance. The environmental score also shows considerable variability, with a wider range of values (0.28 to 99.162) and a higher standard deviation (23.447). This suggests that the companies of our sample exhibit diverse environmental practices and initiatives. Similarly, the social and governance scores display notable differences among companies, as reflected in their respective means and standard deviations. These statistics highlight the significance of ESG factors, and the varying degrees of emphasis placed on environmental, social, and governance aspects by different organizations.

When analyzing the financial indicators, I found that the mean return on assets (ROA) was 0.054. However, the relatively high standard deviation of 0.063 suggests significant variation in the profitability of companies. Tobin's Q (Intobinsq), a measure of firm value, demonstrates substantial dispersion as well, with a mean of -.152 and a standard deviation of 1.178. This indicates diverse market valuations and potential differences in investors' perceptions of firms' prospects. The relatively low mean of 0.216 for the leverage variable suggests that the sample companies tend to have a conservative approach to debt financing. This indicates that they rely less on debt to finance their operations or investments, potentially resulting in lower financial risk and greater stability. However, the wide range of values (0 to .995) suggests that some firms may employ higher leverage strategies. These financial indicators provide insights into the performance and financial structure of the companies included in the dataset.

- **Table 2. Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max
Tobin's Q	-.152	1.178	-5.144	4.359
ROA	.054	.063	-.065	.3255
ESG	63.371	17.93	2.597	95.988
ENV	63.182	23.447	.28	99.162
SOC	66	21.184	2.056	98.294
GOV	60.089	21.867	3.571	97.932
SIZE	23.094	1.669	13.719	28.612
LEV	.216	.171	0	.995
G_DIV	28.164	13.04	0	75
B_IND	61.066	23.423	0	100
B_SIZE	10.827	3.623	1	25

**Source:** The author's calculations



## Correlation Matrix

The correlation matrix for each of the study variables is shown in Table 3. The correlation coefficients are not very high, showing that our estimations are not affected by collinearity among the independent variables. The research shows that, apart from leverage, the ESG score variable has a strong positive relationship with all of the other factors in the matrix. Furthermore, the ESG score has a strong association with its individual components, which aligns logically. Furthermore, except for Board Independence, both dependent variables show a strong relationship with almost all explanatory variables. This indicates that the variables chosen for the model are suitable and relevant. Finally, the size of the board has a statistically significant link with the size of the company, corroborating the reasoning for this result.

• **Table 3. Pairwise correlations**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Intobinsq	1.000										
(2) ROA	0.617* (0.000)	1.000									
(3) ESG	-0.163* (0.000)	-0.123* (0.000)	1.000								
(4) ENV	-0.255* (0.000)	-0.136* (0.000)	0.785* (0.000)	1.000							
(5) SOC	-0.086* (0.000)	-0.081* (0.000)	0.888* (0.000)	0.665* (0.000)	1.000						
(6) GOV	-0.150* (0.000)	-0.121* (0.000)	0.670* (0.000)	0.274* (0.000)	0.372* (0.000)	1.000					
(7) SIZE	-0.724* (0.000)	-0.319* (0.000)	0.375* (0.000)	0.445* (0.000)	0.316* (0.000)	0.209* (0.000)	1.000				
(8) LEV	-0.039* (0.012)	-0.018 (0.209)	0.022 (0.144)	0.010 (0.515)	0.037* (0.013)	-0.038* (0.010)	0.023 (0.109)	1.000			
(9) G_DIV	-0.039* (0.022)	-0.097* (0.000)	0.341* (0.000)	0.227* (0.000)	0.290* (0.000)	0.276* (0.000)	0.083* (0.000)	-0.063* (0.000)	1.000		
(10) B_IND	0.007 (0.680)	-0.022 (0.145)	0.253* (0.000)	0.089* (0.000)	0.159* (0.000)	0.368* (0.000)	0.028 (0.084)	0.001 (0.971)	0.135* (0.000)	1.000	
(11) B_SIZE	-0.322* (0.000)	-0.169* (0.000)	0.326* (0.000)	0.360* (0.000)	0.308* (0.000)	0.113* (0.000)	0.456* (0.000)	0.043* (0.005)	0.098* (0.000)	-0.233* (0.000)	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Source:** The author's calculations

## Regression Analysis

The findings of the regression analysis are provided in Tables 4 and 5, where Tobin's Q and ROA are employed as the dependent variables, respectively. The outcomes of the Hausman test indicate that the estimators of random effects exhibit inconsistency, while the estimates of fixed effects are deemed more appropriate for all models. The test results demonstrate a p-value below 0.005 at a significance level of 5%. Consequently, the null hypothesis is rejected, favoring the utilization of

a fixed effect model. Models 1a-6a correspond to those with Tobin's Q as the dependent variable, whereas models 1b-6b pertain to those with ROA as the dependent variable. The selected models in this analysis exhibit statistical significance, and the R squared values range from 0.125 to 0.445, indicating an acceptable level of explanatory power.

The results are accepted in both models 1a and 1b for the overall ESG score, showing significant results for both independent variables and control factors. At a 99% confidence level, the link between ESG-CFP is significant and negative in both Tobin's Q ( $\beta = 0.004$ ;  $p < 0.01$ ) and ROA ( $\beta = 0.0002$ ;  $p < 0.01$ ). As a result, the amount of CFP (both in accounting and market based) of the corporations will decline as ESG disclosure increases. The aforementioned findings align with the research conducted by Buallay (2019), Grisales and Aguilera-Caracuel (2019), Lee et al. (2009), Garcia and Orsato (2020), Mittal et al. (2008), Crisóstomo et al. (2011), Velte (2017), and the conventional shareholder primacy theory proposed by Milton Friedman in his work "Capitalism and Freedom" (1963). Additionally, the studies conducted by Borovkova and Ying Wu (2020), and Singh and Shome (2022) also lend support to these findings. Consequently, the hypothesis H1 is not supported by the evidence presented.

The environmental (ENV) score was employed as the independent variable in Models 1b-1c. Our findings reveal that the relationship between ENV scores and CFP in our sample is negative and statistically significant for both Tobin's Q ( $\beta = 0.002$ ;  $p < 0.01$ ) and ROA ( $\beta = 0.00015$ ;  $p < 0.01$ ), contradicting Hypothesis H1a. For the study period (2012-2022), environmental performance does not result in a rise in CFP, rejecting Hypothesis H2a.

The social (SOC) component is employed as the independent variable for models 3a and 3b. The hypothesis H1b is rejected because there is no evidence for a significant positive relationship between SOC and CFP both Tobin's Q ( $\beta = 0.0009$ ;  $p < 0.05$ ) and ROA ( $\beta = 0.00001$ ;  $p < 0.1$ ), as was observed.

I utilize the governance component (GOV) as the independent variable in models 4a and 4b. Once more, the governance is negative and significant for Tobin's Q ( $\beta = 0.003$ ;  $p < 0.01$ ) and ROA ( $\beta = 0.0001$ ;  $p < 0.05$ ) in both models 4a and 4b. Governance as a part hence has no impact on the CFP. These findings enable us to disprove the H1c hypothesis.

### ***Moderators***

The analysis conducted revealed that the presence of board gender diversity plays a crucial role in influencing the relationship between environmental, social, and governance (ESG) practices and corporate financial performance. While the direct impact of ESG practices on performance lost its significance, the interaction term ESG\*G\_DIV demonstrated high significance at a confidence level of 99%. These findings underscore the necessity of considering board gender diversity when assessing the influence of ESG practices on financial performance, thereby emphasizing the importance of promoting diversity within corporate boards and supporting the H2 hypothesis.

Upon introducing the moderator ESGG\_DIV to the analysis, it becomes evident that the significance of ESG diminishes, while the ESG\*G\_DIV interaction remains insignificant. Consequently, it can be inferred that board gender diversity (G\_DIV) does not have a significant impact on the relationship between ESG and corporate financial performance (CFP). Various

factors can account for the varying importance of the board gender diversity moderator in the association between ESG practices and financial success.

Firstly, the market-based indicator, Tobin's Q, incorporates investors' expectations and assessments of a company's future prospects, rendering it sensitive to market sentiment. Considering investors' forward-looking perspectives, the relevance of the relationship between ESG practices and financial performance may be more pronounced, thereby explaining the robust results observed when utilizing Tobin's Q. Conversely, return on assets (ROA), an accounting-based measure of past performance, may not fully capture the influence of ESG policies on short-term financial outcomes.

Secondly, the timescale and lag effects are crucial factors to consider. Tobin's Q represents expected future performance, capturing investors' expectations, while ROA reflects more immediate performance. In contrast to the immediate financial performance indicated by ROA, ESG practices may exert a greater influence on future market value expectations captured by Tobin's Q.

Lastly, industry-specific and company-specific factors, as well as data quality and availability, can contribute to the observed differences. Different industries may display varying sensitivities to ESG practices, and issues related to data quality can affect the accuracy of estimations. These combined considerations underscore the significance of comprehensively understanding the metrics employed and the contextual elements that shape the relationship between ESG practices, board gender diversity, and financial performance.

The analysis conducted aimed to examine the moderating effect of board independence (B\_IND) on the relationship between environmental, social, and governance (ESG) factors and company financial performance (CFP). The findings indicated that the coefficient for ESG remained significant and unchanged even after introducing the moderator variable ESGB\_IND. However, the coefficient for ESGB\_IND was found to be statistically insignificant. These results suggest that board independence does not have a significant influence on the relationship between ESG factors and CFP. Consequently, the hypothesis H3, which proposed a moderating effect of board independence, was rejected.

These findings underscore that the impact of ESG factors on financial performance remains consistent irrespective of the level of board independence. Notably, when assessing performance using return on assets (ROA) as the metric, both the ESG score, and the board independence moderator were found to be statistically insignificant in the current research. However, when Tobin's Q was utilized as the performance metric, the ESG score exhibited statistical significance, while the board independence moderator did not. These contrasting findings suggest that the relationship between ESG practices, board independence, and financial performance may vary depending on the specific performance metric employed. The insignificance of the moderating variable could imply the existence of a more intricate relationship influenced by additional factors or potential limitations in the current model.

**Table 4. Regression results**

Variables	Tobin's q					
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
ESG	-.004(.0006)***	-	-	-	-.001(.001)	-.004(.001)***
ENV	-	-.002(.0004)***	-	-	-	-
SOC	-	-	-.0009(.000)*	-	-	-
GOV	-	-	-	-.003(.000)***	-	-
SIZE	-.167(.02)***	-.152(.02)***	-.16(.02)***	-.172(.020)***	-.173(.020)***	-.166(.020)***
LEV	-.941(.089)***	-.952(.088)***	-.95(.089)***	-.92(.088)***	-.941(.088)***	-.942(.089)***
G_DIV	-.002(.000)***	-.003(.000)***	-.003(.000)***	-.002(.000)***	-.003(.000)*	-.002(.000)***
B_SIZE	-.002(.003)	-.004(.003)	-.005(.003)	-.004(.003)	-.002(.003)	-.001(.003)
B_IND	-.0005(.0004)	-.001(.0004)**	-.001(.000)**	-.000(.000)	-.0005(.000)	-.001(.001)
ESG*G_DIV	-	-	-	-	-.000(.000)***	-
ESG*B_IND	-	-	-	-	-	8.54(.0000)
_cons	4.256	3.90	4.053	4.357	4.278	4.278
VIF	1.30	1.26	1.24	1.25	5.80	6.27
R Squared	0.408	0.408	0.421	0.445	0.415	0.408
Hausman	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Test (P-value)						
F-stat	66.1***	62.22***	61.05***	69.32***	58.07***	56.67***

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Source:** The author's calculations

**Table 5. Regression results**

Variables	ROA					
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
ESG	-.0002(.000)***	-	-	-	-.000(.000)	-.000(.000)
ENV	-	-.00015(.000)***	-	-	-	-
SOCIAL	-	-	-.00001(.000)*	-	-	-
GOV	-	-	-	-.0001(.000)**	-	-
SIZE	-.0057(.001)***	-.0056(.001)***	-.005(.007)***	-.006(.002)***	.006(.001)***	-.006(.001)***
LEV	-.074(.007)***	-.0755(.007)***	-.074(.007)***	-.074(.007)***	-.074(.007)***	-.074(.007)***
G_DIV	-.000(.000)	-.000(.000)*	-.000(.000)*	-.000(.000)	-.000(.000)	-.000(.000)
B_SIZE	-.000(.000)*	-1.58(.000)*	-.000(.000)**	-.000(.000)**	-.000(.000)*	-.000(.000)*
B_IND	-.000(.000)	-.000(.000)*	-.000(.000)	-.000(.000)	-.000(.000)	-.000(.000)
ESG*G_DIV	-	-	-	-	-3.68(3.00)	-
ESG*B_IND	-	-	-	-	-	-2.13(1.85)
_cons	.232	.229	.230	.230	.230	.226
VIF	1.29	1.25	1.23	1.23	5.82	6.12
R Squared	0.1312	0.1252	0.1386	0.1420	0.1312	0.1299
Hausman Test (P-value)	0.000	0.000	0.000	0.000	0.000	0.000
F-stat	15.09***	15.94***	14.56***	12.83***	13.09***	12.97***

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: The author's calculations

## Discussion and Conclusion

This study investigated the relationship between ESG (ENV, SOC, and GOV) and company performance, considering the moderating role of board characteristics. The analysis utilized panel data from EUROSTOXX 600 companies spanning the period from 2012 to 2022. Employing a fixed effects model, the study found a significant and negative relationship between ESG and its components with both financial performance measures, namely Return on Assets (ROA) and Tobin's q. These results indicate that companies with higher ESG scores experienced lower financial performance, suggesting potential trade-offs between social and environmental responsibility and financial outcomes. Additionally, the study revealed that board gender diversity exhibited a significant and negative association with Tobin's q, while board independence showed no significant impact on either financial performance measure.

The findings have important implications for various stakeholders, including investors, managers, policymakers, and board members. The negative relationship between ESG and financial performance highlights the need for a balanced approach to sustainability efforts, acknowledging potential trade-offs. This suggests that companies should carefully consider the financial implications of ESG initiatives and integrate them effectively into their overall business strategies. The significant impact of board gender diversity on market valuation underscores the importance of diverse perspectives in shaping investor perceptions and underscores the value of gender equality and inclusivity in corporate decision-making. However, the lack of significant effects of board independence emphasizes the need for further examination of the role of board characteristics in the context of ESG and company performance.

When analyzing the results, a number of limitations should be taken into consideration. Firstly, the study focused exclusively on EUROSTOXX 600 companies, limiting the generalizability of the results to firms in other regions or markets. One limitation of this study pertains to the availability and quality of ESG data. ESG metrics and reporting frameworks are relatively new, and there is a lack of standardized and consistent data across companies and industries. Organizational differences in ESG factor assessment and reporting could result in measurement inaccuracies and problems with comparability. Furthermore, this study's data came from publicly accessible sources, which might not fully reflect a company's ESG performance and policies. In addition, the study was based on cross-sectional panel data, which could limit the ability to establish causal links and accurately depict dynamic changes over time. The study also ignored other non-financial performance metrics that might have provided a more thorough understanding of the connection between ESG and firm performance in favor of focusing solely on financial performance measurements. Finally, while efforts were made to control for relevant variables, the presence of unobserved factors may still influence the relationship under investigation.

In conclusion, this study contributes to the understanding of the relationship between ESG, board characteristics, and company performance. The findings indicate a significant and negative relationship between ESG and CFP, while the examined board characteristics partially weaken this relationship. These results emphasize the importance of striking a balance between sustainability efforts and financial outcomes. Although the study has several limits, it offers useful insights that can aid boards, managers, investors, and politicians in making decisions. Future studies should broaden their focus to encompass a wider variety of businesses and industries, emphasize in specific industries, consider more performance metrics, investigate alternative contextual factors,

and apply advanced econometric approaches to resolve any endogeneity issues that may arise. By addressing these avenues, future studies can advance our understanding of the complex interplay between ESG, board characteristics, and company performance, facilitating more informed and sustainable business practices.

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## Appendices

### Appendix 1- Durbin-Watson test for autocorrelation

<b>Model</b>	<b>DW</b>
1a	1.56
2a	1.55
3a	1.55
4a	1.56
5a	1.56
6a	1.56
1b	1.71
2b	1.70
3b	1.71
4b	1.71
5b	1.71
6b	1.71

**Source:** The author's calculations

### Appendix 2 - Optimal lag selection test

<b>z-score</b>	<b>Tobin's Q</b>	<b>ROA</b>
<b>ESG</b>	-5.51	5.4
<b>I1ESG</b>	-6.11	-11.06
<b>I2ESG</b>	<b>-9.86</b>	<b>-11.07</b>
<b>I3ESG</b>	-5.44	-9.86
<b>I4ESG</b>	-2.06	-7.81

**Source:** The author's calculations