Master Thesis

ESG (environmental, social and governance) ratings and board gender diversity: The moderating role of CEO gender

MSc in Accounting, Auditing & Control

Academic Year 2022-2023

Konstantina Agalioti, 659556

Erasmus University Rotterdam – Erasmus School of Economics

Supervisor: Jochen Pierk, Department of Accounting, Auditing & Control

Second assessor: Wenjiao Cao, Department of Accounting, Auditing & Control

Date: 06/07/2023

Preface

The content of this thesis is the sole responsibility of the author and
does not reflect the view of either the supervisor, second assessor, Erasmus School of Economics or Erasmus University.

Contents

Executive Summary **4**

Chapter 1- Introduction **5**

Chapter 2 – Literature Review and hypotheses development **8**

2.1 Board gender diversity and ESG ratings 8

2.2 The moderating effect of CEO's gender 12

Chapter 3 – Research Design and Data **15**

3.1 Measurement of variables 15

3.1.1 Dependent variable 15

3.1.2 Independent variables 16

3.1.3 Moderating term and Control variables 16

3.2 Sample and data collection 17

3.3 Design of the regression analysis 22

Chapter 4 – Results and Discussion **23**

Chapter 5 – Conclusion **27**

5.1 Summary 27

5.2 Implications 28

5.3 Limitations and future research 28

Chapter 6 – References **29**

List of tables

Table 1: Summary Statistics 19

Table 2: Correlation Matrix 21

Table 3: Regression Analysis: Board gender diversity and ESG ratings 24

Table 4: Regression Analysis: The moderating effect of CEO gender 26

Executive Summary

In recent years, the integration of gender equality and sustainability into the core operations and strategies of the firms has become a critical factor for their long-term survival and success. Investors demands and social expectations regarding these issues have risen significantly, causing a mounting pressure to businesses to adopt more sustainable practices and ensure that females employees are treated equally. Based on the agency theory, the resource dependence theory and the stakeholder's theory, the purpose of this paper is to investigate the association between board gender diversity and the environmental, social and governance performance of the firm. Furthermore, it also examines the influence that the gender of the company's CEO has on this relation. A panel data analysis is conducted on a sample consisting of the firms listed on the S&P 1500 index for the years 2015-2021. The sustainability performance of the firms was captured through the ESG ratings. The data about these ratings and the degree of female representation on corporate boards were collected from Refinitiv Eikon database while the data regarding the gender of the companies' CEOs were retrieved from the ExecuComp database. Using Ordinary Least Squares regressions with fixed effects included, this research finds that there is a strong positive relation between gender diverse boards and the corporate ESG performance. Furthermore, the moderating effect of CEO's gender on the baseline relationship is not found to be economically or statistically significant. The empirical findings of this study highlight the importance of gender diversity as a driver of sustainable and responsible business practices, encouraging in this way the regulators and policymakers to implement stricter regulations and take more initiatives to support gender diversity on corporate boards.

Chapter 1 – Introduction

The significance of sustainability and gender equality within a firm has experienced a remarkable growth during the past few years. One of the most prevalent ways to capture the performance of the company in these sectors is through its environmental, social and governance (ESG) ratings and rankings. There are several rating agencies and organizations that provide this kind of assessment for companies considering factors such as their environmental impact, their diversity levels and their corporate governance mechanisms. Indeed, nowadays businesses have come to realize that by taking actions to improve their ESG performance, including efforts to increase the presence and power of women within the firm, their reputation, resilience and long-term profitability will be enhanced. Moreover, in this way the company demonstrates its transparency, accountability and commitment to stakeholder interests and creates a relationship of trust and loyalty with them. In this sustainability context, many legislations have emerged that aim to enhance the power of women employees and promote corporate gender diversity. More specifically, many countries have implemented anti-discrimination laws to protect the company employees from discriminations based on their gender and a lot of gender quota laws have been voted that aim to increase the presence of women in leading positions within a firm. For instance, the Norwegian government in 2006 enacted a regulation that demanded the percentage of female directors on corporate boards to be 40%. Similar regulations have been voted on many other European countries such as in Spain, Iceland, France and Netherlands. Moreover, in Canada and California, in 2006 and 2018 respectively, laws related to board gender representation were also enforced, indicating that a global effort is taking place to promote corporate gender equality.

Moreover, a concept quite related to a company's ESG performance is the corporate social responsibility (CSR) performance of the firm. ESG and CSR are both sustainability perspectives which demonstrate that businesses are committed to sustainable corporate practices. In addition, CSR is often perceived as the precursor of ESG. Consequently, besides certain differences they have concerning their scope, obligatoriness or stakeholder engagement, I will use during my thesis these terms interchangeably to refer to the firm's sustainability performance.

As it is obvious from the previously mentioned regulations, one of the most common ways to investigate the levels of gender diversity within a firm and ensure that female employees are treated equally, is by examining the number of women on corporate boards. Boards of directors play a crucial role in the governance and performance of the firm, as they are responsible for the company's strategic choices, they identify and manage risks and point out and monitor the managers of the firm. Moreover, they represent stakeholder's interests and are accountable for providing and considering diverse perspectives and experiences during the decision-making process. Consequently,

equal presence of women directors is essential to make sure that the board can fulfill its duties and perform effectively.

Many researchers have investigated the relation between board gender diversity and the company's environmental, social and governance performance, yet the findings are still mixed. More specifically, many studies have revealed that the association between gender diverse boards and the corporate sustainability outcomes is positive [Roberta Provasi and Murad Harasheh (2020), Khwaja Naveed et al. (2021), Habiba Al-Shaer and Mahbub Zaman (2016), Corinne Post and Kris Byron (2016)]. However, there are also researchers who reported that the presence of females on the boards affects negatively the ESG performance of the firm [Husted and Sousa-Filho (2019), Glass et al. (2016)] or that were not able to find any link between the two variables [Campopiano et al. (2019), Isabel Gallego-Alvarez et al. (2009), Jeremy Galbreath (2011)]. All these studies have been based on certain theories including the agency theory, the resource dependence theory and the stakeholder theory. According to the agency theory, female directors can improve the monitoring and reduce the agency problems within a firm, while according to resource dependence theory and stakeholder theory, women offer diverse resources and perspectives and improve the relationship of a firm with its stakeholders. Moreover, many studies have also discovered a variety of factors that moderate the baseline association. For instance, Alessandro Cirillo et al. (2020) showed that when the CEO of the company is at the same time the chairman of the board, the positive effect that board gender diversity has on the company's ESG outcomes is weakened.

Due to the contradictory and ambiguous results that exist regarding the relation between board gender diversity and the sustainability performance of the firm, the first part of this research involves the examination of the association between the two variables with the aim to make more clear inferences regarding their connection. However, the main contribution of this study to the existing literature is the exploration of the influence of a factor on the baseline relationship that has barely been previously investigated. This factor is the gender of the company's CEO. According to many studies, women in corporate leading positions, such as CEOs, have a significant positive impact on the company's financial performance and value [Micaela Rodrigues et al. (2022), Walayet A. Khan and Joao Paulo Vieito (2013), Cristian L. Dezso and David Gaddis Ross (2012)]. Furthermore, female CEOs have also been proved to be positively associated with the firm's sustainability performance [Mikko H. Manner (2010), Richard Borghesi et al. (2014), Mi-Hee Lim Jee and Yong Chung (2020)]. Moreover, it is also found that CEO gender strengthens the positive relationship between board gender diversity and the environmental performance of the firm [Giuliana Birindelli et al. (2019)]. Consequently, it would be interesting to investigate whether the presence of female CEOs would moderate the relationship between gender diverse boards and the firm's environmental, social and governance performance. In summary, the research question of this paper is:

1)Whether there is a positive association between board gender diversity and the environmental, social and governance (ESG) ratings of the firm.

2)Whether the presence of female CEOs strengthens the positive relation between board gender diversity and the company's ESG performance.

As was previously mentioned, the findings regarding the first scale of this research question are mixed. There are many reasons that have possibly led to these inconsistent results. One of the most important is the divergence of the ESG ratings provided by different rating agencies. ESG ratings involve subjective judgements and interpretations of the data. Moreover, there are many different data sources on which rating agencies rely, which can lead to diverge assessments. I will measure the sustainability performance of the firm using the total ESG ratings provided by the Refinitiv database. Furthermore, I used the Execucomp database to retrieve data related to the gender of the companies' CEOs. Finally, to obtain data necessary to create the control variables I used several databases including the BoardEX and the Refinitiv database to generate corporate governance variables and the Compustat database for the financial variables. To examine the association between gender diverse boards and the corporate sustainability performance and the moderating role of CEO gender, I conducted an ordinary least squares (OLS) regression analysis in a sample consisting of the firms listed on the S&P 1500 index.

The empirical tests showed that a strong positive association exists between the level of female representation on corporate boards and the environmental, social and governance performance of the firm. However, this relation does not appear to be strengthened by the presence of female CEOs. The effect of women CEOs on this relationship is neither economically nor statistically significant.

This paper contributes to the existing literature in several ways. Initially, it provides strong evidence about the connection between gender balanced boards and the company's sustainability performance. As it was previously mentioned, no clear inferences can be drawn from the previous literature regarding the relationship of the two variables, so the significant positive correlation that is found enhances the view that the two variables are positively linked. These findings also have important implications for the policymakers and the shareholders of the firm. Since board gender diversity is found to be positively correlated to the company's ESG ratings, regulators will be motivated to impose stricter measures regarding the presence of females on corporate boards. Moreover, shareholders will be encouraged to appoint more females as directors, attaching in this way more importance to their contribution in the corporate governance and in the decision-making process of the firm. In addition, even though previous researchers have examined the moderating role of several factors in this relation, the evidence regarding the influence of CEO personal traits is quite limited. Hence, despite the lack of significance in the results,

this study is one of the first that provides evidence about the moderating role of CEO gender on the relationship between gender diverse boards and ESG ratings.

Chapter 2 - Literature review and hypotheses

2.1 Board gender diversity and ESG ratings

A wide variety of papers have examined the effect of female board representation on a firm's ESG outcomes. However, the findings concerning the association between the two variables are mixed.

Most papers have indicated that the presence of female directors on the board has a positive impact on the ESG performance of the firm. Corinne Post and Kris Byron (2016) conducted a meta-analysis and found that in countries with greater gender parity and in firms where boards are more willing to use the resources which are derived from the presence of female directors, board gender diversity has a positive effect on investors evaluations regarding the sustainability performance of the firm. In addition, Bear et al. (2010) found that boards of directors with a higher number of female members will be associated with better sustainability outcomes. According to them, these results arise thanks to the behavior of females in leading positions which is different from this of men. Women tend to be more sensitive towards environmental or social issues, leading to higher CSR ratings. Furthermore, Muhammad Nadeem et al. (2020) also investigated the impact of gender diverse boards on the environmental behavior of the company and found that women on boards promote environmental innovation, with this effect being more pronounced in environmentally conscious and less profitable businesses.

Towards the same direction, Mohammad Hassan et al. (2020) examined the effect of board gender diversity on the ESG scores using a sample of banks located in the US and found that there is a positive nonlinear relationship between gender balanced boards and an entity's ESG performance. In addition, they examined whether the effect of ESG controversies weakens this relation, but they were not able to find significant results. Moreover, Elisa Menicucci and Guido Paolucci (2020) examined the relation between gender diverse boards and ESG scores using a sample of Italian banks and although they confirmed that women on boards have a positive impact on a company's ESG performance, they also suggested that this impact is not linear, as when a critical mass of three women is reached, this influence becomes non-significant. Finally, Walid Ben-Amar et al. (2015) found that firms with a higher number of female directors on their boards are more likely to make voluntary disclosures related to the environmental outcomes of the company, in accordance with stakeholders demands. In this way, gender diverse boards lead to more sustainable firms and better ESG outcomes.

All these findings, suggesting that there is a positive relation between board gender diversity and the environmental, social and governance performance of the firm are also consistent with certain theories such as the agency theory, the resource dependence theory and the stakeholder theory.

Agency theory suggests that conflicts of interest might arise between the shareholders of a company and its managers and emphasizes the need to find solutions to mitigate this issue. Consequently, this theory is directly related to board gender diversity, as having diverse boards is one of the potential remedies to the agency problems arising within a company. Initially, it is proved that the presence of women on boards is associated with increased monitoring of managers. For instance, Hillman and Dalziel (2003) argued that board capital structure affects the effectiveness of management monitoring, while Adams and Ferreira (2009) found that female directors have better attendance records than men and participate in monitoring committees more often. Moreover, Rey Dang et al. (2014) conducted research in France to make inferences regarding the individual traits of women on board in order to identify differences between female and male directors. One of their main findings was that women directors tend to be more independent than their male counterparts, resulting in more effective monitoring of management choices and corporate strategies.

Furthermore, the presence of females on board is linked with increased levels of ethical compliance within a firm. More specifically, there is a wide variety of studies proving that women directors tend to be more ethically responsible than the male ones. For instance, Guadalupe del Carmen and Briano-Turrent (2020) investigated whether the presence of women on board affects the ethical performance of Latin American companies, using five different ethical corporate governance dimensions. They found that board gender diversity has a positive impact on most of them, proving that female directors are significantly associated with the level of corporate ethical compliance and behavior. On top of that, they discovered that this positive impact is stronger for a critical mass of three women. In addition, Susan M Bosco and Veronica L Columb (2009) found that there is a positive relationship between a higher proportion of female directors and the inclusion of a company on a list of Ethisphere Magazine that contains the world's most ethical companies. More specifically, firms with more women on their board are related to higher levels of innovation, transparency and involvement in corporate socially responsible activities, which are fields where the company's performance is critical in order to be contained in this list. Consequently, it is evident from this wide body of literature that more gender balanced boards are not only associated with increased monitoring of managers but also enhance the firm's ethical performance.

Regarding the resource dependence theory, it states that firms rely on valuable resources for their survival and growth. As a result, the presence of females on board is essential as women provide perspectives, knowledge, skills and experience during the decision-making process that might be different compared to these of men. In this way, diverse

boards enhance the organization's access to critical external resources and promote the company's development. Robert J. Williams (2003) reported that firms with a higher percentage of women directors tend to participate more in philanthropic activities compared to firms with less gender balanced boards. These findings suggest that females tend to be more sensitive towards social issues and more motivated to help other people compared to men. In addition, Alison M. Konrad, Vicki Kramer and Sumru Erkut (2008) found in their study that companies are significantly benefited from the presence of women directors, especially when their number exceeds the critical mass of three. More specifically, they conducted many interviews, which revealed that females present different viewpoints during the decision-making process, enhance the content of the discussions of the board, and bring up issues that concern various stakeholders who are affected by the company's performance.

Furthermore, a higher number of women on boards enhances the organizational reputation and legitimacy, as stakeholders perceive the company as more inclusive, fair, and socially responsible. For instance, Stephen Bear et al. (2010) indicated that the number of female directors is positively associated with the firm's CSR strength ratings, which in turn have a positive impact on the firm's overall reputation. In this way, the presence of women on board improves the company's prestige, thanks to its contribution to the corporate CSR performance. Moreover, Juan Carlos Navarro-García et al. (2020) also investigated the relation between women directors and the firm's reputation in the context of Spain and confirmed that indeed more females on the board enhance the corporate reputation. However, this positive impact appears to be unrelated to their level of education or to the number of their directorships, suggesting that the firm's reputation possibly increases because stakeholders generally appreciate the presence of women in positions of responsibility. These findings are also consistent with the stakeholder theory. According to this theory, management should have a good relationship with the firm's stakeholders and create value for them to survive and thrive in the long run. As a result, by promoting gender diversity on boards, organizations acknowledge the fact that the presence of female directors increases the likelihood of considering a broader range of stakeholder interests and improves the board's effectiveness and corporate governance. Finally, this theory is also supported by the findings of Nerantzidis et al. (2022) who after figuring out that a positive association exists between women directors and certain corporate responsibility dimensions, they concluded that women tend to pay more attention to stakeholder's interests and demands than men.

In addition, many researchers have discovered factors that moderate the relation between board gender diversity and ESG performance of the firm. For instance, Mauro Romano et al. (2020) after proving that more gender balanced boards receive higher ESG ratings, they examined how CEO duality affects this relationship. They found that when the CEO of the company is at the same time the chairman of the board, the positive effect that board gender diversity has on the firm's sustainability performance is decreased.

Moreover, James J. Cordeiro et al. (2019) examined the moderating effect of the majority controlling ownership in family-controlled and dual class firms. In these kinds of firms, women are considered to have higher chances to be pointed out as directors compared to other ownership structures. Indeed, the results confirmed that the positive effect of board gender diversity on the firm's environmental performance is stronger in these ownership contexts. Furthermore, Li et al. (2017) after proving that the presence of women on board is positively associated with the environmental policy of the firm, they suggested that a company's possibility to pollute the environment moderates this positive association. Finally, Subba Reddy Yarram et al. (2020) reported that board gender diversity does not affect CSR dimensions when there is a token female representation on the director's board.

However, it is important to mention that a significant number of researchers were not able to find a positive link between board gender diversity and a firm's ESG performance and have concluded that the two variables are not related to each other or are negatively correlated. For instance, Campopiano et al. (2019) reported that women directors who are part of controlling families do not have a positive impact on the corporate ESG performance. Moreover, according to the agency theory, it is assumed that the expected positive effect is driven by the impact of board diversity on board's independence. Still, there are some researchers who argue that board's independence does not influence firms' performance in the long-term. This is the case with the study of Bhagat and Black (2001). Furthermore, Luis Rodriguez-Dominguez et al. (2009) based on previous studies claimed that female directors tend to be more sensitive ethically during the decision-making process and examined whether their presence on boards leads to more ethical companies. Surprisingly, their results showed that a higher presence of women on boards does not increase the level of ethics in companies. In addition, Nicola Cucari et al. (2017) using a sample of Italian listed companies found a negative relation between women on boards and voluntary ESG disclosure, which is positively associated with the ESG ratings of the company (June Huang and Shirley Lu (2022)).

Similar findings are reported by Husted and Sousa-Filho (2019) who examined the effect of board gender diversity on ESG disclosure in Latin America and found that female directors have a negative impact at the levels of ESG disclosure. Moreover, Glass et al. (2016) found only a marginally significant relationship between women directors and the environmental performance of the firm and a small positive effect regarding the combination of women CEOs and the presence of female directors on the board. Isabel Gallego-Alvarez et al. (2009) using a sample of Spanish listed companies and a wide variety of market and accounting performance measures, reported that firms with higher levels of gender diversity, including diversity on their boards, did not perform better compared to less diverse firms. As a result, according to them board gender diversity is unrelated to the sustainability performance of the company. Finally, certain researchers reported that the behavior between men and women does not differ in sectors that could

affect the ESG performance of the firm. For example, Tsalikis and Ortiz -Buonafina (1990) reported that the two groups have similar ethical behavior and reactions. As a result, if differences in the behavior of the two sexes does not exist, board gender diversity will not affect the firm's sustainability performance.
Moreover, on top of the above results, there are cases in which the findings regarding this relationship are mixed. For instance, Jeremy Galbreath (2011) in his study suggested that a higher number of women directors leads to better economic and social outcomes. However, he was unable to find a significant positive link between gender board diversity and environmental outcomes. A possible explanation for these findings is that despite the positive impact of female directors on the relation of the firm with its stakeholders and on the levels of ethical conduct, board members might be more reluctant to accept the opinion of women during the decision-making process regarding environmental issues, reducing in this way their influence in this sector. Furthermore, certain studies support that although female directors have an impact on the firm's CSR activities, this impact might be limited in some areas of CSR. That's the case with the study of Robert J. Williams (2003). Despite indicating that women directors encourage the engagement of the firm in charitable activities, he was not able to find a link between female presence in the boardroom and firms supporting educational and public policy issues.
As is obvious from the previously mentioned findings, it can be inferred that the results regarding the association between board gender diversity and the environmental, social and governance performance of the firm are mixed. Consequently, it would be interesting to examine whether these two variables are positively correlated, which leads us to the formulation of the first hypothesis:

Hypothesis 1: Board gender diversity is associated with higher environmental, social and corporate governance ratings.

2.2 The moderating effect of CEO's gender

A potential moderator of the relation between board gender diversity and a firm's ESG ratings is the CEO's personal characteristics and especially his gender, as it will possibly influence the extent to which board gender diversity translates into improved ESG performance. More specifically, many studies have examined the impact of CEO gender on the value and sustainability performance of the firm and have indicated that female CEOs are associated with better CSR ratings. These results are also in line with the upper echelons theory. According to this theory, manager's experience, values and personal characteristics such as their age or gender, have a significant impact on their decision-making process and on their risk management strategy, affecting in this way the overall performance of the firm. This theory also suggests that executives from diverse backgrounds can bring new perspectives to the firm and lead to more innovative

strategies. Consequently, it can be used to explain the impact that CEO gender has on the firm’s CSR performance, enhancing in this way the possibility that the existence of female CEOs will affect the relation between board gender diversity and ESG ratings.

Indeed, a lot of research has been conducted concerning the effect of CEO’s personal traits, including his gender, on the overall performance of the firm. Tiago Cruz Gonçalves et al. (2022) using a sample of European companies, examined the impact that the appointment of women to government positions in a firm, such as CEOs or Chairs, has on its value. The results not only proved that females in the top management influence positively the value of the firm, but also indicated that enterprises worth more in countries where women hold leading positions. Towards the same direction, Cristian L. Dezso and David Gaddis Ross (2012) found that including women to the top management team is beneficial to firm performance as it improves managerial task performance and encourages women in lower management levels to step up and behave according to their judgment and not as society expects them to act just because of their gender. They also found that the benefits derived from gender diversity are greater in innovative companies. In addition, Walayet A. Khan and Joao Paulo Vieito (2013) investigated the effect of CEO gender on the risk level of the firm and reported that when the CEOs are females, the company’s degree of risk is smaller, leading to improved overall performance. Besides that, they also stated that women CEOs are more encouraged to take risks due to differences in their compensation packages compared to men. Mara Faccio et al. (2012) also analyzed the impact of appointing female CEOs on the firm’s involvement in risk taking activities and reported that companies run by women managers make less risky choices, resulting in higher possibilities of survival and lower levels of volatility and leverage. However, it was found that the behavior of women, which are perceived as more risk averse than men, has a negative impact on the capital allocation process, possibly due to underinvestment or overinvestment behavior adopted by female CEOs. Finally, Li-Hsun Wang and Hung-Gay Fung (2022) examined the impact of appointing women as executives on stock tail risk and enterprise value. They found that female CEOs positively affect the firm’s stock tail risk and contribute significantly to the company’s development, as they tend to make more external investments leading to an increase in the company's value. According to the authors, this more aggressive investment policy adopted by female CEOs is due to the pressure of women to perform better to reach out to men.

Besides the beneficial effect that the presence of females in leading positions has for the company’s overall performance, a lot of researchers have also found significant evidence about its influence on the environmental, social and governance performance of the company as well. Richard Borghesi et al. (2014) investigated whether CEO’s personal traits, such as their gender, affect the degree to which they choose to invest in CSR activities. Indeed, they found that female CEOs tend to make more socially responsible investments. Additionally, Nhat Minh Trana and Bich-Ngoc Thi Phama (2020), using a

sample of small and medium-sized companies, also examined the impact of CEO's characteristics such as his gender on the corporate environmental performance of the firm. They discovered that female CEOs positively influence the performance of the firm in this sector. Moreover, Mikko H. Manner (2010) using ratings provided by KLD also found that companies with female CEOs tend to have better social performance, as they are positively related to KLD strength ratings. Furthermore, Shihping Kevin Huang (2013) proved that the gender of the CEO affects the CSR performance of the company, as captured by the consistency of its CSR ratings. Mi-Hee Lim Jee and Yong Chung (2020) found that female CEOs are more active concerning CSR activities, not only because they have different values from men, but also because they have stronger incentives due to the need for external support. Besides that, they also discovered that this positive effect is weakened when the power of the board of directors is relatively high. Towards the same direction, Cristina Gaio and Tiago Cruz Gonçalves (2022) reported that firms with a higher percentage of women on management teams tend to be more socially responsible, as they are linked to better CSR ratings. In addition, Chelsea Liu (2021) studied the relationship between employee relations, measured by labor lawsuits, and CEOs gender. Indeed, she found that the welfare of a company's employees was higher in companies with female CEOs, as the number of labor lawsuits was lower. Finally, Chelsea Liu (2008) discovered that the presence of more women on corporate boards and the appointment of female CEOs is linked to reduced corporate environmental violations. However, the influence of women CEOs applies only in firms that lack gender diversity on their boards. Moreover, they found that when the CEO is male, the contribution of board gender diversity in preventing this kind of violations is greater, as male CEOs tend to be overconfident regarding their investment choices and decisions, increasing in this way the chance to display misconduct.
However, it is important to mention that there are also several researchers who were not able to confirm that a significant relation exists between female CEOs and the ESG performance of a firm. For instance, Glass et al. (2016) examined how women CEOs affect the firm's environmental strategy not only individually but also when they interact with gender diverse boards. Even though a significant connection was found regarding the influence of women CEOs combined with the presence of female directors, the results concerning the effect of female CEOs on the environmental performance of the firm at an individual level were not significant. Additionally, Tom Aabo and Iasmina Cristina Giorici (2022) showed that the impact of CEO gender on the firm's ESG performance varies according to the data the researcher uses to examine this association. More specifically, for certain data providers they found that there is a significant positive relation between female CEOs and a company's ESG ratings, while for others no significant link was found. Moreover, Fizzah Malik et al. (2020) conducted research in emerging markets to also investigate the effect of CEO's personal characteristics on the sustainability performance of the firm. However, while other CEO traits like his age or

tenure had a significant impact on the firm's CSR disclosure, the effect of CEO's gender was proved to be insignificant.

Finally, there are certain studies that point out the role of CEO's gender as a moderating factor concerning the CSR performance of the firm. For instance, Giuliana Birindelli et al. (2019) using a sample consisted of banks located in Europe, Africa and Middle East also investigated how the placement of women in leading positions affects their environmental performance, in the context of critical mass theory. The results indicate that when the number of women directors on board exceeds a certain percentage, the environmental performance of banks is significantly affected. Female CEOs play an important role in the establishment of this positive relation and increase the benefits that board gender diversity has on the bank's environmental performance. Moreover, Hsuan-Lien Chu et al. (2022) also found that the presence of female CEOs mitigates the negative impact that powerful CEOs have on the engagement of the firm in CSR activities. Consequently, it is evident that a CEO's gender has a significant impact or serves as a moderating factor in relationships related to the sustainability performance of the firm. This fact leads us to the formulation of the second hypothesis, which involves the investigation of the influence that women CEOs have on the relationship between board gender diversity and a firm's ESG performance:

Hypothesis 2: When the CEO is female the association between board gender diversity and ESG ratings will be strengthened.

Chapter 3 – Research Design and Data

3.1 Measurement of variables

3.1.1 Dependent variable

The aim of this research is the investigation of the relation between board gender diversity and the firm's environmental, social and governance performance and the moderating role of CEO's gender. One of the most prevalent ways to capture the ESG performance of the company is the use of the environmental, social and governance ratings (**ESG**). These ratings are provided by the ESG rating agencies which are specialized organizations that assess, and rate companies based on their sustainability performance. One of the main limitations of ESG scores is the inconsistency and disagreement among different rating agencies which is caused by the lack of standardization and the subjectivity and bias included during the evaluation of a

company's sustainability performance. However, despite this issue, ESG scores remain one of the most efficient ways to provide investors and stakeholders with information about the firm's environmental impact, community engagement and ethical practices. In this research, overall company's ESG scores were retrieved from the Thomson Reuter's Refinitiv Eikon database. Refinitiv collects ESG data from a variety of data sources such as annual reports, regulatory filings and corporate websites and bases them in different models and methodologies. In this way, the ESG scores provided by this database lead to a more balanced and comprehensive perspective on a company's sustainability practices.

3.1.2 Independent variables

The first independent variable refers to the degree of female representation on the corporate boards. I measure it using a ratio obtained from the Refinitiv database that indicates the percentage of female directors on the board of each firm in the sample (**BGD**). Furthermore, regarding the second independent variable which concerns the gender of the CEO of each company, I used data from the Execucomp database that captures the gender of the respective CEOs. Subsequently, I created an indicator variable that equals 1 if the gender of the CEO is female and 0 otherwise (**CEO_FEMALE**).

3.1.3 Moderating term and Control variables

Interaction terms are used in statistical models to examine how the effect of one variable on an outcome can be modified or influenced by another variable. Hence, in this research I used an interaction term to investigate the moderating effect of CEO gender on the relation between board gender diversity and the environmental, social and governance performance of the firm. More specifically:

BGD_FEMALE= BGD * CEO_FEMALE is an interaction term for the CEO gender. When the CEO of a firm is female the association between board gender diversity and ESG performance is expected to be strengthened.

Moreover, to reduce the risk of omitted variable bias I included in the regression several control variables which can be divided into different categories. The first set of control variables are used to control the impact of corporate financial performance on the ESG ratings and were calculated using data from the Compustat database. These variables are the following:

Free cash flows (**FCF**) which was computed as the Operating income before depreciation (item13) – interest expenses (item15) – income taxes (item16) – capital expenditures (item128), scaled by the book value of total assets (item6)

Size of the firm (**Firm_Size**) which was computed as the log of book value of total assets (item6)

Tobin's q ratio (**Tobins_Q**) which was computed as the market value of assets over the book value of assets: (item6−item60 + item25 ∗ item199)/ item6

Leverage ratio (**Leverage_Ratio**) which was computed as the book value of debts (item34 + item9) over the market value of total assets (item6−item60 + item25 ∗ item199)

Market value of equity (**MV_Equity**) which was computed as the number of shares outstanding (item25) multiplied by the close market price at the end of the calendar year (item25 * item 24)

Return on Assets (**ROA**) which was computed as the Income before Extraordinary items divided by total assets (item 18/item 6)

The second set of control variables concerns the influence of corporate governance characteristics and CEO traits on the ESG performance of the company and were retrieved from the Refinitiv and BoardEX databases. These variables are: the total number of board members at the end of the fiscal year (**Board_Size**), the average number of years each board member has been on the board (**Board_tenure**), the percentage of independent board members (**Board_Ind**), the standard deviation of age of the company board members (**Board_Age**) and a variable that indicates whether the CEO of the company is simultaneously the chairman of the board (**CEO_Dual**).

3.2 Sample and data collection

As a research sample I used the companies listed on the S&P 1500 index. This index provides a thorough analysis of the US stock market as it combines companies from large-cap, mid-cap and small-cap segments, reflecting in this way the diversity of the US economy. Consequently, its use enables the examination of the relationship of interest in many American companies, for which data related to their ESG performance and the degree of gender diversification on their boards are widely available in many databases. Regarding the period of analysis, due to limited data availability the years 2015-2021 were selected. For the years prior to 2015, the ESG data for the firms included in the sample are inadequate. A possible explanation for this issue is the fact that the reporting and disclosure of ESG information in previous years was not as prevalent or standardized as it is now. However, in more recent years, the integration of ESG considerations into the investment decision-making process has led to an increase in investor's demand for robust and reliable ESG data, leading to a rise in data availability.

The data used to measure the sustainability performance of the companies and to create control variables related to corporate boards and CEO characteristics were retrieved from the Eikon database which is a specialist database from Refinitiv. This database was also used to collect information related to the level of female representation on the board of directors. Refinitiv is a database that offers a wide variety of data covering investment banking, macroeconomic indicators, corporate finance, and the corporate environmental, social and governance performance. In addition, the data used to identify the CEO gender of the firms in the sample were obtained through the Execucomp database, which is part of the Compustat database. The Compustat database was also used to gather data necessary to create control variables that indicate the firm's financial performance. Finally, the database BoardEX was used to obtain data needed to generate control variables that concern the characteristics of corporate board members. All the above databases besides Refinitiv, were accessible through the Wharton Research Data Service (WRDS), which is a research platform for global institutions. Subsequently, after collecting all the necessary data, I merged them through the ISIN code, and I dropped all the missing values. The final dataset consists of 6516 observations that concern the companies that belong to the S&P 1500 index for the period 2015-2021.

Table 1 contains the summary statistics of the sample. The range of the ESG scores is from 0 to 100 and since the mean of the dependent variable is 47.175, the median is 45.65, the maximum value is 94.7 and the minimum value is 1.3, it can be inferred that this sample's distribution is quite even between companies with high and low ESG scores. In addition, the mean of the BGD variable is 21.895, which is a low percentage of female directors, indicating that most firms in the sample do not have gender balanced boards. Furthermore, the average number of members on corporate boards is 10 and since the median of the variable board independence is 8.6, it can be inferred that most of them are independent. On top of that, the maximum percentage of independent directors is 100, suggesting that there are companies whose board members are all independent. Regarding the variable board tenure, its maximum value is 30.75 and its minimum value is 0 which suggests that possibly the board of certain companies has just been formed or that there has been a complete turnover in board membership, with all members being newly appointed or selected. Moreover, the average leverage ratio is 0.183 suggesting that the firms included in the sample rely more on equity financing than debt financing and are financially stable. Finally, it is evident from the mean and the median of the variable ROA, which is 0.048 and 0.047 respectively, that these companies are also quite profitable.

Table 1: Summary Statistics

	N	Mean	SD	Min	Median	Max
ESG	6516	47.17541	19.06247	1.3	45.65	94.7
BGD	6516	21.89578	11.1956	0	22.22	50
Board_Size	6516	9.639196	2.097206	5	10	15
Board_Tenure	6516	9.002265	3.873028	0	8.6	30.75
Board_Ind	6516	82.19085	10.34586	25	85.71	100
Board_Age	6516	7.317205	2.157135	3.2	7	13.485
FCF	6516	0.0550098	0.0745548	-0.2538074	0.056432	0.2710049
Firm_Size	6516	8.38602	1.578579	2.496753	8.243901	14.42661
Tobins_Q	6516	2.364378	1.956859	0.4568586	1.762338	27.89637
MV_Equity	6516	3.706825	0.6364805	2.533794	3.621	5.372567
Leverage_Ratio	6516	0.1834787	0.1460657	0	0.1557464	0.6312236
ROA	6516	0.0488366	0.0758932	-0.2458005	0.0471736	0.2830479
CEO_Dual	6516	0.596992	0.49054	0	1	1
CEO_FEMALE	6516	0.0549417	0.2278839	0	0	1

Table 2 contains the correlation matrix of the sample, which is used to identify important associations between the variables. To begin with, it is obvious that a strong positive correlation exists between board gender diversity (BGD) and the ESG performance of the firm (ESG). This positive connection confirms the first hypothesis of this research and is in line with a wide part of previous literature that reported a positive relationship between the two variables. In addition, as the matrix shows, there is a significant but weak negative correlation between board gender diversity (BGD) and the average board age and tenure which indicates that board gender diversity might be reduced when board members have longer tenures or are older. Indeed, in this case the reduced turnover within the board and the more conservative perspectives regarding gender equality, can make it challenging for new members, especially women, to break into the board. Moreover, these corporate governance variables are also negatively associated with the ESG performance of the firm (ESG) which is expected due to the strong positive correlation it has with the board gender diversity (BGD). Finally, concerning the majority of the financial control variables, they are positively associated with board gender

diversity (BGD) and ESG ratings (ESG), as larger, more profitable and financially stable firms tend to have more resources and increased stakeholder pressure that result to better sustainability outcomes. In general, most of the correlation coefficients that are visible in this correlation matrix have values less than 0.5, which indicates that the variables used in the context of this research are not strongly correlated with each other. As a result, there is no multicollinearity between the independent variables used in the regression models.

Table 2: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
[1] ESG	1													
[2] BGD	0.4175***	1												
[3] Board_Size	0.3574***	0.1834***	1											
[4] Board_Tenure	-0.1170***	-0.1518***	-0.0648***	1										
[5] Board_Ind	0.3739***	0.2583***	0.1309***	-0.2016***	1									
[6] Board_Age	-0.2206***	-0.1589***	-0.0430**	0.1469***	-0.2965***	1								
[7] FCF	0.0946***	0.0429***	-0.0094	0.0897***	0.0269*	0.0188	1							
[8] Firm_Size	0.5964***	0.2586***	0.4982***	-0.1019***	0.1965***	-0.1606***	-0.0570***	1						
[9] Tobins_Q	-0.0275*	0.0197	-0.0904***	0.0368**	-0.0149	0.0409***	0.3004***	-0.2467***	1					
[10] MV_Equity	0.5987***	0.2507***	0.4328***	-0.0439***	0.2016***	-0.1316***	0.1863***	0.8206***	0.2097***	1				
[11] Leverage_Ratio	0.0401**	0.0398**	0.1329***	-0.1619***	0.0007	-0.0125	-0.3100***	0.2767***	-0.4214***	-0.1135***	1			
[12] ROA	0.0667***	0.0412***	-0.0027	0.1461***	0.0017	-0.0021	0.7557***	-0.0144	0.3341***	0.2464***	-0.3394***	1		
[13] CEO_Dual	-0.0230	-0.0212	0.0801***	0.2742***	-0.1168***	-0.0074	0.0454***	0.0980***	-0.0057	0.1126***	-0.0008	0.0905***	1	

3.3 Design of the regression analysis

This study is a panel study, as the data used to answer the research question concern numerous firms for several years. Overall, panel data analysis makes use of the advantages of both cross-sectional and time-series data to provide a useful framework for investigating the association between two variables. More specifically, it offers valuable insights about the relationship of interest as it enables researchers to examine its evolution over time. Moreover, thanks to the larger sample size, it has greater statistical power and is more efficient compared to the other methods of data handling. However, there are also certain concerns regarding the analysis of panel data which should not be overlooked during the interpretation of the results. For instance, the possibility of selection bias which prevents the generalization of the findings to the larger population or the assumption of independence between the observations should be carefully considered to avoid being led to biased estimates and conclusions.

In this research, I will use a standard linear regression model with Ordinary Least Square (OLS) estimators. There are certain requirements which should be fulfilled to use this estimation model. One of the most important is the assumption of linear relationship between the dependent and the independent variables. I performed certain tests to examine if this requirement is fulfilled and indeed the results indicated that a linear relationship exists between the two variables. Moreover, there should be no association between the independent variables as it will hinder the interpretation of the individual coefficient estimates. To this end, multicollinearity tests were performed prior to the application of the regression model. Finally, due to the sensitivity of OLS regression to outliers, I winsorized some variables before proceeding to the necessary data analysis.

Therefore, to investigate the association between board gender diversity and the environmental, social and governance performance of the firm, I estimated the following regression equation:

$$ESG_{it} = \alpha + \beta 1 * BGD_{i,t-1} + \theta * CONTROLS_{i,t-1} + \varepsilon_{it}$$

Furthermore, to examine the moderating role that the presence of female CEOs has on the relation between board gender diversity and ESG performance, I also estimated the following regression equation:

$$ESG_{it} = \alpha + \beta 1 * BGD_{i,t-1} + \beta 2 * CEO_FEMALE_{i,t-1} + \beta 3 * BGD_{i,t-1} * CEO_FEMALE_{i,t-1} + \theta * CONTROLS_{i,t-1} + \varepsilon_{it}$$

Where ESG_{it} refers to the environmental, social and corporate governance ratings of the firm and $BGD_{i,t-1}$ is the percentage of female directors on corporate boards. The variable

$CEO_FEMALE_{i,t-1}$ is an indicator variable that equals one if the gender of CEO is female and zero otherwise. In addition, the product $BGD_{i,t-1} * CEO_FEMALE_{i,t-1}$ is an interaction term which captures the moderating effect that the gender of the CEO has on the dependent variable. The vector $CONTROLS_{i,t-1}$ represents all the control variables described in the section 3.1.3. The subscript *i* and *t* refer to the board of directors of company *i* in year *t*. Moreover, to mitigate endogeneity concerns, after conducting a Hausman test, I used fixed effects in the regression. The inclusion of firm fixed effects enables to control for unobservable factors that vary across firms in the panel but do not change over time, capturing in this way heterogeneity among firms. In addition, I included yearly fixed effects to control time-varying factors which are common to all the firms in the sample.

Chapter 4 – Results and Discussion

Table 3 displays the results of the first two regression models. The first model does not include fixed effects, while firm and year fixed effects are added to the second model. In model 1, the coefficient of the BGD variable equals 0.447 and is highly significant ,showing that the association between board gender diversity and corporate ESG performance is positive. Once fixed effects are included in the second model, this coefficient slightly increases (0.471) and its statistical importance remains quite high. The results of both models support the first hypothesis of this paper, which suggests that a positive association exists between board gender diversity and ESG ratings. In addition, in both models all the control variables except for the Tobin's Q ratio (Tobins_Q) have a highly significant impact on the firm's ESG performance. Regarding the second model where the fixed effects are included, the control variables with the largest coefficients are the company's leverage ratio (Leverage_Ratio), the free cash flows (FCF) and the Return on Assets (ROA), with a value of 9.296, 7.998 and -7.058 respectively. Moreover, the R squared of these models is relatively low (0.357), indicating a poor goodness of fit.

Table 3: Regression Analysis: Board gender diversity and ESG ratings

	(1) **ESG**	(2) **ESG**
BGD	**0.447***** **(31.04)**	**0.471***** **(29.23)**
Board_Size	0.324*** (3.42)	0.294*** (2.74)
Board_Tenure	0.354*** (5.96)	0.476*** (6.07)
Board_Ind	0.268*** (14.74)	0.226*** (10.95)
Board_Age	-0.215*** (-2.65)	-0.0632 (-0.70)
FCF	12.13*** (4.33)	7.998*** (2.71)
Firm_Size	3.113*** (7.45)	4.015*** (6.33)
Tobins_Q	-0.114 (-0.93)	0.0556 (0.40)
MV_Equity	8.292*** (8.53)	6.257*** (4.91)
Leverage_Ratio	7.150*** (3.71)	9.296*** (3.61)
ROA	-10.75*** (-4.17)	-7.058*** (-2.63)
CEO_Dual	-3.909*** (-10.04)	-4.631*** (-10.38)
_cons	-45.05*** (-19.43)	-44.39*** (-13.30)
Observations	6516	6516
Fixed effects	no	Yes
R^2		0.357

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

These findings, which are based on 1,500 major, publicly traded companies, indicate that indeed the presence of more women directors possibly enhances the variety of perspectives, talents and experiences during the decision-making process and increases the board's capacity to recognize and handle ESG issues. In this way, they support the previously analyzed organizational theories such as the agency theory, the resource dependence theory and the stakeholder's theory. Furthermore, they are in line with the findings of many previous researchers who have also reported that a positive link exists between the two variables and are in contrast with the viewpoint that these variables are negatively correlated or are not even related at all.

Table 4 contains the results of the third and fourth regression model, which include the interaction term for the variable CEO_FEMALE, that is necessary to examine the second hypothesis of this research. As in the previous table, fixed effects are not included in model 3, but they are added to model 4, to investigate and compare the findings in both cases. The interaction term is used to capture the moderating effect that the gender of the CEO has on the relation between board gender diversity and a firm's ESG ratings. According to the results of the third model, while the connection between board gender diversity and corporate sustainability performance remains positive and significant, the presence of female CEOs does not appear to strengthen it, as it was expected. On the contrary, the coefficient of the interaction term is negative with a value of -0.0394 and is not statistically important. As a result, due to its lack of significance both in economic and in statistical terms, it can be inferred that the appointment of women CEOs does not have an impact on the baseline relationship. Moreover, concerning the fourth model, the results also indicate that the moderating effect of CEO gender is not significant. Even though the coefficient of the interaction term turns positive with a value of 0.0311, its statistical and economic importance remains quite low. Furthermore, it is also important to note that the value of the R squared (0.357) does not improve compared to the first two regression models, showing that the goodness of fit in this case is also relatively law. Finally, the coefficients of the most control variables are highly significant, except for the age of the company board members (Board_Age) in the fourth model.

Table 4: Regression Analysis: The moderating effect of CEO gender

	(1) **ESG**	(2) **ESG**
BGD	0.449***	0.470***
	(31.28)	(28.57)
Board_Size	0.322***	0.296***
	(3.40)	(2.75)
Board_Tenure	0.354***	0.477***
	(5.96)	(6.08)
Board_Ind	0.268***	0.226***
	(14.73)	(10.93)
Board_Age	-0.214***	-0.0641
	(-2.64)	(-0.71)
FCF	12.14***	7.994***
	(4.33)	(2.71)
Firm_Size	3.103***	4.027***
	(7.43)	(6.35)
Tobins_Q	-0.115	0.0567
	(-0.94)	(0.41)
MV_Equity	8.310***	6.228***
	(8.55)	(4.88)
Leverage_Ratio	7.206***	9.207***
	(3.74)	(3.57)
ROA	-10.75***	-7.059***
	(-4.17)	(-2.63)
CEO_Dual	-3.894***	-4.646***
	(-9.98)	(-10.39)
CEO_FEMALE	1.261	-1.197
	(0.66)	(-0.56)
BGD_FEMALE	**-0.0394**	**0.0311**
	(-0.80)	**(0.58)**
_cons	-45.08***	-44.33***
	(-19.44)	(-13.27)
Observations	6516	6516
Fixed effects	no	Yes
R^2		0.357

Standard errors in parentheses
$^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

These models were applied with the aim to extend the existing literature that is related to the interaction between CEO's personal characteristics and the company's ESG ratings. The impact of a factor that has not been previously investigated is examined, but the results turn out to be insignificant. Consequently, no important implications can be made regarding the moderating effect of female CEOs. However, these findings open the way for future research regarding the influence of CEO gender or other CEO individual traits on the firm's sustainability performance.

Chapter 5 – Conclusion

5.1 Summary

Over the past few years, there has been a remarkable increase in demand from stakeholders and investors for gender equality and sustainability within firms. Companies have been kept more accountable for their social and environmental impact and they are trying to gain a competitive edge by increasing the adoption and disclosure of sustainable practices. Moreover, governments worldwide are recognizing the crucial role that businesses play in driving social and environmental progress and they are implementing legislations and regulations that require companies to integrate gender equality and sustainability into their core operations. For instance, many gender quota laws have emerged that require companies to include a minimum number of female directors on their boards. In this context, many researchers have investigated the relation between board gender diversity and the sustainability performance of the firm. However, the findings regarding their association are mixed. As a result, the first scale of this research aims to draw clearer inferences regarding the correlation of the two variables. Moreover, many studies have also reported several factors that significantly moderate this relation. The second part of this research involves the examination of the influence that the gender of a company's CEO has on the association between female representation on boards and the corporate ESG performance. Even though there is plenty of evidence regarding the impact of the CEO's gender on the financial and sustainability performance of the firm, it's role as a moderating factor has not been previously investigated. In summary, the research question of this paper is: *whether a positive association exists between board gender diversity and the ESG performance of the firm and whether the presence of female CEOs strengthens this positive relation*.

To answer this research question, I conducted a panel data analysis using Ordinary Least Square regressions with firm and year fixed effects to mitigate endogeneity concerns. The research sample consists of the companies listed in the S&P 1500 index and the sample period ranges from 2015 to 2021. The sustainability performance of the firms was captured using the environmental, social and governance ratings which were retrieved from the Thomson Reuter's Refinitiv Eikon database. Moreover, the data used to identify the gender of the companies' CEOs were taken from the ExecuComp database and the corporate governance and financial data that were necessary to create the control variables were collected using the databases BoardEX and Compustat respectively.

The empirical tests revealed a significant positive connection between the percentage of women on corporate boards and the firm's environmental, social, and governance performance. As a result, the first hypothesis was confirmed supporting in this way the findings of many previous researchers that had also found a positive association between the two variables. However, regarding the second hypothesis, the results were not statistically or economically meaningful like in the first one. Surprisingly, the presence of female CEOs does not seem to improve the relation between gender diverse boards and ESG ratings as it was expected.

5.2 Implications

The findings of this study have various theoretical implications as they support the organizational theories that were used to formulate the hypothesis of this paper. The positive association that was found between the increased presence of female directors and the firm’s sustainability performance bolsters the resource dependence theory, according to which more diversity on boards multiplies the available resources needed by the firm to survive and develop in the long run. Moreover, the results confirm the claims of the agency theory which suggests that the presence of diverse perspectives within the firm leads to more effective monitoring and governance practices, mitigating in this way the agency problems that might arise. Finally, the reported positive link between gender diverse boards and ESG ratings is also in line with the stakeholder’s theory. It argues that greater diversity on corporate boards raises the possibility that a wider range of stakeholder’s interests and needs will be protected.

In addition, the findings of this study do not have only theoretical implications, but they have several practical consequences as well. The confirmation of the first hypothesis highlights the importance of implementing and promoting board diversity policies within the firms such as quotas for gender representation on boards or specific targets related to the inclusion of females in the decision-making process. Moreover, organizations are motivated to reexamine and change their recruitment and selection processes to ensure a diverse pool of candidates for board positions. Furthermore, companies are encouraged to enhance their transparency regarding the gender composition of their boards or their progress toward diversity goals and their ESG initiatives, as it will lead to better sustainability ratings and outcomes. However, due to the lack of significance in the results of the second hypothesis, no serious practical implications can be drawn regarding the appointment of more female CEOs, as the gender of the CEO was not found to strengthen the sustainability outcomes of the firm.

5.3 Limitations and future research

Despite the important contribution of this study at a theoretical and a practical level, there are also certain limitations that should be discussed. To begin with, there are endogeneity concerns which arise from the possibility that there are unobserved factors that might affect both the levels of gender diversity on corporate boards and the sustainability outcomes of the firms. In this research, I tried to mitigate this issue by including several control variables related to board, CEO or financial characteristics of the firms. Moreover, to this end I conducted my analysis using panel data and I applied fixed effects in the regression models, to control unobserved heterogeneity across the firms in the sample. However, as the mixed findings in the previous literature reveal, the relationship between board gender diversity and ESG performance is quite complex and

can be influenced by many factors which are difficult to control. For instance, leadership values or external events might introduce bias and endogeneity into the analysis. Furthermore, as it can be inferred from the values of the R squared in the regression models, the degree of accuracy of this analysis is relatively low, which leaves room for using different methods to examine the relationship of interest. For instance, the use of another econometric technique such as a difference-in-differences analysis could lead to a model with a better fitting. In addition, as it is already mentioned, the findings regarding the second hypothesis are insignificant. Consequently, further research into this moderating effect is required, as CEO gender is a factor that is proven to be related to the sustainability outcomes of the firm. Moreover, future research can be done regarding the influence of other personal traits of the companies' CEOs in the relation between gender diverse boards and ESG outcomes. Finally, another limitation of this thesis is related to the research sample that was used as it concerns only companies included in the U.S. stock market. It would be quite interesting to repeat this analysis in the European context as well, as it might have led to different results. Many European countries have implemented quota systems or gender diversity mandates, which can lead to increased gender diversity on corporate boards. In contrast, the United States generally rely on voluntary initiatives and disclosure requirements regarding this issue.

References

A. A. Zaid, M., Wang, M., Adib, M., Sahyouni, A., & T. F. Abuhijleh, S. (2020). Boardroom nationality and gender diversity: Implications for corporate sustainability performance. *Journal of Cleaner Production*, *251*. https://doi.org/10.1016/j.jclepro.2019.119652

Aabo, T., & Giorici, I. C. (2022). Do female CEOs matter for ESG scores? *Global Finance Journal*. https://doi.org/10.1016/j.gfj.2022.100722

Adams, R., & Ferreira, D. (2008). *Women in the Boardroom and Their Impact on Governance and Performance*. http://ssrn.com/abstract_id=1107721www.ecgi.org/wpElectroniccopyavailableat:https://ssrn.com/abstract=1107721

Al-Shaer, H., & Zaman, M. (2016). Board gender diversity and sustainability reporting quality. *Journal of Contemporary Accounting and Economics*, *12*(3), 210–222. https://doi.org/10.1016/j.jcae.2016.09.001

Bear, S., Rahman, N., & Post, C. (2010). The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation. *Journal of Business Ethics*, *97*(2), 207–221. https://doi.org/10.1007/s10551-010-0505-2

Bernardi, R. A., Bosco, S. M., & Columb, V. L. (2009). Does female representation on boards of directors associate with the most ethical companies list. *Corporate Reputation Review*, *12*(3), 270–280. https://doi.org/10.1057/crr.2009.15

Birindelli, G., Iannuzzi, A. P., & Savioli, M. (2019). The impact of women leaders on environmental performance: Evidence on gender diversity in banks. *Corporate Social Responsibility and Environmental Management*, *26*(6), 1485–1499. https://doi.org/10.1002/csr.1762

Birindelli, G., Dell'Atti, S., Iannuzzi, A. P., & Savioli, M. (2018). Composition and activity of the board of directors: Impact on ESG performance in the banking system. *Sustainability (Switzerland)*, *10*(12). https://doi.org/10.3390/su10124699

Borghesi, R., Houston, J. F., & Naranjo, A. (2014). Corporate socially responsible investments: CEO altruism, reputation, and shareholder interests. *Journal of Corporate Finance*, *26*, 164–181. https://doi.org/10.1016/j.jcorpfin.2014.03.008

Byron, K., & Post, C. (2016). Women on Boards of Directors and Corporate Social Performance: A Meta-Analysis. *Corporate Governance: An International Review*, *24*(4), 428–442. https://doi.org/10.1111/corg.12165

Campopiano, G., Rinaldi, F. R., Sciascia, S., & de Massis, A. (2019). Family and non-family women on the board of directors: Effects on corporate citizenship behavior in family-controlled fashion firms. *Journal of Cleaner Production*, *214*, 41–51. https://doi.org/10.1016/j.jclepro.2018.12.319

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, *18*(5), 396–414. https://doi.org/10.1111/j.1467-8683.2010.00809.x

Chu, H.-L., Liu, N.-Y., & Chiu, S.-C. (2023). CEO power and CSR: the moderating role of CEO characteristics. *China Accounting and Finance Review*, *25*(1), 101–121. https://doi.org/10.1108/cafr-03-2022-0027

Cordeiro, J. J., Profumo, G., & Tutore, I. (2020). Board gender diversity and corporate environmental performance: The moderating role of family and dual-class majority ownership structures. *Business Strategy and the Environment*, *29*(3), 1127–1144. https://doi.org/10.1002/bse.2421

Cordeiro, J. J., Profumo, G., & Tutore, I. (2021). Family ownership and stockholder reactions to environmental performance disclosure: A test of secondary agency relationships. *Business Strategy and the Environment*, *30*(4), 2091–2107. https://doi.org/10.1002/bse.2734

Cronqvist, H., & Yu, F. (2017). Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics*, *126*(3), 543–562. https://doi.org/10.1016/j.jfineco.2017.09.003

Cucari, N., Esposito De Falco, S., & Orlando, B. (2018). Diversity of Board of Directors and Environmental Social Governance: Evidence from Italian Listed Companies. *Corporate Social Responsibility and Environmental Management*, *25*(3), 250–266. https://doi.org/10.1002/csr.1452

Dang, R., & Rochelle, L. (n.d.). Women On French Corporate Board Of Directors: How Do They Differ From Their Male Counterparts? In *The Journal of Applied Business Research* (Vol. 30, Issue 2).

Dezsö, C. L., & Ross, D. G. (2012). Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal*, *33*(9), 1072–1089. https://doi.org/10.1002/smj.1955

Eagly, A. H., & Johannesen-Schmidt, M. C. (2001). The leadership styles of women and men. *Journal of Social Issues*, *57*(4), 781–797. https://doi.org/10.1111/0022-4537.00241

Faccio, M., Marchica, M.-T., Mura, R., Aretz, K., Bergsma, K., Chaney, P., Denis, D., Denis, D., Durnev, A., Fracasso, A., Goergen, M., Hsu, S., Kaustia, M., Kim, S., Lesmond, D., Li, K., Lyandres, E., Malmendier, U., Michaely, R., … Zhang, F. (n.d.). *CEO Gender, Corporate Risk-Taking, and the Efficiency of Capital Allocation Acknowledgments: We thank an anonymous referee*. http://fortune.com/2014/06/03/number-of-fortune-500-women-ceos-reaches-historic-high/

Gaio, C., & Gonçalves, T. C. (2022). Gender Diversity on the Board and Firms' Corporate Social Responsibility. *International Journal of Financial Studies*, *10*(1). https://doi.org/10.3390/ijfs10010015

Galbreath, J. (2011). Are there gender-related influences on corporate sustainability? A study of women on boards of directors. In *Journal of Management & Organization* (Vol. 17, Issue 1).

Gallego-Álvarez, I., García-Sánchez, I. M., & Rodríguez-Dominguez, L. (2010). The influence of gender diversity on corporate performance. *Revista de Contabilidad-Spanish Accounting Review*, *13*(1), 53–88. https://doi.org/10.1016/S1138-4891(10)70012-1

Glass, C., Cook, A., & Ingersoll, A. R. (2016). Do Women Leaders Promote Sustainability? Analyzing the Effect of Corporate Governance Composition on Environmental Performance. *Business Strategy and the Environment*, *25*(7), 495–511. https://doi.org/10.1002/bse.1879

Gonçalves, T. C., Gaio, C., & Rodrigues, M. (2022). The Impact of Women Power on Firm Value. *Administrative Sciences*, *12*(3). https://doi.org/10.3390/admsci12030093

Harjoto, M., Laksmana, I., & Lee, R. (2015). Board Diversity and Corporate Social Responsibility. *Journal of Business Ethics*, *132*(4), 641–660. https://doi.org/10.1007/s10551-014-2343-0

Hassan, M., & Imtiaz, M. (n.d.). *Board Gender Diversity and Environmental, Social & Governance Performance of US Banks: Moderating role of Environmental Social and Corporate Controversies*. http://shura.shu.ac.uk/27475/

Hillman, A. J., & Dalziel, T. (2003). Boards of Directors and Firm Performance: Integrating Agency and Resource Dependence Perspectives. In *Source: The Academy of Management Review* (Vol. 28, Issue 3). https://www.jstor.org/stable/30040728
Hoobler, J. M., Masterson, C. R., Nkomo, S. M., & Michel, E. J. (2018). The Business Case for Women Leaders: Meta-Analysis, Research Critique, and Path Forward. *Journal of Management*, *44*(6), 2473–2499. https://doi.org/10.1177/0149206316628643

Hossain, M., al Farooque, O., Momin, M. A., & Almotairy, O. (2017). Women in the boardroom and their impact on climate change related disclosure. *Social Responsibility Journal*, *13*(4), 828–855. https://doi.org/10.1108/SRJ-11-2016-0208

Huang, S. K. (2013). The impact of CEO characteristics on corporate sustainable development. *Corporate Social Responsibility and Environmental Management*, *20*(4), 234–244. https://doi.org/10.1002/csr.1295

Huang, J., & Lu, S. (2022). *ESG Performance and Voluntary ESG Disclosure: Mind the (Gender Pay) Gap *.*

Husted, B. W., & Sousa-Filho, J. M. de. (2019). Board structure and environmental, social, and governance disclosure in Latin America. *Journal of Business Research*, *102*, 220–227. https://doi.org/10.1016/j.jbusres.2018.01.017

Isah, N., & Iliya, R. (n.d.). *The Effect of Corporate Gender Diversity on Board and Firm Performance*. https://ssrn.com/abstract=3304354

Khan, W. A., & Vieito, J. P. (2013). Ceo gender and firm performance. *Journal of Economics and Business*, *67*, 55–66. https://doi.org/10.1016/j.jeconbus.2013.01.003

Kish-Gephart, J. J., Harrison, D. A., & Treviño, L. K. (2010). Bad Apples, Bad Cases, and Bad Barrels: Meta-Analytic Evidence About Sources of Unethical Decisions at Work. *Journal of Applied Psychology*, *95*(1), 1–31. https://doi.org/10.1037/a0017103

KONRAD, A. M., KRAMER, V., & ERKUT, S. (2008). Critical Mass:. The Impact of Three or More Women on Corporate Boards. *Organizational Dynamics*, *37*(2), 145–164. https://doi.org/10.1016/j.orgdyn.2008.02.005

Li, J., Zhao, F., Chen, S., Jiang, W., Liu, T., & Shi, S. (2017). Gender Diversity on Boards and Firms' Environmental Policy. *Business Strategy and the Environment*, *26*(3), 306–315. https://doi.org/10.1002/bse.1918

Lim, M. H., & Chung, J. Y. (2021). The effects of female chief executive officers on corporate social responsibility. *Managerial and Decision Economics*, *42*(5), 1235–1247. https://doi.org/10.1002/mde.3304

Liu, C. (2018). Are women greener? Corporate gender diversity and environmental violations. *Journal of Corporate Finance*, *52*, 118–142. https://doi.org/10.1016/j.jcorpfin.2018.08.004

Liu, C. (2021). CEO gender and employee relations: Evidence from labor lawsuits. *Journal of Banking and Finance*, *128*. https://doi.org/10.1016/j.jbankfin.2021.106136

Malik, F., Wang, F., Naseem, M. A., Ikram, A., & Ali, S. (2020). Determinants of Corporate Social Responsibility Related to CEO Attributes: An Empirical Study. *SAGE Open*, *10*(1). https://doi.org/10.1177/2158244019899093

Manita, R., Bruna, M. G., Dang, R., & Houanti, L. (2018). Board gender diversity and ESG disclosure: evidence from the USA. *Journal of Applied Accounting Research*, *19*(2), 206–224. https://doi.org/10.1108/JAAR-01-2017-0024

Manner, M. H. (2010). The Impact of CEO Characteristics on Corporate Social Performance. *Journal of Business Ethics*, *93*(SUPPL. 1), 53–72. https://doi.org/10.1007/s10551-010-0626-7

Menicucci, E., & Paolucci, G. (2022). Board Diversity and ESG Performance: Evidence from the Italian Banking Sector. *Sustainability (Switzerland)*, *14*(20). https://doi.org/10.3390/su142013447

Nadeem, M., Bahadar, S., Gull, A. A., & Iqbal, U. (2020). Are women eco-friendly? Board gender diversity and environmental innovation. *Business Strategy and the Environment*, *29*(8), 3146–3161. https://doi.org/10.1002/bse.2563

Navarro-García, J. C., Ramón-Llorens, M. C., & García-Meca, E. (2022). Female directors and corporate reputation. *BRQ Business Research Quarterly*, *25*(4), 352–365. https://doi.org/10.1177/2340944420972717

Naveed, K., Voinea, C. L., Ali, Z., Rauf, F., & Fratostiteanu, C. (2021). Board gender diversity and corporate social performance in different industry groups: Evidence from China. *Sustainability (Switzerland)*, *13*(6). https://doi.org/10.3390/su13063142

Peng, X. U. (2015). *Risk Taking and Firm Growth*. http://www.rieti.go.jp/en/

Prado-Lorenzo, J. M., Gallego-Alvarez, I., & Garcia-Sanchez, I. M. (2009). Stakeholder engagement and corporate social responsibility reporting: The ownership structure effect. *Corporate Social Responsibility and Environmental Management*, *16*(2), 94–107. https://doi.org/10.1002/csr.189

Provasi, R., & Harasheh, M. (2021). Gender diversity and corporate performance: Emphasis on sustainability performance. *Corporate Social Responsibility and Environmental Management*, *28*(1), 127–137. https://doi.org/10.1002/csr.2037

Reddy, S., & Jadhav, A. M. (2019). Gender diversity in boardrooms–A literature review. In *Cogent Economics and Finance* (Vol. 7, Issue 1). Cogent OA. https://doi.org/10.1080/23322039.2019.1644703

Rodriguez-Dominguez, L., Gallego-Alvarez, I., & Garcia-Sanchez, I. M. (2009). Corporate governance and codes of ethics. *Journal of Business Ethics*, *90*(2), 187–202. https://doi.org/10.1007/s10551-009-0035-y

Romano, M., Cirillo, A., Favino, C., & Netti, A. (2020). ESG (Environmental, social and governance) performance and board gender diversity: The moderating role of CEO duality. *Sustainability (Switzerland)*, *12*(21), 1–16. https://doi.org/10.3390/su12219298

Smith, N., Smith, V., & Verner, M. (2006). Do women in top management affect firm performance? A panel study of 2,500 Danish firms. In *International Journal of Productivity and Performance Management* (Vol. 55, Issue 7, pp. 569–593). https://doi.org/10.1108/17410400610702160

Smith, N., Smith, V., & Verner, M. (2008). *Women in top management and firm performance*.

Spencer, S. M., Blazek, E. S., & Orr, J. E. (2019). Bolstering the female CEO pipeline: Equalizing the playing field and igniting women's potential as top-level leaders. *Business Horizons*, *62*(5), 567–577. https://doi.org/10.1016/j.bushor.2018.10.001

Theis, J., & Nipper, M. (2021). The Impact of Executives' Gender, Financial Incentives, and Shareholder Pressure on Corporate Social and Ecological Investments. *Schmalenbach Journal of Business Research*, *73*(3–4), 307–338. https://doi.org/10.1007/s41471-021-00122-8

Tran, N. M., & Pham, B. N. T. (2020). The influence of CEO characteristics on corporate environmental performance of SMEs: Evidence from Vietnamese SMEs. *Management Science Letters*, *10*(8), 1671–1682. https://doi.org/10.5267/j.msl.2020.1.013

Ullah, I., Fang, H., & Jebran, K. (2020). Do gender diversity and CEO gender enhance firm's value? Evidence from an emerging economy. *Corporate Governance (Bingley)*, *20*(1), 44–66. https://doi.org/10.1108/CG-03-2019-0085