

The impact of sustainability (ESG) disclosure and board diversity on firm value: The moderating role of industry sensitivity.

Abstract

Using a large panel dataset comprising 812 listed European firms, this study investigates whether sustainability disclosure (Environmental, Social, and Governance) and female representation on boards affect firm value. We observe a positive impact of sustainability disclosure and board gender diversity on firm value, suggesting that the best management practices, enhanced stakeholder trust, and female representation on boards improve firm value. We observe that the firms in sensitive industries achieve superior social and governance performance. We also observe that the firms with higher female representation on their boards present significantly superior environmental, social, and governance performance. Our results are robust to different firm and country specific control variables and to year and country fixed effects.

Keywords: *Sustainability Disclosure, ESG, Board Gender Diversity, Value Relevance, Stock Prices, Shareholder Theory, Stakeholder Theory.*

JEL Classification: *C23, G03, M14, Q01.*

1. Introduction

The United Nations developed the UN Environmental Program (UNEP) at a conference in Stockholm¹ in 1972 to encourage society and businesses to take action regarding world issues relating to the environment, poverty and human rights. In 1983, the General Assembly established a special commission to prepare a report regarding global environmental problems, and proposed strategies for sustainable development². In 1987, the term “sustainable development” was stated in a published report of the World Commission on Environment and Development³ for the first time. The purpose of the commission, which is also known as the Brundtland Commission, is to educate and inspire a new way of thinking on poverty and environmental issues. In 1992, at the Earth Summit⁴, more than 178 countries adopted a comprehensive plan of action to build a global partnership for sustainable development to improve human lives and protect the environment. Later, in 2015, the UN introduced the UN Sustainable Development Goals (UNSDG). These goals are related to poverty, inequality, climate, environmental degradation, prosperity, peace and justice. Their aim is to produce a better sustainable future for all stakeholders in society by 2030⁵. The UNSDG has provided a decision-making framework to investors and corporations for their investments, strategies, and management. The development of the UNSDG has increased the focus on sustainability in Europe. The European Union (EU) agreed with the UN in 2015 to set an agenda towards a sustainable Europe by 2030 for all EU member countries and institutions including all stakeholders and public authorities.

The Global Reporting Initiative (GRI) pioneered sustainability reporting in 1997⁶. The GRI provides a set of standards on how organizations can report their economic, environmental and social impacts. The purpose of reporting these standards is to provide reliable information to the stakeholders about an organization’s impacts and contributions to sustainable development. The GRI divides the reporting standards in two sets: the universal standards, and the top-specific standards (Environmental, Social and Governance reports). The universal standards provide the foundation and starting point for using the GRI standards, and the top-specific standards provide specific disclosure rules for each of the individual ESG

¹ <https://sustainabledevelopment.un.org/milestones/humanenvironment>

² <https://sustainabledevelopment.un.org/milestones/wced>

³ https://www.un.org/qa/search/view_doc.asp?symbol=A/42/427&Langq=E

⁴ <https://sustainabledevelopment.un.org/milestones/unced>

⁵ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

⁶ <https://www.globalreporting.org/information/about-gri/Pages/default.aspx>

(Environmental, Social, and Governance) factors. All of these steps that have been taken by the UN and the guidelines that have been provided by the GRI have increased the international focus on sustainability reporting and put pressure on corporations to play their roles in sustainable development and to disclose them in their financial reports. Consequently, ESG disclosure rating agencies have emerged that provide reliable data about the ESG performance of the firms (Avetisyan & Hockerts, 2017).

The core objective of profit making organizations, on the other hand, is to optimize their firm value (Brealey, Myers, Allen, & Mohanty, 2012). The spending that is carried out by firms for sustainable development may reduce the profits of the firms and, consequently, may decrease the firm value. Accordingly, it is important to investigate the impacts of sustainability disclosure on firm value. Since sustainability or ESG (Environmental, Social, and Governance) reporting falls under the umbrella of corporate social responsibility, the empirical studies that have been carried out in the related field can be traced back to the beginning of the 1970s (Friede, Busch, & Bassen, 2015). However, the recent focus of empirical studies on different financial markets is specifically to investigate the impacts of ESG reporting. For example, a study by Ashwin Kumar et al. (2016) investigated the impacts of ESG disclosure on the stock returns of 157 firms that were listed on the Dow Jones and found that the firms incorporating Environmental, Social, and Governance factors had less volatile stock returns compared to their competitors in the same industry. Husted and de Sousa-Filho (2017) investigated the impacts of sustainability governance and country risk on the ESG performance on 459 firms from 9 countries and found that all types of sustainability governance improve ESG performance. Lokuwaduge and Heenetigala (2017) explored the extent of ESG reporting in the mining and metal sector firms that are listed in the Australian Securities Exchange and found that ESG reporting is highly influenced by the reporting regulations. Mervelskemper and Streit (2017) investigated the effectiveness of a firm's ESG reporting strategy and found that ESG reporting strongly influenced perceived ESG performance. Li, Gong, Zhang, and Koh (2018) investigated the impact of ESG performance on 350 FTSE listed firms and found a positive impact of ESG performance on firm value. Buallay (2019) investigated the impact of ESG reporting on the performance of 235 European banks and found a positive impact of ESG disclosure on bank performance.

To the best of the authors' knowledge, none of the previous significant studies investigated the impact of sustainability disclosure (ESG) on the performance or value of the financial and

non-financial listed firms in European economies. European economies are considered to be the leading economies advocating sustainable development (Buallay, 2019). Accordingly, this study extends the literature regarding stakeholders' theory (Freeman, 1984; Jones, 1995; Waddock & Graves, 1997) and sustainability (ESG) disclosure by investigating the impact of sustainability (ESG) disclosure on the value of European listed firms. The study collects data of 812 listed firms⁷ in 22 European countries and applies regression analysis that controls for year and country fixed effects. The study contributes to the literature in several aspects. First, the study investigates the impact of sustainably disclosure (ESG) on the value of European listed firms. Second, the study investigates the moderating role of industry sensitivity on the relationship of sustainably (ESG) disclosure and firm value. Third, the study investigates the impact of board gender diversity on the value of European listed firms. Fourth, the study investigates the impact of board gender diversity on sustainability (ESG) disclosure of European listed firms. The results of the study support stakeholders' theory and explain that sustainability (ESG) disclosure by European listed firms enhances their firm value. The results also explain that increased representation of female directors on boards increases firm value. Further, we observe increased significance of ESG disclosure on firm value for environmentally sensitive industries. We also observe that firms in sensitive industries present better social and governance performance, while the firms with more female directors on their boards present better environmental, social, and governance performance. To ensure that our results are not dominated by one single country and year, we control for year and country fixed effects. Furthermore, to ensure that our results are not dominated by firm-specific factors, we control for a number of time-varying firm-specific variables. Our results are robust to different institutional settings in Europe.

The study is organized in five sections. In section 2, we develop the theoretical framework. In section 3, we describe our data and the methodology. The results are presented in section 4, and section 5 provides conclusions and policy implications. The references are at the end.

2. Theoretical Framework

The shareholder and stakeholder theories are two opposing corporate theoretic frameworks. Shareholder theory states that corporations' only responsibility is maximizing shareholders' value (Friedman, 1970). If a corporation's engagement in social activities negatively affects

⁷ The 812 firms include financial and non-financial firms from 16 different industries.

the value creation for shareholders, it will violate their core responsibility. Friedman (1970) further argues that the managers who spend money on behalf of businesses should only act in the interests of the shareholders and that spending money on social activities is a violation of their duty. On the other hand, stakeholder theory states that corporations have a responsibility towards all their stakeholders, and it describes stakeholders as employees, customers and suppliers, shareholders, government, environmentalists and other groups or individuals who are affected by a corporation (Freeman, 2010). Stakeholder theory suggests that a corporation that is involved in activities beyond profit maximization will consequently be rewarded with value creation for the firm and its stakeholders. Further, the literature defines corporate social responsibility (CSR) as a framework that considers social aspects such as environmental protection, employees' welfare, community programs, and transparent processes (Goergen, 2012). These activities go beyond the normal scope of corporate activities. Sustainability development and ESG (Environmental, Social, and Governance) disclosure are considered as the new trends under the umbrella of CSR (Buallay, 2019; Lokuwaduge & Heenetigala, 2017; Mervelskemper & Streit, 2017). Accordingly, shareholder theory opposes sustainability or ESG disclosure while stakeholder theory supports sustainability or ESG disclosure.

Elkington (1994) introduces the sustainability framework as the "triple bottom line" and explains how corporations can achieve sustainable development by integrating the economic, social, and environmental aspects of their business. Elkington (1994) argues that corporations need to play an active role in achieving sustainable development goals because focusing on sustainable strategies can improve their profits, their customers, and the environment, which will be a "win-win-win" strategy. Porter and Kramer (2002) discuss how social improvements related to a corporation's business can lead to competitive advantages and economic benefits for the company. They explain that social and economic goals are fundamentally connected. They also state that one of the most effective methods for dealing with world issues is in fact to mobilize corporations in ways that benefit both society and the company. According to Porter and Kramer (2002), a company can achieve higher economic benefits when they use their resources efficiently and produce goods that consumers value. This is in line with stakeholder theory, where companies create value by becoming more socially responsible and gaining a competitive advantage.

On the other hand, Barnea and Rubin (2010) argue that overinvesting and commitments to sustainability can create conflicts among shareholders because it reduces shareholders' wealth and firm value, which is in line with shareholder theory. However, most of empirical evidence favors stakeholder theory; for example, Schadewitz and Niskala (2010) explain that sustainability reporting is one of the significant explanatory factors of Finnish firms' market value during the years from 2002-2005. De Klerk, de Villiers, and van Staden (2015) find that CSR disclosure has a positive association with share prices in the United Kingdom. Miralles-Quirós, Miralles-Quirós, and Valente Gonçalves (2018) define sustainability using three pillars (Environmental, Social, and Governance) and explain that the Brazilian market positively values the three ESG pillars. Another study supports an overall positive impact of ESG disclosure on bank performance in Europe; however, it finds mixed results for individual ESG pillars (Buallay, 2019). Following the reasoning of stakeholder theory and in the light of the empirical evidence, we develop our first hypothesis:

H1. There is a positive association between sustainability (ESG) disclosure and the market value of European firms.

A firm's focus on different ESG pillars may differ according to the business type, operating environment, and management's preferences (Friede et al., 2015). Today, the environmental factor is frequently highlighted as the most pressing issue since climate change is something that affects people all over the globe. The Paris Agreement⁸ is one of the significant steps regarding the global response to the threat of climate change. Carroll (1979) suggested that the core responsibility of a corporation is to meet consumers' needs and preferences in society. Since the world is changing, so are consumer preferences. Therefore, it is becoming vital to run more environmentally friendly businesses. Further, our sample firms consist of European firms, and European economies have a very high social and moral development indexes⁹, especially those of the Scandinavian region (Qureshi, Ahsan, Aziz, & Yousaf, 2019). Europe is considered as the leading region in regard to the implementation of human rights. Furthermore, the empirical evidence regarding the three pillars of ESG disclosure provides different results for different dimensions. For example, an empirical study that was carried out by Ziegler, Schröder, and Rennings (2007) finds that environmental performance has a positive effect, while social performance has a negative effect on firm value. Another study

⁸ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

⁹ <http://www.humantruth.info/europe.html>

that was carried out for the European banking sector finds a highly significant impact of environmental and social disclosure on market performance and no impact of governance disclosure on market performance (Buallay, 2019). Considering that our sample dataset encompasses Europe and the results of previous empirical studies, we develop our second hypothesis:

H2. Environmental and Social disclosures are more relevant for the value of European firms than Governance disclosure.

Further, previous empirical evidence states that the impact of ESG disclosure can differ between the firms operating in environmentally sensitive industries and non-sensitive industries because of their operating activities (De Klerk et al., 2015; Garcia, Mendes-Da-Silva, & Orsato, 2017; Miralles-Quirós et al., 2018). Environmentally sensitive firms are the corporations operating within the social contact or that are more visible. The ESG disclosure effect on valuation can be more significant for the firms operating in the industries that are more likely to be exposed to environmental issues; therefore the ESG requirements are higher for the firms in sensitive industries (Miralles-Quirós et al., 2018). Garcia et al. (2017) study sensitive industries in depth and find that the firms operating in these industries tend to have higher overall ESG scores because the firms bear a higher risk. Accordingly, we develop our third hypothesis:

H3. The association between sustainability (ESG) disclosure and market value is stronger among the European firms operating in sensitive industries.

Moreover, the international focus and social debates on gender equality make it an important topic today. Following the lead of Norway in 2003 (Strøm, 2019), many European countries mandated gender quotas of between 30% and 40% to tackle the underrepresentation of women on boards. Consequently, many firms have to change the structure of their boards to increase board gender diversity and the female presence on their boards. The previous research on board gender diversity and ESG provides some conflicting results on how board gender diversity might affect company performance. Rose (2007) finds that there is no association between board diversity and the performance of Danish firms. Adams and Ferreira (2009) find that females on boards impact firms' performance since they are better monitors and have better attendance. According to Bear, Rahman, and Post (2010), a female presence on the board affects a firm's reputation and financial performance; hence, the firm achieves

higher CSR-ratings. Cucari, Esposito De Falco, and Orlando (2018) find that a female presence on the boards of Italian listed firms has a negative effect on ESG disclosure. Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018) find a U-shaped association between board gender diversity and ESG performance in the Banking system. Our aim is to investigate the impacts of board gender diversity on the firm value and sustainability (ESG) disclosure of European firms; therefore, we develop our fourth and fifth hypothesis as follows:

H4. There is a positive association between a female presence on the board and the market value of European firms, and

H5. There is a positive association between a female presence on the board and the sustainability (ESG) disclosure of European firms.

3. Data, variables, and methodology

3.1. Data

We use the Thomson Reuters Eikon database to collect our sample dataset because it provides the ESG disclosure indexes for the firms and it is widely used by researchers and analysts. We use two criteria for the selection of the firms. First, we include firms with headquarters in Europe. Second, we include firms with ESG disclosure scores that were reported during the sample period. After screening, we are left with 812 firms and 5,684 firm-year observations during the period from 2011 to 2017 from 22 European countries (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). We collect the data for the country level variables from the World Bank Database¹⁰. These 812 listed firms cover 16 different industries, including Accommodations and Food Services; Administrative and Support and Waste Management and Remediation Services; Arts, Entertainment, and Recreation; Construction; Finance and Insurance; Health Care and Social Assistance; Information; Manufacturing; Mining, Quarrying, and Oil and Gas Extraction; Other Services (except Public Administration); Professional, Scientific, and Technical Services; Real Estate and Rental and Leasing; Retail Trade; Transportation and Warehousing; Utilities; and Wholesale Trade. Table 1 summarizes the dependent and independent variables along with their measurement proxies.

[Insert Table 1 Here]

3.2. Methodology

¹⁰ <https://www.worldbank.org/>

In this study, we propose using the benchmark price model of Ohlson (1995) to measure firm value. Some of the previous empirical studies use return models (changes in monthly stock returns) to measure stock performance (Ashwin Kumar et al., 2016; Ziegler et al., 2007). Using a return model is appropriate when the objective of the study is to investigate changes in stock returns. However, the objective of this study is to investigate the impacts of ESG disclosure and board gender diversity on firm value; therefore, Ohlson's price model is appropriate for this study (De Klerk et al., 2015). Ohlson (1995) explains that a company's market value is a function of both financial information and non-financial information. This makes the model useful and relevant for our study since we want to investigate the value relevance of ESG disclosure and board gender diversity (BGD_{it}) as the non-financial information and we use the book value per share ($BVPS_{it}$) and earnings per share (EPS_{it}) as the financial information in our basic regression model. Ohlson's price model has been used by many empirical studies in related fields (De Klerk et al., 2015; Hassel, Nilsson, & Nyquist, 2005; Kaspereit & Lopatta, 2016; Miralles-Quirós et al., 2018; Schadewitz & Niskala, 2010). Our baseline valuation model is presented as follows:

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 ESG_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (1)$$

where P_{it} is stock price of firm i at time t . EPS_{it} is the earnings per share of firm i at time t , $BVPS_{it}$ is the book value per share of firm i at time t , ESG_{it} is one of the three measures of disclosure (Environmental, Social, and Governance) of firm i at time t , α_i is the country fixed effects, μ_t is the time fixed effects, and ε_{it} is the error term for firm i at time t .

We further extend our model to investigate whether ESG disclosure is associated with higher stock prices for the firms operating in sensitive industries. We identify the manufacturing, construction, transportation and warehousing, mining, quarrying, oil and gas extraction and administrative, waste management and remediation services sectors as the sensitive industries in our dataset. The selection is based on the NAICS (North American Industry Classification System) sector codes; these industries are identified as environmentally sensitive industries. We present our second model as follows:

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 ESG_{it} + \beta_4 ESG_{it} * D_Sens_i + \alpha_i + \mu_t + \varepsilon_{it} \quad (2)$$

where $ESG_{it} * D_Sens_i$ is the dummy interaction of the industry's sensitivity with one of the three measure of ESG disclosure (Environmental, Social, and Governance) of firm i at time t .

We further extend our model to control for firm specific time-varying variables and present our third model as follows:

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 ESG_{it} + \beta_4 SZ_{it} + \beta_5 LV_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (3)$$

where SZ_{it} is the natural logarithm of the total assets of firm i at time t , and LV_{it} is the ratio of long-term debt over equity of firm i at time t .

We also control for country specific time-varying variables in our model and present our fourth model as follows:

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 ESG_{it} + \beta_4 SZ_{it} + \beta_5 LV_{it} + \beta_6 CNT_{jt} + \mu_t + \varepsilon_{it} \quad (4)$$

where CNT_{jt} is one of the four country specific time varying factors (annual inflation rate, annual per capita GDP growth, banking development, and stock market development) of country j at time t , μ_t is the time fixed effects, and ε_{it} is the error term for firm i at time t .

To investigate the impact of board gender diversity on the market value of European firms (hypothesis-4), we develop the following regression model:

$$P_{it} = \beta_0 + \beta_1 BGD_{it} + \beta_2 EPS_{it} + \beta_3 BVPS_{it} + \beta_4 SZ_{it} + \beta_5 LV_{it} + \beta_6 CNT_{jt} + \alpha_i + \mu_t + \varepsilon_{it} \quad (5)$$

where P_{it} is the stock price of firm i at time t . BGD_{it} is the ratio of female directors on the board of firm i at time t , EPS_{it} is the earnings per share of firm i at time t , $BVPS_{it}$ is the book value per share of firm i at time t , SZ_{it} is the natural logarithm of total assets of firm i at time t , LV_{it} is the ratio of long-term debt over equity of firm i at time t , CNT_{jt} is one of the four country specific time varying factors (annual inflation rate, annual per capita GDP growth, banking development, and stock market development) of country j at time t , α_i is the country fixed effects, μ_t is the time fixed effects, and ε_{it} is the error term for firm i at time t .

Further, to investigate the impact of board gender diversity on the sustainability (ESG) disclosure of European firms (hypothesis-5), we develop the following regression model:

$$ESG_{it} = \beta_0 + \beta_1 BGD_{it} + \beta_2 EPS_{it} + \beta_3 BVPS_{it} + \beta_4 SZ_{it} + \beta_5 LV_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (6)$$

where ESG_{it} is one of the three measure of sustainability disclosure (Environmental, Social, and Governance) of firm i at time t . BGD_{it} is the ratio of female directors on the board of firm i at time t , EPS_{it} is the earnings per share of firm i at time t , $BVPS_{it}$ is the book value per share of firm i at time t , SZ_{it} is the natural logarithm of total assets of firm i at time t , LV_{it} is the ratio of long-term debt over equity of firm i at time t , α_i is the country fixed effects, μ_t is the time fixed effects, and ε_{it} is the error term for firm i at time t .

3.3. Robustness and diagnostics

To investigate the robustness of our analysis, we perform several diagnostic tests. First, we investigate the multicollinearity problem by calculating the variation inflation factor (VIF). We find a VIF of less than 10 for all of our regression models (Table 2); therefore, our models are robust for multicollinearity (Ott & Longnecker, 2015). Second, we carry out the Breusch-Pagan and Cook-Weisberg tests for heteroskedasticity and use robust standard errors as a remedy (Baltagi, 2008). Third, we control firm size and leverage in our regression models, and the results of our main explanatory variables stay the same. Fourth, along with firm level control variables (firm size and leverage), we control for the country level time varying economic (annual inflation rate and annual per capita GDP growth), institutional (banking development and stock market development) factors in our regression models, and the results of our main explanatory variables stay the same.

[Insert Table 2 Here]

4. Results and discussion

4.1. Descriptive statistics

Table 3 (Panel A) presents the descriptive statistics of our dependent, explanatory, and control variables for the complete dataset from 22 European countries comprising 812 firms and 5,684 firm-year observations. The mean value for the stock price (P_{it}) of European firms is 261.648 with a standard deviation of 356.339 and the mean of book value per share ($BVPS_{it}$) is 143.855, showing that the market value of European firms is much higher than their book value. The mean ESG_{it} disclosure score for European firms in our sample is 59.552 and it ranges from 26.716 to 86.143. This result shows that there is a large variation in the best ESG

performing and worst ESG performing firms. For the individual ESG factors, the mean environmental (E_{it}) disclosure is 64.590, the mean social (S_{it}) disclosure is 61.470, and the mean governance (G_{it}) disclosure is 51.763. Board gender diversity (BGD_{it}) has a mean percentage of 20.672 with a maximum of 45.455% and a minimum of zero. The mean firm size (SZ_{it}) is 24.774 and the mean leverage (LV_{it}) is 0.818. The maximum value of 3.811 for LV_{it} represents a high leverage ratio for some European firms; however, these high ratios are for financial firms; therefore, they are quite normal. Further, there are 4,319 firm-year observations for LV_{it} due to the many missing values for the firms in our sample, especially for the firms operating in Malta.

Panel B of Table 3 presents the results of the mean comparison T-test that was carried out to investigate the sustainability (ESG) disclosure performances for different categories. The mean difference of industry sensitivity explains that the firms in sensitive industries have higher social, governance and overall ESG disclosure scores compared to the firms operating in less sensitive industries. This finding suggests that the regulatory frameworks or constraints that are present in the sectoral environments do additionally affect the corporate response to sustainability compliance, which is considered to be essential by society. The mean difference in the female presence on corporate boards explains that the firms with a female presence on their board have very high disclosure scores for all three dimensions of sustainability or ESG compared to firms with no female on their board. These results favor hypothesis 5 of the study, i.e., there is a positive association between a female presence on boards and the sustainability (ESG) disclosure of European firms. The mean differences in firm size and leverage explain that bigger firms have higher disclosure scores for all three dimensions of sustainability (ESG) compared to smaller firms, and highly leveraged firms have higher environmental and social disclosure scores compared to less leveraged firms. This finding indicates that bigger and levered firms are potentially more visible and subject to monitoring by many stakeholders, including creditors, leading such firms to be more responsive to ESG compliance. Further, the mean differences in inflation and economic growth explain that the firms perform better on environmental and social disclosures during low inflationary periods and perform better on social and governance disclosures during high economic growth periods. This finding highlights the intertwined nature of economic factors and the ESG performance of the European firms. Furthermore, the mean difference in banking and stock market development support that the firms operating in lowly developed banking and stock

market environments perform better on environmental and social disclosures while the firms operating in highly developed banking and stock market environments perform better on governance disclosure.

[Insert Table 3 Here]

Table 4 presents the mean values for the respective dependent, explanatory, and control variables for the 22 European countries. The table also explains that the United Kingdom has the most firms (266) and firm-year observations (1862) in our sample dataset. It also explains that French firms have the highest environmental disclosure score (77.39), and a firm from Cyprus has the highest social (84.45) and governance (57.14) disclosure scores. Further, the table shows that Norwegian firms have the highest ratio of female directors on their boards (40.84), and the firms operating in different European countries are almost the same size on average.

[Insert Table 4 Here]

4.2. The impact of sustainability (ESG) disclosure on firm value

Table 5 presents the results of the regression analysis for equation (1). In this analysis, we include different dimensions of sustainability (ESG) disclosure one by one and then add board gender diversity in addition to the financial variables ($BVPS_{it}$ and EPS_{it}) to examine the value relevance of ESG and board gender diversity. In Table 5, both β_1 and β_2 are statistically significant at the 1% level in all the models (1-5), supporting that increases in current financial performance (EPS_{it}) and cumulative past financial performance ($BVPS_{it}$) increase the market value of European firms. The coefficients of $BVPS_{it}$ and EPS_{it} imply that the price is more sensitive to changes in earnings than changes in the book value per share. Further, we observe a positive association of environmental (E_{it}), social (S_{it}), and combined ESG_{it} disclosures with stock prices (models 2, 3, and 5), explaining that increased environmental, social, and sustainability (ESG_{it}) disclosures increase the market value of European firms. These results support our hypothesis 1, i.e., there is a positive association between sustainability (ESG) disclosure and the market value of European firms. Further, we observe a positive but insignificant association between governance (G_{it}) disclosure and the stock price (model 4), explaining that the governance disclosures by European firms do not have a significant impact of the value of European firms. These results potentially indicate that the governance frameworks that operate in the European corporate arena are already stringent enough that these firms are otherwise expected to be compliant with those requirements; thus, a

disclosure (to that effect) may not provide any additional information for the market to have an effect on the price. Our argument is further supported by Table 4, which shows that governance (G_{it}) disclosure is clustered around 50 with a quite low variation observed for different countries. Further, these results support our hypothesis 2; i.e., environmental and social disclosures are more value relevant for European firms than governance disclosures.

[Insert Table 5 Here]

4.3. Sustainability (ESG) disclosure and Industry Sensitivity

Table 6 presents the results of the regression analysis for equation (2). In this analysis, we add a dummy interaction for environmentally sensitive industries with three ESG dimensions and a combined ESG disclosure score. Model 1 includes earnings per share (EPS_{it}), book value per share ($BVPS_{it}$), environmental disclosure (E_{it}), and the dummy interaction of environmental disclosure with sensitive industries ($E_{it} \times \text{Sensitive industries}$). We observe a positive association of environmental disclosure (E_{it}) with firm value at the 5% significance level, and introducing the dummy interaction of environmental disclosure with sensitive industries ($E_{it} \times \text{Sensitive industries}$) increases the significance level to 1%. These relationships support hypothesis 3; i.e., the association between sustainability (ESG) disclosure and market value is stronger among the European firms operating within sensitive industries. Model 2 includes earnings per share (EPS_{it}), book value per share ($BVPS_{it}$), social disclosure (S_{it}), and the dummy interaction of social disclosure with sensitive industries ($S_{it} \times \text{Sensitive industries}$). We observe a positive association of social disclosure (S_{it}) with firm value at the 1% significance level, and the significance level remains the same after introducing the dummy interaction of social disclosure with sensitive industries ($S_{it} \times \text{Sensitive industries}$). Model 3 includes earnings per share (EPS_{it}), book value per share ($BVPS_{it}$), governance disclosure (G_{it}), and the dummy interaction of governance disclosure with sensitive industries ($G_{it} \times \text{Sensitive industries}$). We observe a negative association of governance disclosure (G_{it}) with firm value at the 10% significance level, and introducing dummy interaction of governance disclosure with sensitive industries ($G_{it} \times \text{Sensitive industries}$) changes the association to positive and highly significant (supporting hypothesis 3). Model 4 includes earnings per share (EPS_{it}), book value per share ($BVPS_{it}$), social disclosure (S_{it}), and the dummy interaction of combined ESG_{it} disclosure with sensitive industries ($ESG_{it} \times \text{Sensitive industries}$). We observe a positive association of combined ESG_{it} disclosure with firm value at the 1% significance level, and the significance level remains the same after introducing dummy interaction of ESG_{it} disclosure with sensitive

industries ($ESG_{it} \times$ Sensitive industries); however, the value of coefficient increases. These results also support hypothesis 3; i.e., the association between sustainability (ESG_{it}) disclosure and market value is stronger among the European firms operating within sensitive industries.

[Insert Table 6 Here]

4.4. Controlling for Firm Size and Leverage

Table 7 presents the results of the regression analysis for equation (3). In this analysis, we add firm size and leverage as firm level control variables since larger firms are more visible, have a larger operational impact, have more borrowing options, and therefore, may have the ability to spend more on sustainability or ESG activities to receive a higher score (Barnea & Rubin, 2010; Miralles-Quirós et al., 2018). After including the control variables for firm size and leverage, we observe that the results are consistent with the results that were reported in Table 5 (without firm level control variables). We notice one interesting change in the results: the association between governance (G_{it}) disclosures and firm value becomes significant positive, which supports our hypothesis 1. The relationship of firm size (SZ_{it}) and firm value is significantly negative, and the relationship of leverage (LV_{it}) and firm value is insignificant for all the models based on equation (3).

[Insert Table 7 Here]

4.5. Controlling for Firm Size, Leverage, and Economic Factors

Table 8 presents the results of the regression analysis for equation (4). In this analysis, we add firm size (SZ_{it}) and leverage (LV_{it}) as firm level control variables and inflation (INF_{jt}) and economic growth (GDP_{jt}) as country level control variables. After introducing the country level economic control variables, we observe that the results are still consistent with the results that were reported in Table 7 (with firm level control variables). Further, we observe a significant negative association between the inflation rate (INF_{jt}) and firm value and a positive but weakly significant association between GDP growth (GDP_{jt}) and firm value. These results explain that an increase in the inflation rate decreases firm value; however, an increase in GDP growth increases firm value. Overall, these results suggest that good economic conditions help to increase firm value.

[Insert Table 8 Here]

4.6. Controlling for Firm Size, Leverage and Institutional Factors

Table 9 presents the results of the regression analysis for equation (4). In this analysis, we add firm size (SZ_{it}) and leverage (LV_{it}) as firm level control variables and banking development (BD_{jt})

and stock market development (SMD_{jt}) as country level control variables. After introducing country level institutional control variables, we observe that the results are still consistent with the results that were reported in Table 7 (with firm level control variables). Further, we observe an insignificant association between banking development (BD_{jt}) and firm value and a positive but weakly significant association between stock market development (SMD_{jt}) and firm value. These results explain that a developed stock market helps firms to perform better and increase value.

[Insert Table 9 Here]

4.7. The impact of board gender diversity on firm value and sustainability (ESG) disclosure

Table 10 presents the results of the regression analysis for equation (5). We observe a significant positive association between the ratio of board gender diversity (BGD_{it}) and firm value (models 1-4), supporting that increased female representation on boards increases the market value of European firms (hypothesis-4). The results remain consistent even after controlling for firm-level and country-level economic and institutional factors. This positive relationship is in line with the previous empirical studies that female representation on boards increases firm performance due to their better monitoring (Adams & Ferreira, 2009) and consequently it increases firm value. Further, increased female representation on boards also enhances the reputations of the firms (Bear et al., 2010) and consequently firm value. Table 11 presents the results of the regression analysis for equation (6). We observe a significant positive association between the ratio of board gender diversity (BGD_{it}) and environmental (E_{it}), social (S_{it}), governance (G_{it}), and combined sustainability (ESG_{it}) disclosure. These results favor our hypothesis-5 and explain that increased female representation on boards increases the individual and collective levels of sustainability disclosure.

[Insert Table 10 and 11 Here]

5. Conclusions and Policy Implications

The purpose of this study is to investigate the impacts of sustainability (ESG) disclosure and board gender diversity on firm value. The work is motivated by the current increasing focus on sustainability and societal discussions such as those on gender equality. ESG is becoming a benchmark indicator for socially responsible organizations and female representation as directors on boards is becoming an indicator for gender balance in the corporate arena. Therefore, the study aims to provide insights regarding how sustainability (ESG) disclosure is relevant for the managers who intend to increase their firm's market value. It also investigates

which of the individual ESG factors (environmental, social, and governance) is more value relevant for European firms. Next, we look at firms in environmentally sensitive industries to investigate if there is a stronger association between sustainability (ESG) disclosure and stock prices since these firms are supposed to have a higher risk since they have relatively higher socioenvironmental impacts.

To conduct our study, we collect the data of 812 European listed firms from 22 European countries. Our results support stakeholder theory that considers sustainability (ESG) activities as value enhancing both for the firm and the stakeholders. By supporting stakeholder theory, our results explain that sustainability (ESG) disclosure is value relevant and has a positive relationship with stock prices. These results imply that it is beneficial for firms to promote their reputations and act sustainably since this will be appreciated by the broader network of other stakeholders who are equally essential for an enterprise's success, thereby leading to more beneficial contracting and opening new avenues of growth. This dynamic and broader growth potential is consequently valued by stock market players, resulting in relatively higher prices for the stocks of these firms. These results also correspond to Elkington (1994) framework of the "triple bottom line", which denotes that firms create value through sustainable activities: a "win-win-win" strategy. The empirical results also show that board gender diversity is value relevant, and the firms with a female presence on their board have a significantly higher sustainability (ESG) disclosure score compared to the firms without a female presence on their board. Further, when we analyze the individual ESG disclosure dimensions, we find that environmental and social disclosures are more value relevant than governance disclosure. For the firms operating in environmentally sensitive industries, the association between sustainability (ESG) disclosure and stock prices is more significant compared to non-sensitive industries. Overall, our findings suggest that ESG factors are value relevant for the stock prices of European firms; therefore, the firms should carry out and disclose sustainability (ESG) activities since it will help the sustainability of the environment, society and business and also increase the firm value.

The views on gender balance and the legislation of corporate governance structures differ among countries. Therefore, in the future, it would be interesting to study only Scandinavian countries to investigate the value relevance of sustainability for the firms operating in these countries since these countries are more similar and rank as the best on sustainability, social and moral development indexes (Qureshi et al., 2019). Further, the firm life-cycle can also be

considered to assess the value relevance of sustainability during the different stages of a firm's life-cycle.

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