

Board attributes and social and environmental performance. Evidence from the energy sector

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Abstract

Research Question: Does corporate governance have an impact on the social and environmental performance of companies in the energy industry?

Motivation: Companies have been oriented in recent years to obtain not only financial performance, but also other aspects, such as social and environmental performance, which are important in the activity of attracting new investors. The environmental and social performance of companies is critical in the activity of attracting new investors, with investors drawn to companies that report more information about how the company participates in social campaigns and how it considers environmental issues. From this perspective and considering legislation relating to reducing the impact of waste and emissions on the environment and the way companies respect the workforce, human rights and society in general, board decisions may be influenced.

Data: Data were collected from the Thomson Reuters database for a sample of 266 companies during the period 2016-2020, consisting of 1.330-year observations.

Tool: The SPSS statistical program was used to run the regression models for the selected sample.

Findings: The results show that the size of the board has a positive and significant impact on environmental performance, while for social performance it has an insignificant positive impact. Additionally, gender diversity and board independence have a significant negative impact on social and environmental performance.

Practical implications: This study complements and supports the existing literature on this relationship in the energy sector. The study has practical implications for investors in their decision making and for board members.

Keywords: Board size, board gender diversity, board independence, social and environmental score, energy industry.

JEL codes: G34, M41, P18

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1. Introduction

Nowadays, the decisions taken by a company have a direct impact on the entire environment (organizations, governance, employees, third parties, etc.). An important role is played by the board structure of the companies that are in charge of strategy and decision making. The decisions taken by boards can affect the environment, human rights, workers; therefore, the new regulations and policymakers set a framework to reduce the impact of company activities on environmental and social issues. Thus, the research question of this paper is: Does corporate governance have an impact on the social and environmental performance of companies in the energy industry?

The research question is based on prior literature referring to the relationship between board attributes and social and environmental performance being positive. The researchers found mixed results on the impact of corporate governance on sustainability performance. Studying the impact of board size and board independence on social performance, Zubeltzu-Jaka *et al.* (2021) found a positive relationship, while Issa and Zaid (2021) in their study found that board gender diversity helps companies achieve better social performance. Furthermore, Haque (2017) found that both board gender diversity and board independence positively affect environmental performance represented by carbon reduction initiatives, while Radu *et al.* (2022) found that board gender diversity negatively affects social performance.

To answer the research question, a sample of 266 companies was analyzed for the 2016-2020 period from the energy industry. The data was extracted from Refinitiv Eikon and was analysed using descriptive statistics, correlation matrix, and multiple linear regression using the SPSS software. The size of the board has a positive impact on both social and environmental performance, concluding that larger boards increase social and environmental performance. The expectation was that board independence and board gender have a positive impact on social and environmental performance, but the hypothesis is not accepted, finding, in contrast, a negative and significant impact was identified.

This study plays an important role in the literature, showing that board size, board independence and board gender diversity affect the social and environmental performance of the companies, the results obtained completing the existence literature (Radu *et al.*, 2022; Zubeltzu-Jaka *et al.*, 2021 or Issa & Zaid, 2021). The study brings new insides from the energy sector related to this relationship; scholars, stakeholders, and other interest parties having a new perspective for this sector, the study being a starting point for those who want to develop new research or to invest in the energy sector.

This study complements and supports the existing literature on environmental and social accounting. The focus of the previous studies was to identify in which ways environmental and social performance is affected by board attributes. This study has practical implications for investors that may help them to invest in those companies that are socially and environmentally friendly, based on their goals.

The board attributes, as well as the social and environmental performance and the hypothesis developed, are presented in Section 2. The methodology, database, and research method are presented in Section 3. The results of the study are presented in Section 4 and the conclusions in the last section.

2. Literature review and hypotheses development

2.1 Board attributes, social and environmental performance

In recent decades, corporate governance research and its relationship with sustainability aspects have increased due to the role of the responsibility given to the board members, which are in direct relation with social and environmental regulation. The board of directors plays an important role in the management of the company, being responsible for establishing business strategies and making decisions with the purpose of achieving a better visibility on the market, to have a better reputation, and a strong relationship with the stakeholders. To achieve their goals, the boards must make decisions, and their decision should be in accordance with the regulations regarding the environmental issues and social aspects. Thus, decisions could be made hardly or easily depending on the size of the board, its independence, and diversity.

An important attribute of the board is its independence. Board independence plays an important role for companies, as directors should effectively monitor and protect the interests of shareholders and avoid personal enrichment (Naciti, 2019). Furthermore, independent directors should ensure that companies follow laws and regulations (Nguyen & Thanh, 2021). There is also the risk that many independent directors on the board may not have solid background knowledge to ensure good environmental performance (De Villiers *et al.*, 2011). As a result, they can give more impartial advice than insiders, since their actions are not influenced by financial incentives. However, Hussain *et al.* (2018) argue that independent directors could protect their board seat but also their own reputation; in this case, directors should take responsibility and act to help the company achieve higher environmental performance.

Recently, special attention has been paid to board gender diversity and its impact on social and environmental performance. The main hypotheses identified in the literature refer to the idea that women are more focused on achieving better social

and environmental performance. Boards with a higher percentage of diversity are seen to be more socially and environmentally conscious (Garcia Martin & Herrero, 2019). Greater gender diversity brings new perspectives, communication philosophies, and experiences to the table, which improves the efficacy of the board and decision-making (Liao *et al.*, 2015).

Due to the new regulation issued by different policymakers such as the European Commission, the G20 Green Finance Study Group, the Global Sustainable Investment Alliance, and others, companies should ensure that they are friendly with the environment, combat climate changes and respect human rights and other social issues in the community. “Corporate environmental performance is a measure of environmental impact, resource consumption, and related financial elements, along with the efforts towards the reduction of such impact and the implementation of preventive measures” (Dragomir, 2018). According to Refinitiv Eikon (2022), the environmental performance is a score computed from three pillars: resource use, the way in which a company reduces the use of energy, water, materials, emission reduction, and create innovative products, which are environmentally friendly. Moreover, social performance is defined by the same entity as the capacity of a company to be implicated in the community, to respect human rights, to produce quality goods for customers, and being careful with the workforce.

From this point of view, it is important to see how the board attributes affect the social and environmental performance of the companies, the next section presenting the hypotheses development and literature review on this relationship.

2.2 Research hypotheses development

Biswas *et al.* (2018) studied the impact of board gender, board independence, and the board sustainability committee on social and environmental performance for a sample of 2,188 ASX-listed firm year observations for the 2004-2015 period. They found a higher social and environmental performance associated with greater diversity of gender between boards, greater independence between boards, and the existence of the sustainability committee. The impact of corporate governance mechanisms and environmental and social performance was studied by several researchers. The impact of board attributes on environmental and social performance was studied by Radu *et al.* (2022) for a sample of 242 companies listed on the Toronto Stock Exchange for the period 2012-2018. The authors found mixed results. Board independence positively affects environmental performance, while a negative impact on social performance was found. Furthermore, the size of the board has a positive effect on both social and environmental performance. Khan *et al.* (2021) found a positive relationship between CEO duality, board size, board independence, and board gender diversity, and social and environmental performance. Additionally,

Al-Gamrh *et al.* (2020) show a negative impact of board independence on financial and environmental performance.

De Villiers *et al.* (2011) studied the impact of board characteristics on pollution prevention, recycling, energy, products and services, and a category capturing other environmental strengths as a measure of environmental performance. The sample consists of 2,151 observations from 1,216 companies, collecting data from the KLD database for the period 2003-2004. Using a quantitative method and based on resource dependence theory, the authors identified that a multimember board influences environmental performance. Furthermore, Walls *et al.* (2012) analyzed board characteristics and environmental performance. Environmental performance was quantified by an index resulting from the summation of environmental strengths and concerns for a sample of 500 Standard & Poor's (S&P) 500 companies, collecting data for the period 1997–2005. Environmental concerns refer to hazardous waste, regulatory issues, chemical, and other emissions or pollution levels. The strengths are related to aspects such as the development and marketing of green products and services, the use of pollution prevention approaches in production, recycling, and the use of alternative fuels. The results show that the size of the board is positively correlated with environmental performance. Therefore, the hypothesis that a larger board of directors helps to increase the environmental performance of companies is supported. Ng and Thosuwanchot (2017) also identified a positive relationship between board size and environmental performance. Studying the impact of board characteristics on environmental performance, Khan *et al.* (2021) found a positive relationship between board size and it. Environmental performance was measured using an index that considered several aspects. The environmental responsibility of companies, investments in environmental activities, or the adoption of technologies used to reduce the impact on the environment were the main elements analysed in the construction of this index. The following hypotheses are developed based on the theoretical considerations presented in the literature.

H1.a.1. The relationship between board size and social performance is positive.

H1.a.2. The relationship between board size and environmental performance is positive.

Researchers have focused on finding a possible association between gender diversity in boards and social and environmental performance (Li *et al.*, 2016; Lu & Herremans, 2019; Orazalin & Baydauletov, 2020; Konadu *et al.*, 2022 and Radu *et al.*, 2022). Li *et al.* (2016) analyzed a sample of 865 publicly traded companies in the US to identify the impact of board gender diversity on environmental policy. The environmental policies of the companies were measured using a six-item index that includes aspects of the recycling policies of the companies, pollution prevention, and the use of clean energy. The authors found that an important role in the development of a good environmental strategy is given to the gender diversity of the board of directors. The results of the study show that greater diversity between boards helps

companies achieve better environmental performance. Rao and Tilt (2016) examined the impact of gender diversity on corporate social responsibility reporting for 115 leading Australian listed companies for the period 2009–2011. Corporate social responsibility was the dependent variable of the study, measured by the number of words devoted to corporate social responsibility issues in the annual report of each company in the sample. Corporate social responsibility issues refer to corporate governance, environmental issues, employees, the community, products and services, and other specific elements. The authors' results show that female board presence is associated with greater transparency of corporate social responsibility. Orazalin (2019) also found that the sustainability committee has a positive impact on social and environmental performance.

Furthermore, Orazalin and Baydauletov (2020) found a positive relationship between corporate social responsibility strategies and board gender diversity in environmental and social performance. The effects of board characteristics and environmental performance were studied by Orazalin and Mahmood (2021), who also found a positive relationship. Reguera-Alvarado and Bravo-Urquiza (2021) studied the impact of board size on corporate social responsibility reporting. Using the generalized method of moments as an analysis technique, the authors concluded that corporate social responsibility reporting is positively associated with board size. Jizi (2017) suggests that boards with a larger number of directors, who have better workload allocation and a broader collective experience and environment, are more effective in setting CSR agendas. Thus, the transparency of corporate social responsibility reporting is encouraged to respond to society's needs.

Al-Jaifi (2020) studied the impact of board gender diversity on social, environmental, and corporate governance in the context of the ASEAN bank for the period 2011–2016. The results show that board gender diversity has a positive impact on corporate governance performance, while on social and environmental performance, board gender diversity has no impact. Issa and Zaid (2021) also found that board gender diversity has a positive impact on environmental performance. Rachisan *et al.* (2015) found a positive relationship between corporate governance mechanisms and environmental performance. The following hypotheses are developed based on the theoretical considerations presented in the literature.

H1.b.1. The relationship between gender diversity and social performance is positive.

H1.b.2. The relationship between gender diversity and environmental performance is positive

Therefore, the analysis of the relationship between board independence and social and environmental performance generated mixed results. Al-Gamrh *et al.* (2020) studied the impact of board independence on financial and social performance. The results show that board independence, measured as a percentage of the total number

of directors, weakens the negative relationship of social performance. Thus, more independent directors on the board would positively influence social performance. The following hypotheses are developed based on the theoretical considerations presented in the literature.

H1.c.1 The relationship between board independence and social performance is positive.

H1.c.2 The relationship between board independence and environmental performance is positive.

3. Research method

The article examines the impact of environmental, social, and governance aspects on financial performance and the impact of corporate governance mechanisms on social and environmental performance. The data was extracted from the Refinitiv database hosted by Thomson Reuters, known as Refinitiv Eikon. This database was chosen because it is a well-known database that holds one of the industry's most comprehensive ESG datasets. The Refinitiv Eikon database was also used by other researchers who studied the ESG aspects such as: Ionaşcu *et al.* (2022), Batae *et al.* (2020; 2021), Orazalin and Baydauletov (2020), Zhang *et al.* (2020), Orazalin (2019), due to its credibility and data quality.

Table 1. Sample distribution

| Area | Year | | | | | | Total observations | % of the sample |
|---------------------------|-------------|-------------|-------------|-------------|-------------|--------------|---------------------------|------------------------|
| | 2016 | 2017 | 2018 | 2019 | 2020 | | | |
| Africa | 1 | 1 | 1 | 1 | 1 | 5 | 0% | |
| Asia | 72 | 72 | 72 | 72 | 72 | 360 | 27% | |
| Central America | 1 | 1 | 1 | 1 | 1 | 5 | 0% | |
| Europe | 57 | 57 | 57 | 57 | 57 | 285 | 21% | |
| North America | 108 | 108 | 108 | 108 | 108 | 540 | 41% | |
| Oceania | 20 | 20 | 20 | 20 | 20 | 100 | 8% | |
| South America | 7 | 7 | 7 | 7 | 7 | 35 | 3% | |
| Total observations | 266 | 266 | 266 | 266 | 266 | 1.330 | 100% | |

The sample distribution of the firm-year observations is presented in Table no. 1 The sample consists of 1.330 firm year observations for the period 2016-2020 for which data for ESG scores are available in the Refinitiv database. Those companies which do not disclose data on governance mechanisms and social and environmental information were eliminated from the sample. Companies included in this study are from all over the world. This study is focused on the energy sector, which has been used by other authors such as Baran *et al.* (2022), Domanovic (2022), Behl *et al.* (2021), Constantinescu *et al.* (2020) or Zhao *et al.* (2018).

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In this study, the multivariate multiple regression model was used, which estimates a single regression model with many outcome variables as other authors have used (Radu *et al.*, 2022):

$$SOC = \beta_0 + \beta_1 CG + \beta_2 Controls + \varepsilon \quad (1)$$

$$ENV = \beta_0 + \beta_1 CG + \beta_2 Controls + \varepsilon \quad (2)$$

To test hypotheses 1.a.1, 1.a.2, 1.b.1, 1.b.2, 1.c.1, and 1.c.2 six regression models are performed as follows:

$$SOC = \beta_0 + \beta_1 BZ + \beta_2 Controls + \varepsilon \quad (1.1)$$

$$ENV = \beta_0 + \beta_1 BZ + \beta_2 Controls + \varepsilon \quad (2.1)$$

$$SOC = \beta_0 + \beta_1 BG + \beta_2 Controls + \varepsilon \quad (1.2)$$

$$ENV = \beta_0 + \beta_1 BG + \beta_2 Controls + \varepsilon \quad (1.2)$$

$$SOC = \beta_0 + \beta_1 BI + \beta_2 Controls + \varepsilon \quad (1.3)$$

$$ENV = \beta_0 + \beta_1 BI + \beta_2 Controls + \varepsilon \quad (2.3)$$

where: SOC is social score, ENV is environmental score, CG is corporate governance mechanisms represented by: BZ - board size, BG – board gender diversity, and BI – board independence.

Table 2 summarizes the measures used for the variables in the regression models to test the hypotheses. To test the hypothesis, the impact of corporate governance mechanisms on social and environmental performance, we choose dependent variable social performance (SOC) and environmental performance (ENV). These two dependent variables were used in their studies by Harjoto and Wang (2020), Orazalin and Mahmood (2021), Orazalin and Baydauletov (2020), Orazalin (2019), Biswas *et al.* (2018), Alsayegh *et al.* (2020) or Batae *et al.* (2020).

Also, some independent variables were taken. Board size (BZ) is represented by the total number of directors on the board, board independence (BI) is a percentage of independent directors on the board, and board gender diversity (BG) is the percentage of female directors on the board, which are the corporate governance metrics used to assess the second hypothesis. These variables were also used by Radu *et al.* (2022), Orazalin and Mahmood (2021), Batae *et al.* (2021), Biswas *et al.* (2018), and Orazalin and Baydauletov (2020) in their studies. As the previous literature relates (Orazalin and Mahmood, 2021; Orazalin and Baydauletov, 2020; Orazalin, 2019; Biswas *et al.*, 2018; Batae *et al.*, 2020; Batae *et al.*, 2021; Alsayegh *et al.*, 2020) I use some control variables to test the hypotheses of this study.

In this study, the firm size (FZ) calculated as the natural logarithm of total assets and the leverage (LV) calculated as the ratio of total debt to total assets were used as the main control variables. Furthermore, the Return of Assets (ROA) and Return of Equity (ROE) are also control variables. In line with prior research, ROA is calculated as the Income After Taxes for the fiscal period divided by the average

Total Assets, and ROE is calculated by dividing the company's net income to total equity. These measures were extracted directly from the Refinitiv Eikon database.

Table 2. Variable explanations

| Variables | Proxy | Type | Authors |
|------------------------|-------|-------------|---|
| Environmental score | ENV | Dependent | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Orazalin (2019); Batae <i>et al.</i> (2020), Alsayegh <i>et al.</i> (2020); Biswas <i>et al.</i> (2018) |
| Social score | SOC | Dependent | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Orazalin (2019); Batae <i>et al.</i> (2020), Alsayegh <i>et al.</i> (2020); Biswas <i>et al.</i> (2018) |
| Board size | BZ | Independent | Orazalin and Mahmood (2021); Biswas <i>et al.</i> (2018), Lu and Wang (2020) |
| Board independence | BI | Independent | Orazalin and Mahmood (2021); Biswas <i>et al.</i> (2018), Lu and Wang (2020) |
| Board gender diversity | BG | Independent | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Lu and Wang (2020) |
| Return on assets | ROA | Control | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Orazalin (2019); Biswas <i>et al.</i> (2018); Batae <i>et al.</i> (2020; 2021); Alsayegh <i>et al.</i> (2020) |
| Return on equity | ROE | Control | Lungu <i>et al.</i> (2019), Batae <i>et al.</i> (2020; 2021); Alsayegh <i>et al.</i> (2020) |
| ESG score | ESG | Control | Alsayegh <i>et al.</i> (2020), Haque and Ntin (2017), Lungu <i>et al.</i> (2019) |
| Firm size | FZ | Control | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Orazalin (2019); Biswas <i>et al.</i> (2018); Batae <i>et al.</i> (2021) |
| Leverage | LV | Control | Orazalin and Mahmood (2021); Orazalin and Baydauletov (2020); Orazalin (2019); Biswas <i>et al.</i> (2018); Batae <i>et al.</i> (2020; 2021); Alsayegh <i>et al.</i> (2020) |

4. Data analysis and findings

4.1 Descriptive statistics and correlation matrix

In a first-level analysis, descriptive statistics are calculated for continuous regression variables. The descriptive statistics of the environmental and social scores, governance metrics and control variables are presented in Table 3.

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Table 3. Descriptive Statistics of Variables

| Variable | N | Min | Max | Mean | Std. Dev. | Skewness S | SE | Kurtosis S | SE |
|----------|------|--------|--------|-------|-----------|------------|-------|------------|-------|
| ENV | 1141 | 0.00 | 96.34 | 46.89 | 26.47 | -0.212 | 0.072 | -1.023 | 0.145 |
| SOC | 1141 | 0.43 | 95.92 | 50.68 | 24.32 | 0.006 | 0.072 | -1.175 | 0.145 |
| BZ | 1139 | 1.00 | 24.00 | 9.68 | 3.14 | 0.915 | 0.072 | 1.636 | 0.145 |
| BG | 1139 | 0.00 | 60.00 | 17.16 | 12.72 | 0.475 | 0.072 | -0.237 | 0.145 |
| BI | 1139 | 0.00 | 100.00 | 61.85 | 24.81 | -0.482 | 0.072 | -0.738 | 0.145 |
| ROA | 1174 | -0.62 | 0.41 | 0.03 | 0.08 | -1.236 | 0.071 | 9.770 | 0.143 |
| ROE | 1228 | -20.09 | 5.25 | 0.06 | 0.67 | -21.964 | 0.070 | 668.526 | 0.140 |
| LV | 1327 | 0.00 | 1.45 | 0.30 | 0.19 | 0.731 | 0.067 | 1.724 | 0.134 |
| FZ | 1327 | 16.91 | 26.73 | 22.56 | 1.76 | -0.060 | 0.067 | -0.190 | 0.134 |

Notes: **S** – Statistic; **SE** - Std. Error

The sampled firms show a mean ENV score of 46.89 and for SOC is 50.68. The mean board size is 1.00 and a maximum of 24 with a mean of 51.95% of them being independent and with a low presence of the female directors in board of 17.16%. The natural logarithm of total assets has a mean of 22.56, which is the size of the firm. With a standard deviation of 1.76, it is slightly distributed, leverage as well, with a standard deviation of 0.30. Furthermore, Table 3 presents descriptive statistics that support the assumption that the data are normally distributed and that a regression model based on these variables is valid (Lungu *et al.*, 2019).

Table 4. Pearson/Spearman correlation matrix

| Variables | ENV | SOC | BZ | BG | BI | ROA | ROE | LV | FZ |
|-----------|---------|--------|---------|--------|---------|---------|---------|---------|--------|
| ENV | 1 | .800** | .454** | .176** | -.098** | .096** | .114** | -0.031 | .553** |
| SOC | .800** | 1 | .350** | .218** | -0.035 | .096** | .110** | -.085** | .419** |
| BZ | .429** | .344** | 1 | -0.002 | -.083** | .064* | .104** | 0.038 | .574** |
| BG | .211** | .226** | -0.020 | 1 | .319** | 0.005 | -0.018 | -.077** | .080** |
| BI | -.114** | -0.052 | -.124** | .274** | 1.0 | -.167** | -.168** | .170** | 0.016 |
| ROA | .124** | .111** | .085** | -0.028 | -.159** | 1 | .856** | -.200** | .105** |
| ROE | .087** | .086** | .073* | -0.001 | -.074* | .280** | 1 | -0.026 | .141** |
| LV | -0.010 | -.071* | -0.006 | -.074* | .140** | -.166** | -.059* | 1 | .101** |
| FZ | .565** | .433** | .532** | .112** | 0.002 | .134** | .107** | .094** | 1 |

Notes: *Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level (1 tailed).

Table 4 reports the Pearson (below the diagonal) and Spearman (above the diagonal) correlation matrix for all the variables included in the study. The results show a positive correlation for SOC, ENV with BZ, and BG at a level of 0.001. Furthermore, BI is negatively correlated at level 0.01 with ENV and SOC. Furthermore, the multicollinearity potential problems were again checked for each regression model

using the variance inflation factor (VIF). Multicollinearity does not exist, the VIF factor being between less than 2.00, below 10.00 with a tolerance range higher than 0.1 (Shan, 2015 and Wang *et al.* 2019).

4.2 Regression results

Furthermore, in Table 5 is analysed the impact of corporate governance mechanism on social and environmental performance were presented.

Table 5. The impact of corporate governance mechanisms on environmental and social performance

| ENV | CST | BZ | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
|---|---------|--------|-------|-------|--------|--------|--------|---------|-------|-------|-------------------|
| Coef. | -34.440 | 0.475 | 1.106 | 8.528 | -0.119 | 2.503 | 0.901 | 926.56 | 10.40 | 2.073 | .000 ^b |
| Sig. | 0.000 | 0.000 | 0.000 | 0.055 | 0.808 | 0.182 | 0.000 | | | | |
| <i>H1.a.1. The relationship between board size and social performance is positive.</i> | | | | | | | | | | | |
| SOC | CST | BZ | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
| Coef. | 24.717 | 0.154 | 1.112 | 5.249 | 0.334 | -5.862 | -1.297 | 818.16 | 2.047 | 0.825 | .000 ^b |
| Sig. | 0.000 | 0.192 | 0.000 | 0.223 | 0.478 | 0.001 | 0.000 | | | | |
| <i>H1.a.2. The relationship between board size and environmental performance is positive.</i> | | | | | | | | | | | |
| ENV | CST | BG | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
| Coef. | -36.825 | -0.103 | 1.138 | 7.255 | -0.113 | 1.881 | 1.225 | 926.05 | 2.068 | 0.842 | .000 ^b |
| Sig. | 0.000 | 0.000 | 0.000 | 0.104 | 0.816 | 0.316 | 0.000 | | | | |
| <i>H1.b.1. The relationship between gender diversity and social performance is positive.</i> | | | | | | | | | | | |
| SOC | CST | BG | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
| Coef. | 25.488 | -0.105 | 1.138 | 4.084 | 0.329 | -6.375 | -1.232 | 832.54 | 2.055 | 0.827 | .000 ^b |
| Sig. | 0.000 | 0.000 | 0.000 | 0.340 | 0.482 | 0.000 | 0.000 | | | | |
| <i>H1.b.2. The relationship between gender diversity and environmental performance is positive.</i> | | | | | | | | | | | |
| ENV | CST | BI | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
| Coef. | -32.071 | -0.148 | 1.125 | 1.574 | -0.242 | 4.426 | 1.343 | 1054.48 | 2.110 | 0.858 | .000 ^b |
| Sig. | 0.000 | 0.000 | 0.000 | 0.711 | 0.600 | 0.013 | 0.000 | | | | |
| <i>H1.c.1 The relationship between board independence and social performance is positive.</i> | | | | | | | | | | | |
| SOC | CST | BI | ESG | ROA | ROE | LV | FZ | F ST | DW | ARS | ANV |
| Coef. | 26.122 | -0.061 | 1.119 | 2.377 | 0.282 | -5.046 | -1.148 | 838.68 | 2.051 | 0.828 | .000 ^b |
| Sig. | 0.000 | 0.000 | 0.000 | 0.580 | 0.546 | 0.005 | 0.000 | | | | |
| <i>H1.c.2 The relationship between board independence and environmental performance is positive</i> | | | | | | | | | | | |

Notes: Coef. – Coefficients; CST – constant; F ST – F statistic; DW - Durbin-Watson; ARS - Adjusted R Square; ANV – ANOVA

First, the results reveal that the size of the board has a significant positive impact on environmental performance and an insignificant positive impact on social performance. These results are supported by previous studies conducted by Nekaa and Boudabbous (2018), Tjahjadi *et al.* (2021) or Rubino and Napoli (2020), and H1.a.1 and H1.a.2 are accepted. More directors on board seem to have more

connections and access to resources to improve the social and environmental performance of companies.

However, a statistically significant and negative impact of board gender diversity and board independence can be observed on both environmental and social performance. The results are in contrast with the results of Biswas *et al.* (2018), who found a positive relationship for both social and environmental performance. Furthermore, the results are partially in line with Radu *et al.* (2022), who found mixed results. For example, board independence has a positive impact on environmental performance, but a negative one on social performance. The last four hypotheses (H2.b1, H2.b.2, H2.c.1, and H2.c.2) tested are rejected.

5. Conclusion

Nowadays, companies want to get more from the markets and attract more investors to develop their products and services. In addition, investors are looking to see how companies are involved in environmental issues and how they are involved in social activities. This study is based on one main hypothesis, focusing on the impact of corporate governance mechanisms on social and environmental performance. The sample consisted of 266 companies in the energy industry, from forty-four countries around the world, that were analysed between 2016 and 2020. A positive impact of the characteristics of the board on environmental and social performance was predicted.

The identified results were mixed. The size of the board has a positive and significant impact on environmental performance, while an insignificant impact on social performance was found. This suggests that larger boards increase the social and environmental performance of companies that act in the energy sector. A negative and significant impact was found for board gender diversity and board independence for social and environmental performance. The literature shows that board independence has a positive impact on environmental performance (Issa & Zaid, 2021; Garcia Martin & Herrero, 2019; Biswas *et al.*, 2018) but at the same time a negative one (Al-Gamrh *et al.* 2021). Furthermore, social performance is positively affected by board independence and gender diversity (Biswas *et al.*, 2018). The presence of women in board shows higher environmental performance, as Burkhardt *et al.* (2020) noted in their study, but for the energy sector the contrary is found.

The multivariate diversified approach that this study provides to the analysis of corporate governance mechanisms on social and environmental performance is its key contribution. Furthermore, the study complements and supports the existing literature on the energy sector. This study also has practical implications for stakeholders considering investing in the energy industry. Now they may be better informed about how environmental, social, and governance aspects affect

profitability, as well as how board characteristics affect social and environmental performance. Additionally, the boards now have an overview of the aspects of ESG and how these factors help improve the company's profitability.

This study has some limitations. First, the study has a small sample and is based on one industry, i.e., the energy industry. Future research might extend the database to other industries and find new research pathways. Second, the general scores for each SOC and ENV factors were used and did not consider their respective subdimensions. Furthermore, future studies might include more corporate governance mechanisms and control variables in the equation model.

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