



THE IMPACT OF BOARD GENDER DIVERSITY ON ENVIRONMENTAL SUSTAINABILITY

DOI: 10.17261/Pressacademia.2024.1894

JEFA- V.11-ISS.1-2024(4)-27-34

Burcin Celik

Yeditepe University, Institute of Graduate Studies, Istanbul, Turkiye.

burcin.celik@std.yeditepe.edu.tr, ORCID: 0009-0009-3396-8572

Date Received: January 24, 2024

Date Accepted: May 11, 2024



To cite this document

Celik, B., (2024). The impact of board gender diversity on environmental sustainability, Journal of Economics, Finance and Accounting (JEFA), 11(4), 27-34.

Permanent link to this document: : <http://doi.org/10.17261/Pressacademia.2024.1894>

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ABSTRACT

Purpose- The Board of Diversity helps companies make more democratic and correct management decisions. The contributions of gender diversity to the financial and non-financial activities of companies are significant. This research was conducted to show the positive contribution of women executives to the environment.

Methodology- The study sample includes 108 American companies in the S&P500 index. The study was organized with panel data of USA companies between 2008 and 2021. OLS regression method was used to analyse the results.

Findings- According to the results of the analyses, the environmental impact of women on the company board is positive and significant.

Conclusion- This study figures out that women executives have higher sensitivity and responsibility towards the environment than men. According to these results, it is essential both in terms of dealing with global warming and in terms of achieving the UN's 2030 targets.

Keywords: Sustainability, board diversity, gender diversity, environment, woman on board, ESG.

JEL Codes: G30, G34, M14

1. INTRODUCTION

Global warming continues to be one of the most critical problems in the world. However, the United Nations has announced a zero-carbon target for 2030. The United Nations (UN) has set 17 Sustainable Development Goals to achieve this goal. Among these goals, "SDG 5 Gender Equality" and "SDG 10 Reducing Inequalities" are of great importance in achieving sustainability goals. In particular, the elimination of inequalities based on gender is necessary to eliminate gender discrimination.

Unfortunately, the gender imbalance in society persists in business life. Sustainable development will only be possible if countries and companies adopt all these goals simultaneously (Özparlak et al., 2023). Today, women are knowledgeable, educated, and qualified enough to do almost as many jobs as men can. However, imbalances in the labor force are also seen in corporate business life. Social and institutional equality is also a requirement of the rule of law and fundamental rights (Özparlak et al., 2022). Currently, the proportion of women executives (WOB) in the management of companies does not even correspond to half of the proportion of male executives.

However, the board of directors (BOD) is the most critical part of a company, where decisions and strategies are determined (Adams et al., 2015; Özparlak et al., 2023). The board of directors' characteristics, such as gender, age, tenure, and race, are examples of diversity (Harjoto et al., 2015). Ensuring diversity in the board of directors is also crucial in gaining different perspectives and strengthening the representation authority of the board. Ensuring diversity in the board of directors also plays a vital role in increasing the performance of companies.

Increasing diversity in the board of directors and its effects is one of the most studied topics by researchers recently (Nowell et al., 1994; Erhardt et al., 2003; Campbell et al., 2008; Nadeem et al., 2019, Nadeem et al., 2020; Özparlak et al., 2023; Gürol et al., 2023). In particular, many studies on gender-based diversity (Gürol et al., 2023; Özparlak et al., 2023). In the literature, many studies show that the company's financial performance improves with women in management (Nowell et al., 1994; Campbell et al., 2008). Nadeem et al., 2020). Women's different perspectives, high communication skills, and detailed work increase the financial performance of companies. In addition, women are more sensitive to the environment than men (Dhenge et al., 2022). The increase in the number of women in management contributes positively to the environmental sensitivity of companies (Gürol et al., 2023). However, some literature studies have found that the contribution of women managers to the environment is negative (Cucari et al., 2018).

This study was conducted to contribute to this dilemma in the literature. This study has been conducted to show the positive contributions of women on the board (WOB) to the environment (E). The study is recommended to researchers and policymakers in the policy maker section. In this way, it is aimed to contribute to the sustainability goals of the United Nations (UN). The study is essential in dealing with global warming and accelerating sustainability goals.

The data set of the study was obtained from Bloomberg Data Terminal. Bloomberg categorizes the sustainability scores of companies under three main headings. Environmental (E) value shows the environmental scores of the companies. Social (S) scores companies' sensitivity to social issues. In addition, Governance (G) scores companies' governance activities. The arithmetic average of these three scores gives the companies' sustainability (ESG) scores.

Some studies in the literature have examined the relationship between board diversity (BOD) and ESG scores. However, since some of the (S) and (G) scores are already derived from board diversity variables, analyzing this relationship may be both semantically and statistically flawed (Özparlak et al., 2023). Therefore, this study examines the relationship between the proportion of women on board (WOB) and companies' environmental (E) sustainability scores. The study sample consists of 108 USA companies from the S&P500 index for which data are available.

Panel data and OLS regression were used as a method in the study. According to the study results, WOB contributes positively to companies' environmental scores. Moreover, this study makes two significant contributions to the literature. Firstly, the positive contribution of gender diversity to the environment is demonstrated. Secondly, there is still a dilemma in the literature on the contribution of women to the environment. This study contributes to the literature by proving the positive contribution of WOB. WOB ratios are one of the most fundamental variables of BOD. The validity of this variable is also essential for the validity of BOD.

In the second section of the study, literature studies are mentioned. The third section mentions the data and methodology used in the research. In the fourth section, research results are shared. The fifth section discusses the results and recommendations for policymakers and researchers.

2. LITERATURE REVIEW

According to the resource dependence theory, increasing diversity in the board raises the company's access to different resources (Hillman et al., 2000). It is because directors of different genders, different cultures, and different minority groups on the board of directors can act as a bridge in the company's connection with different societies, different cultures, and different resources. Because women are more assertive in communication issues, they can cause the company to obtain maximum benefit from different resources. Companies can leverage women's skills and beliefs to develop more effective and sustainable environmental policies, considering many circumstances. These characteristics of women can increase environmental performance and companies' green reputation. Thus, the profitability of companies can increase. In this case, ensuring BOD is essential for a company's financial performance and prestige.

There are many studies in the literature state that the positive relationship between the WOB and the financial performance and market value of the company (Nowell et al., 1994; Campbell et al., 2008; Erhardt et al., 2003; Reguera-Alvarado et al., 2017; Nadeem et al., 2019; Wilson et al., 2009). A balance between board gender diversity is essential in making more innovative, creative, and better-quality decisions (Wellalage et al., 2013). In addition, men's and women's different perspectives and experiences on issues can facilitate the company's decision-making processes. The presence of female employees can enhance team performance because more diverse teams can lead to a broader perspective and, therefore, better decisions can be made. These decisions can ultimately lead to higher job satisfaction and productivity (Burgess et al., 2002).

Communication can also be expressed as transferring feelings, thoughts, opinions, or information between people. Communication can be carried out verbally and by transferring feelings and thoughts in writing. Considering that women are more effective than men in terms of communication in business life, we can also understand that they interact more effectively with other employees in the company. Thus, in a crisis, this communication can lead to positive interaction and motivation to overcome the crisis. However, management in times of crisis will also be with the success of female managers or employees. If we consider the characteristics of women, such as interpersonal relationships, empathy, social responsibility, self-esteem, and stress resistance, a woman in any position will make a difference in the place where she works because of these characteristics. In the past, men could hold higher positions because of their stress resistance. However, now that people's skills are more important, women's improved interpersonal skills will enable them to reach higher positions (Dr Steiner et. al). In addition, studies explain women's positive environmental performance on the board (Özparlak et al., 2023; Gurol et al., 2023; Nadeem et al., 2020). Women are much more sensitive to the environment than men (Dhenge et al., 2022). Women are different from men in terms of their sensitivity to the environment and looking after other people's interests (Carlson, 1972). Female managers are more caring and kinder towards the environment (Eagly et al., 2003).

The contribution of female employees is outstanding, especially in recycling and more economical use of internal resources. Again, we can associate this situation with the more giving and sensitive nature of being a woman. Women have feminine

characteristics and are more sensitive to their maternal structure. It is in women's nature to be more embracing and thoughtful regarding being more sensitive to the environment. If we talk about the sense of justice, since the emotional structure of women is more prominent, their sense of justice has also developed. This situation shows us that women who are managers behave more justly to their colleagues working at lower levels. If a company has an environment of justice, trust, and motivation, employees who are more sensitive to the environment and the company motto can also be created. A feminine company is a sensitive company, embracing and having aesthetic concerns. Aesthetic concerns are inspired by nature. An organization inspired by nature will be more sensitive to the environment.

In the future, aesthetics will be an essential issue for companies. The only way to achieve this is to look like a woman. If we reach the natural in the perfect by taking our inspiration from nature and returning to nature again, we can be more sensitive to the environment.

From another perspective, the woman-nature relationship can be represented by metaphorical expressions such as "Mother Nature" (Guthrie, 1993). "Mother Nature" is a common personification that focuses on nature's life-giving and nurturing aspects, embodying it as a mother (Jelinski, 2011). Here, in fact, with the definition of mother, we can see the woman's relationship with nature and the woman's contribution to nature through this transformation.

With these perspectives in mind, companies can capitalize on women's innate skills and beliefs to develop more effective and sustainable environmental policies, improving environmental performance and enhancing companies' green reputation, thus increasing profits.

In light of these studies in the literature, the following hypothesis is proposed in this study.

H₁: The Woman on Board (WOB) is positively associated with Environment (E) scores of the companies.

3. DATA AND METHODOLOGY

3.1. Data

In the study, companies in the S&P500 index in the USA were taken as a sample. The data of 108 companies in the sample between 2008 and 2021 were accessed.

Table 1: Definition of Variables

Variable	Symbol	Source
Environment Score	E	Bloomberg
Woman on Board (%)	WOB	Bloomberg
Board Size	BS	Bloomberg
Financial Leverage	FNL	Bloomberg
Tobin Q	TQ	Bloomberg
Total Assets	TA	Bloomberg

Table 1 shows the definition of the research. The data was provided from the Bloomberg data terminal. The environmental scores of the companies calculated by Bloomberg are indicated by (E). Bloomberg calculates sustainability scores by measuring many factors and their effects. Environmental scores take a value between "0" and "100". The WOB ratio shows the percentage of women on board. It is calculated by dividing the number of women on board by the number of people on board (BS). Board Size (BS) explains the number of company boards. Financial Leverage (FNL) is a financial indicator used to show companies' risk status. It is calculated by dividing the Total Debt ratio by the Shareholder's Equity value. Tobin's Q (TQ) is another indicator used as a performance measure of companies. In addition, it gives the market value of a company. This ratio is obtained by dividing the market value of the financial rights of the firm by the current replacement cost of the firm's assets (Nguyen et al., 2015). Total Assets (TA) shows the total assets owned by the company. This value is an indicator value to show the size of companies. In the study, the logarithmic transformation of the TA value was made.

Table 2: Definition of Company Sectors

Bloomberg Sectors	Number of Company
Financials	18
Industrials	16
Utilities	14
Materials	13
Consumer Staples	11
Health Care	10
Consumer Discretionary	8

Information Technology	8
Energy	4
Communication Services	3
Real-Estate	3
Total	108

Table 2 shows the distribution of companies in the sectors. Accordingly, the most common sector in the study is the finance sector (18 companies) and the least common sector (3 companies) is the real state sector.

Table 3: Definition of Company Size

Size of The Company	Total Asset (\$)	Number of Company	Number of Company (%)
Large Size	5 million - 1 million	37	34.3%
Medium Size	100 thousands -10 thousands	61	56.5%
Small Size	10 thousands - 0	10	9.3%

Table 3 shows the distribution of the companies according to their size. According to these results, 37 companies are in the large size group. It equals the %34.3 of all companies. In addition, there are 31 companies in the medium size group. It corresponds to %56.5 of all companies. The number of companies in the small size group is 10. It corresponds % to 9.3 of all companies. Accordingly, the sample's most significant number of companies belongs to medium-sized companies, with 61 companies. In addition, the small group has the lowest number of companies, with 10.

3.2. Methodology

Panel data is used in the study. OLS regression model is used to test our hypothesis H_1 . The model is specified as follows:

$$(E)_{it} = \beta_0 + \beta_1.WOB + \beta_2.BS + \beta_5.FNL + \beta_6.TQ + \beta_7.TA + \epsilon_{it} \tag{1}$$

In equation (1), E is the dependent variable. (i) represents companies and (t) represents years. WOB is the independent variable. BS, FNL, TQ and TA are the control variables of the study. ϵ is the error term of the equation.

4. FINDINGS

4.1. Descriptive Statistics and Correlation Analysis

Figure 1 shows the E, S, and G scores of The USA Companies between 2008 and 2021. According to the results in figure 1, all three scores are in an upward trend. It is seen that these three sustainability scores (E, S, G) are in an upward trend. The fact that these three scores are increasing is precious in achieving the UN's sustainability goals. Nevertheless, whether it is sufficient is a separate issue that needs to be discussed.

Figure 1: Average E, S and G Scores of the Companies

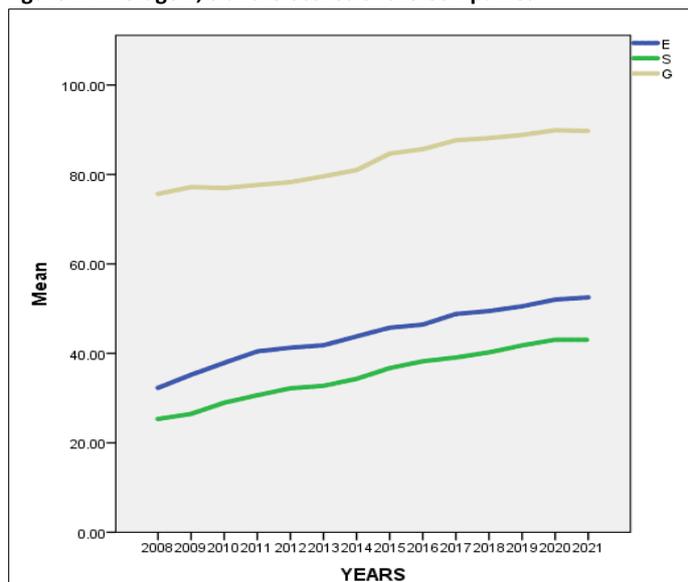


Figure 2 shows the number of WOB in US companies between 2008 and 2021. Looking at the graph, the number of female managers in 2008 was approximately two people, which increased to 4 in 2021.

Figure 2: Average Number of the Woman on Board in the Sample

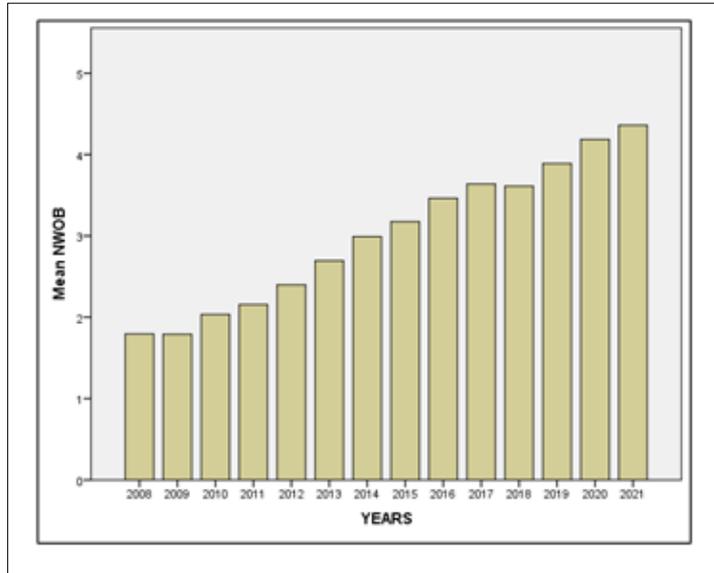


Figure 3 shows the percentage WOB of the USA companies between 2008 and 2021. This ratio is calculated by dividing the number of women on board by the number of people on the board (BS). Therefore, the result is expressed as a percentage (%WOB). In 2008, the WOB rate was 15 percent; in 2021, this rate increased to 37 percent. Compared to 2008, this rate has more than doubled. It is a positive result to achieve an increase in this rate due to legal obligations and sustainability pressures. However, the presence of WOB without or with limited authority makes them a puppet representative.

Figure 3: Average Percentage of the Woman on Board (WOB) in the Sample

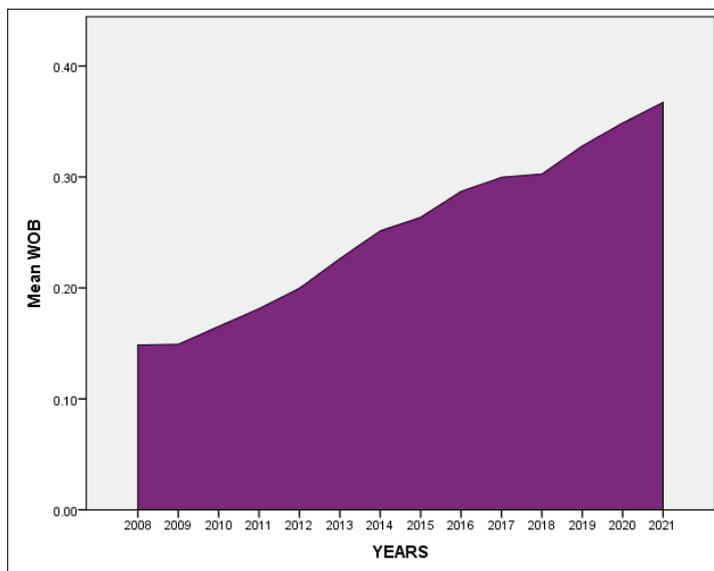


Table 4 includes the descriptive statistics of the study data. There are 1512 values in the panel data sample. FNL is the value with the highest maximum value. E is the variable with the highest E value. E, WOB, and TQ are the variables with zero value and the lowest value.

Table 4: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
E	1512	0.00	84.42	44.160	16.378
WOB	1512	0.00	.70	0.251	0.128
BS	1512	5.00	25.00	12.093	3.248
FNL	1512	1.27	1601.25	7.626	42.260
TQ	1512	0.00	16.26	1.762	1.458
TA	1512	2.81	6.50	4.654	0.712

Table 5 shows the results of the correlation analysis of the research. There is a positive and significant correlation between WOB values and E values of the companies. The results are consistency with literature studies (Özparlak et al., 2023; Gurol et al., 2023)

Table 5: Correlation Matrix

	E	FOB	BS	FNL	TQ	TA
E	1	0.101 **	0.085 **	-.020	0.060 *	-.039
WOB	0.101 **	1	-0.073 **	-.017	0.091 **	.119 **
BS	0.085 **	-0.073 **	1	.013	-0.209 **	.441 **
FNL	-0.020	-0.017	0.013	1	0.013	.051 *
TQ	0.060 *	0.091 **	-0.209 **	.013	1	-.324 **
TA	-0.039	0.119 **	0.441 **	.051 *	-0.324 **	1

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

Table 6 shows the OLS regression test results of the study. R^2 is %3.1, and the model's F statistic value is significant ($p < 0.05$). According to these results, the effect of WOB ratios on E is positive and significant. These results are consistent with the literature studies (Özparlak et al., 2023; Gürol et al., 2023). In addition, the effect of BS on E is also positive and significant. On the other hand, the effect of FNL and TA control variables is negative and statistically insignificant. The effect of TQ on E is positive and statistically insignificant as well.

Table 6: Result of OLS Regression

Depended Variable: E		
OLS Resregion		
	B	t-statics
Constant	42.083	4.713 ***
Independent Variables		
WOB	14.891	1.951*
Control Variables		
BS	0.747	1.704*
FNL	-0.005	-0.401
TQ	0.452	0.653
TA	-2.443	-1.296
R^2		0.031
Adjusted R^2		0.027
F-Statistic		9.500
Prob.		0.000

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

5. CONCLUSION

This research focuses on board gender diversity. The study aims to contribute to the United Nations (UN) 2030 sustainability goals. In particular, this study refers to targets 5 (Gender Equality) and SDG-10 (Reduced Inequalities). Gender equality and reduced inequalities are not only an obligation but also a requirement of the Universal Declaration of Human Rights. However, these goals are essential not only for individuals but also for companies. Equality between the genders in business life must also be ensured.

In this context, the boards of directors of companies are essential. Because the decisions made there affect all employees and, indirectly, the whole of society, the BOD can ensure that the decisions made by the board of directors are correct and democratic. BOD can be ensured by differentiating variables such as race, gender, age, and length of service.

One of the most important independent variables in the BOD is gender diversity. However, when female executives are mandatorily appointed (Burgess et al., 2002) and are not empowered, they should not be expected to be effective on the board. However, when empowered, female executives are more sensitive to social issues than male managers (Birindelli et al., 2018). However, studies have generally focused on WOB ratios and company financial performance or financial risk. The number of studies focusing on non-financial issues is minimal. This study focuses on the relationship between WOB and companies' e-scores. For the research sample, 108 USA companies were analyzed over 14 years. It is tough to obtain companies' sustainability scores. Therefore, the study has limitations. The research covers 108 companies in the S&P500 for which data is available. The main reason for selecting the S&P500 companies in the study is that the companies in the S&P500 should be corporate firms that are among the largest companies in the USA and the world. It increases the confidence in the data set. In addition, the data could be accessed due to their proximity to the sustainability concepts.

According to the results, the WOB ratio's contribution to the companies' E-scores is positive and significant. These results exemplify that women can be successful executives when they are removed from being dummy managers and given authorizations appropriate to their education and experience. In addition, it has been proved that women executives can be more successful in social, organizational, and managerial areas rather than only managing the financial performance of companies.

Concerns about global warming are increasing day by day. The damage caused by humanity to nature must be stopped as soon as possible. For this, businesses must first be at the forefront of these efforts. The decisions taken by the enterprises' boards of directors have a critical value in this sense. In this sense, policymakers need to apply the necessary incentives and sanctions to ensure that the decisions made by the board of directors of companies align with sustainability targets.

Apart from this, training should be organized to improve sustainability and to ensure that the employees understand it well. Companies with high sustainability scores should be incentivized and given some privileges. Efforts should be made to increase the diversity of company boards of directors.

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