

Gender heterogeneity in the boardroom and corporate sustainability performance of quoted manufacturing firms in Nigeria

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Abstract

Purpose – Prior studies have shown that heterogeneity plays a crucial role in addressing soft issues linked to a firm's corporate social responsibility stance. The purpose of this paper is to extend the prior literature on the effect of gender heterogeneity on environmental, social and economic performance dimensions, specifically, whether the female boardroom presence weakens or strengthens the performance along the three dimensions, commonly referred to as the corporate sustainability.

Design/methodology/approach – The study from a positivist philosophy adopts a quantitative approach, and the final sample consisted of forty-six companies listed on the Nigerian Stock Exchange for the year 2011–2018. The final sample was a balanced panel of 344 firm years. The dependent variables were return on assets (ROA), environmental performance (ENV) and donations made for social causes (SOP). The ENV was measured using a content scoring system, with range of 1 to 5. The data were analysed using the fixed effects and GLM regression models. To further address the issue of endogeneity, a two-stage least squares regression was conducted.

Findings – The findings show a positive relationship between gender heterogeneity and ROA, which was also confirmed for the environmental performance index. However, the sign reversed in the SOP model and showed a negative relationship between gender heterogeneity and donations, the proxy for SOP. The results are in tandem with the stakeholder axioms that argue that commitment to other stakeholder groups strengthens firm performance in the long run.

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Note: Supplementary materials that are included in the article are available online.

Erratum: It has come to the attention of the publisher that the article Egbunike, C.F., Igbinovia, I.M., Oranefo, C.P. and Iyoha, A.-O.I. (2023), "Gender heterogeneity in the boardroom and corporate sustainability performance of quoted manufacturing firms in Nigeria", *Asian Journal of Accounting Research*, Vol. 8 No. 4, pp. 334-347. <https://doi.org/10.1108/AJAR-01-2022-0014>, was originally published with the tables 2, 3 and 4 presented as supplementary material via external links; these have now been amended and the supplementary material is hosted alongside the article to ensure that it remains accessible in perpetuity.



Research limitations/implications – An implication of this study is the fact that information availability has been rapidly escalating in the country, leading to rising social movements and civic unrest; therefore, corporations that face negative castigations may pay the huge price of product boycott and loss of market value.

Originality/value – The findings of this study provide additional insight into the influence of female boardroom presence on the environmental, social and economic performance of firms. The findings suggest the relevance of the resource dependence theory, especially from a developing country context, to ensure an improved corporate governance structure in Nigerian manufacturing firms.

Keywords Gender heterogeneity, Corporate sustainability, Environmental performance, Social performance, Economic performance

Paper type Research paper

1. Background of the study

The Board of Directors (BoDs) is the most influential decision-making unit of an organisation (Association of Chartered Certified Accountants [ACCA], 2015). It supervises, monitors and controls managerial actions, and implements key financial and strategic decisions (Ferreira, 2010). The BoDs provide a link between the corporation and the environment and the strategic pathway for achieving sustainability in corporations. The interest in the issue of gender heterogeneity has peaked in recent times. Recent attention has been directed at the influence of heterogeneity on the role of BoDs and a means of enhancing corporate governance (ACCA, 2015). Scholars argue that heterogeneity is a means to tackle the “inherent risk of insularity and hindrance brought by homogeneity” (Alfiero *et al.*, 2015). The homogeneity of BoDs limits their decision-making ability (Alfiero *et al.*, 2015), and may eventually enthrone “unethical decision-making” (Arfken *et al.*, 2004). Heterogeneity enhances problem-solving and managerial efficiency and ultimately determines the effectiveness of the board’s composition (Alfiero *et al.*, 2015).

The issue of heterogeneity has proven to be a significant internal corporate governance mechanism, and recent evidence shows that “heterogeneity in BoDs” positively contributes to corporate social responsibility (Beji *et al.*, 2020). The literature documents that heterogeneity encompasses demographics such as age, gender, tenure, nationality or ethnicity (Hoang *et al.*, 2016). Major characteristics of top management teams considered included demographic characteristics (i.e. age, gender, educational level and financial work experience) (Qi *et al.*, 2017). However, the paper focuses on gender heterogeneity. The authors have shown that female directors are more sensitive to “soft issues” than male directors (Huse and Solberg, 2006). Thus, a firm with a greater proportion of female directors would most likely appear ethical (Landry *et al.*, 2016). Harjoto *et al.* (2018) found evidence that gender heterogeneity increases the corporate social responsibility of firms producing consumer-oriented products. The available studies were conducted using several self-constructed indexes for measuring corporate social responsibility. This evidence also extends to consumer-focused manufacturing firms. There is still room for more empirical evidence on the nexus of corporate governance and sustainability accounting.

Thus scholars have argued that organisations that are driven by the financial bottom line with the neglect of other key stakeholders in the ecosystem may lower firm valuation in the long run. Therefore, of prime concern in the contemporary business environment is how managers can grow profits, while simultaneously tackling social and environmental responsibilities. The proponents of sustainability argue that it involves a simultaneous pursuit of economic prosperity, environmental quality and social equity. Several factors have cushioned the drive for sustainability, such as the World Wide Web, activities of NGOs, growing consumer awareness and greenhouse gas (GHG) emissions. In the Nigerian context, studies have shown that sustainability affects the bottom line and is now a fundamental determinant of corporate performance (Udeh and Ezejiofor, 2018). Olaoti (2016) in Nigeria found a positive significant impact of gender heterogeneity on ROE. The Nigerian Stock Exchange (NSE) has demonstrated efforts at integrating sustainability into existing business models, which culminated in the production of Sustainability Disclosure Guidelines (SDG), covering environmental, social and governance (ESG) issues. However, this SDG is still voluntary.

The inconsistent findings provide an impetus for the study with an opportunity to extend prior literature. On that note, in this study, we examined whether the inclusion of female directors on the corporate board has any impact on the different components of corporate sustainability, that is economic, environmental and social dimensions. Prior studies, such as [Olaoti \(2016\)](#), have reported that gender had a positive significant impact on ROE. Interestingly, [Salami *et al.* \(2020\)](#) found a negative significant association between gender heterogeneity and loan loss provisioning. Both studies and similar studies likewise have mainly focused on the economic dimension. However, corporate sustainability is a three-pronged system, which requires a simultaneous approach. The study makes the following contributions: first, it extends the prior study by [Oba and Fodio \(2012\)](#) that utilised empirical data from 2005 to 2007 and a sample of random firms. Recently, [Salami *et al.* \(2020\)](#) used Blau's index on a sample of Deposit Money Banks. They, however, focused on loan loss provisioning as the dependent variable. Secondly, the period provides us with a good research setting as the Federal Government in 2019 revised the Code of Corporate Governance, which altered the board structure of many companies. The Financial Reporting Council (FRC) announced the release of the code which was aimed at institutionalising best practices in corporate governance in Nigeria. Lastly, the inclusion of a wider vector of control variables and the use of two-stage least squares approach to address the issue of endogeneity would provide deeper insight into the peculiarities of developing countries as against their developed counterparts. Also, the disaggregated focus on environmental ([Anazonwu *et al.*, 2018](#)), social ([Oba and Fodio, 2012](#)) and economic performance provided an impetus for the study on the relative lack of empiricism within this period, and the fact that prior studies disparately focused on conglomerates, the consumer goods sector or industrial goods sector.

This study aggregates manufacturing firms across the three sectors to further improve the generalisability of the study findings and tackle the lacuna from prior studies. The inconsistent findings in the governance-performance literature are symptomatic of inadequacies in econometric techniques employed. The study employs the panel fixed effects estimator and a dynamic panel data approach. The next section discusses related prior literature and the hypotheses development, followed by the methodology employed in the study. The paper ends with a discussion of the research findings and the conclusion of the study.

2. Literature review and hypotheses development

Heterogeneity in its simplest form refers to "differences", which can be associated "with age, gender, physical appearance, culture, job function or experience, disability, ethnicity, personal style, or religion ([Turgut and Hafsi, 2008](#), p. 69). Heterogeneity is a human characteristic that differentiates one person from another. This includes biological characteristics of race, gender, age, colour, national origin as well as family and society into which they were born. Heterogeneity in the boardroom refers to a wide range of people different from each other ([ACCA, 2015](#)). It refers to "differences between individuals on any personal attributes that determine how people perceive one another" ([Gonzalez and DeNisi, 2009](#)). According to [Kang *et al.* \(2007\)](#), heterogeneity is the "variety in the composition of the board of directors", with respect to characteristics such as expertise, managerial background, personality, age, gender, education and values. Heterogeneity is of two forms, which are observable heterogeneity which includes nationality, ethnicity, gender and age, while the less visible heterogeneity includes industry experience, education, functional and occupational backgrounds and organisational membership ([Kang *et al.*, 2007](#)), life experience and personal attitudes ([ACCA, 2015](#)). The former remains the focus of the study, that is gender heterogeneity measured as the number of female board members (FEMB).

According to the resource dependence theory (RDT), BoDs that are diverse in “ethnicity, gender, experience, education and background, possess a considerable range of different knowledge and skills” (Thomsen and Conyon, 2012). Authors have argued that heterogeneity promotes problem-solving, increases leadership effectiveness and effectively facilitates global relationships (ACCA, 2015; Kang *et al.*, 2007). The broad benefits of board heterogeneity include the following (ACCA, 2015): more effective decision-making, better utilisation of the talent pool and enhancement of corporate reputation and investor relations by establishing the company as a responsible corporate citizen. The disclosure of social and environmental information provides firms with several benefits, such as improves corporate reputation (Carroll and Shabana, 2010), reduces idiosyncratic risk (Bassen *et al.*, 2006), signals management efficiency and improves capital markets for enhanced credit ratings (Jiraporn *et al.*, 2014).

The RDT argues that the corporation is an open system that is highly dependent on the external environment (Pfeffer, 1982). The BoDs are considered a link between the firm and the resources that it needs from the external environment; therefore, heterogeneous BoDs can facilitate access to such valuable resources. The literature documents mixed findings on the association between gender heterogeneity and firm performance. While some document a positive relationship (Carter *et al.*, 2003), others find a negative or no significant relationship between the two concepts (Carter *et al.*, 2010; Adams and Ferreira, 2009). Curtis *et al.* (2012) using data from more than 2000 global companies, found that female representation on BoDs was associated with better performance and share prices, including lower volatility in earnings and share prices. Olaoti (2016), using empirical data from Nigeria, from the period 2005 to 2012, showed that gender had a positive and significant impact on ROE. In Palestine, Zaid *et al.* (2019) using data that spanned the from 2013 to 2016, showed that gender heterogeneity had a positive insignificant effect. However, in contrast, Marinova *et al.* (2016), using data from Netherlands and Denmark for the year 2007, analysed using the two-stage least-squares technique, showed no relationship between gender heterogeneity and firm performance (proxied by Tobin’s Q). Mohammad *et al.* (2018), in Jordan, showed a non-significant negative relationship between the percentage of women on BoDs and the financial performance (ROA) of the banks. Thus, the study agrees with the first strand of research that proposes a positive association between board heterogeneity and the firm’s economic performance. Hence, the hypothesis is stated as follows:

H1. There is a positive association between gender heterogeneity and the firm’s economic performance.

The stakeholder theory argues that sustainability represents an attempt by managers to serve the interests of a wider stakeholder group via the social and environmental bottom lines. Rizk *et al.* (2008) opined that sustainability entails “the process of communicating the social and environmental effects of organizations’ economic actions to particular interest groups within society and society at large”. Women may be particularly sensitive “to – and may exercise influence on – decisions about certain organizational practices”, such as corporate social responsibility (Nielsen and Huse, 2010). The RDT suggests that firms engage in varied community-related and social practices in a bid to manage their environment (Arora and Petrova, 2010). Thus, organisations are mainly unable to meet up with all the resources they require, thereby “entering into transactions and establishing relationships with elements in the environment”, which therefore proved the needed resources (Aldrich and Pfeffer, 1976, p. 83). Moreover, gender socialisation theory arguably underscores the difference between males and females in their orientation towards moral principles, largely because women have better internalised ethical and communal values through their social roles (Hyun *et al.*, 2016). Women, through allying, prepare and involve themselves in board matters and take part in vital decision-making (Huse and Solberg, 2006). Thus, the presence of women in the corporate boardroom has proven strategic in reorienting companies towards

improving environmental performance sustainability and meeting the Sustainable Development Goals (Gallego-Sosa *et al.*, 2021). Using empirical data from Jordan, Ibrahim and Hanefah (2016) found a positive association between gender heterogeneity and CSR disclosure. Hence, the hypothesis is stated as follows:

H2. There is a positive association between gender heterogeneity and the firm's environmental performance.

This is related to gender attributes when compared to males, such as feminine traits: socially desirable behaviour and kindness; the masculine traits: dominance, competitiveness and aggressiveness. RDT postulates that the main concern of organisations is the control of environmental resources (Pfeffer, 1982). RDT has consistently emphasised that heterogeneous BoDs are more likely to offer greater resources from a diverse combination of different soft skills (Rubino and Napoli, 2020; Thomsen and Conyon, 2012). Arguably, Rubino and Napoli (2020) suggest that such a diverse skill set would lead the firm to improved environmental knowledge and opportunity awareness. Studies have shown varying effects of female boardroom participation on corporate performance. Cumming *et al.* (2015) showed that as female representation on BoDs increased, the level of corruption in their sample companies declined. Ibrahim *et al.* (2009) showed that female managers tend to exhibit more positive attitudes towards the adoption of an ethics code in their organisation. Using empirical data from France, Beji *et al.* (2020) analysed firms from the SBF120 from 2003 to 2011, and found that gender heterogeneity was positively associated with human rights and corporate governance. Thus, the study agrees with the strand of research that proposes that gender participation improves a firm's ethical posture. Hence, the hypothesis is stated as follows:

H3. There is a positive association between gender heterogeneity and the firm's social performance.

3. Methodology

The study adopts the *ex-post facto* research design. The choice of *ex-post facto* research design hinges on two reasons: (1) the study relied on historic accounting data and (2) the data were obtained from annual reports and accounts of the selected consumer goods firms in Nigeria. The initial sample is based on 67 firms in the manufacturing sector that spanned from 2011 to 2018 fiscal years. However, on further examination, firms from three sectors were dropped, having been covered in prior studies on firm performance and the non-availability of data for some firms. Our final sample consists of a strongly balanced panel of 344 firm years from the manufacturing firms from three sectors listed on the Nigerian Stock Exchange (NSE), from 2011 to 2018. Therefore, the desire to ensure homogeneity and utilise a balanced panel shrank to 43 firms, as shown in Table 1.

3.1 Sources of data

The study relies on secondary sources of data. The data are obtained from the annual financial statements of each of the companies included in the sample. The reliability of such data is enshrined in the requirement of an external audit of all publicly quoted companies on the NSE. Part X1, Chapter One of the Companies and Allied Matters Act (CAMA), requires companies to present accounts that are a true and fair reflection of the state of affairs of the company.

3.2 Methods of data analysis

The study employed the use of descriptive statistics to describe patterns in the data in terms of the mean, minimum and maximum values, standard deviation, kurtosis and skewness. The inferential statistical procedures employed include Pearson's correlation analysis and

fixed effects (FEM) regression approach to check the relationships among the variables of the study and further test the hypotheses.

3.2.1 Model specification. The econometric models utilised in the study to test the relationship of independent variables with the company’s sustainability performance are shown below. The models enabled the researchers to describe the essence and interrelationship within the system or phenomenon it depicts. They are specified below in the explicit form:

$$ROA_{i,t} = \beta_0 + \beta_1 FEMB + \beta_2 GH_{i,t} + \beta_3 BSIZE_{i,t} + \beta_4 IND_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 FLEV_{i,t} + \beta_7 FAGE_{i,t} + \beta_8 SG_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ENV_{i,t} = \beta_0 + \beta_1 FEMB + \beta_2 GH_{i,t} + \beta_3 BSIZE_{i,t} + \beta_4 IND_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 FLEV_{i,t} + \beta_7 FAGE_{i,t} + \beta_8 SG_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$SOP_{i,t} = \beta_0 + \beta_1 FEMB + \beta_2 GH_{i,t} + \beta_3 BSIZE_{i,t} + \beta_4 IND_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 FLEV_{i,t} + \beta_7 FAGE_{i,t} + \beta_8 SG_{i,t} + \varepsilon_{i,t} \quad (3)$$

where:

- ROA - return on assets
- ENV - environmental performance
- SOP - social performance
- FEMB - number of females sitting on the board
- GH - heterogeneity score computed using Blau’s index
- BSIZE - board size
- IND - board independence
- FSIZE - firm size
- FLEV - firm leverage
- FAGE - firm age
- SG - sales growth

The level of significance was set to $p = 0.05$.

3.2.2 Variables definition and measurement. The data were retrieved from annual financial reports and comprised of three distinct categories: dependent, independent and the control

S/No	Sector	No of firms
1	Conglomerates	6
2	Consumer goods	21
3	Industrial goods	16
	<i>Total</i>	<i>43</i>
	<i>Excluded firms</i>	
4	Agriculture	5
5	Healthcare	10
6	ICT	9

Source(s): Nigerian Stock Exchange Website (2019)

Table 1.
Final sample size of
the study

variables of interest. The proxy for the dependent variables, which is corporate sustainability performance, was measured using three proxies. First, for the economic performance of the company, the return on assets (ROA) is used. The ROA is measured as the ratio of profit after tax divided by average total assets. The second proxy, for the environmental performance of the company, the content analysis methodology was used. The content analysis has been utilised in several prior studies (Erin *et al.*, 2021), which involves a codification of the textual information (or content) from annual reports into various categories or sub-groups depending on pre-established criteria (Anazonwu *et al.*, 2018; Krippendorff, 2004; Oraka *et al.*, 2018). The study employs a disclosure index similar to that used in prior studies. The index categorises information along five strengths covered, as follows: the broad community involvement or intervention, employee health and safety, the governance-related environmental dimension, research and development activities across these causes and, finally, other related environmental information. The procedure involved the use of a dummy variable 0 or 1 to characterise discourse along with these five strengths. This is consistent with the approach employed in prior studies conducted in Nigeria (Anazonwu *et al.*, 2018; Erin *et al.*, 2021; Oraka *et al.*, 2018). The third proxy, for the social performance of the company, was measured using the amount of money committed to any charitable project, host community project and so forth (i.e. donations to a cause of social nature). Similarly, Oba and Fodio (2012) proxied corporate philanthropy using charitable donations to bodies recognised by the CAMA.

In this study, the main independent variable of interest is the FEMB, that is the number of female directors sitting on the board by the financial year-end. However, to further strengthen the analysis, the heterogeneity score using the Blau's index was included for robustness analysis. The index has been widely used in studies in developed countries (Burkhardt *et al.*, 2020; Fernández-Torres *et al.*, 2021). The index is calculated as follows:

$$\text{Blau index} = 1 - \sum_{i=1}^n P_i^2$$

where P_i is the percentage of males or females in the boardroom, while n is the number of categories (i.e. male and female). The computed value of the Blau index ranges from 0 to 0.5, where the former indicates the absence of heterogeneity, and the latter the maximum heterogeneity when the number of females equals that of males in the boardroom. The figures used for the former measurement were obtained directly from the company's annual report. In this study, we include six control variables, namely, board size (BSIZE), board independence (IND), firm size (FSIZE), leverage (FLEV), firm age (FAGE) and sales growth (SG).

- (1) The board size is measured as the total number of directors on the board at the financial year-end. Arguably, RDT suggests that BoDs are a combination of several individuals who combine resources in the form of experiences and knowledge to direct and steer a firm (Hillman and Dalziel, 2003), and therefore they play a role in firm performance. De Villiers *et al.* (2011) found a positive effect of board size on firm environmental performance. This was also supported in the study by Rubino and Napoli (2020). Thus, it is expected that BSIZE should have a priori positive (sign) with firm performance.
- (2) The variable board independence (IND) is measured as the number of non-executive directors on the board at the financial year-end (Memon and Samo, 2019). IND has been considered an internal corporate governance mechanism that plays a role in curtailing managerial excesses and improving social responsibility outcomes by representing a wider array of stakeholder issues (Luoma and Goodstein, 1999). De Villiers *et al.* (2011) found a positive effect of director independence on firm environmental performance. This was also supported in the study by Rubino and

- Napoli (2020). Thus, it is expected that IND should have a priori positive (sign) with firm performance.
- (3) Firm size (FSIZE) was proxied using the average value of total assets [(opening assets + closing assets)/2]. This procedure has the advantage of taking into account variations in asset balances that occur during the year (Anazonwu *et al.*, 2018; Oraka *et al.*, 2018). Prior studies have also identified a relationship between firm size and corporate social responsibility (Khan, 2010). The argument has been that large firms are often prone to greater public scrutiny than smaller firms, and therefore attract greater attention from the media, consumers and the wider general public (Hyun *et al.*, 2016). Thus, it is expected that FSIZE should have a priori positive (sign) with firm performance.
 - (4) The variable firm leverage (FLEV) is measured as the ratio of total debts to total assets. From an agency perspective, agency costs increase with more debt financing (Jensen and Meckling, 1976). Therefore, it is expected that FLEV should have a priori negative (sign) with firm performance.
 - (5) The control variable firm age (FAGE) is proxied as the difference between the year of incorporation and the financial reporting year in consideration (i.e. the no. of years the firm has been in existence from the date of incorporation) (Kieschnick and Moussawi, 2018; Memon and Samo, 2019). Han and Kim (2020), using empirical data from 184 U.S. firms, found that the positive association between social performance and financial performance is strengthened by firm age. Therefore, it is expected that FAGE should have a priori positive (sign) with firm performance.
 - (6) The last control variable was the sales growth (SG), which is computed as the difference between current year sales and prior year sales divided by the prior year sales. Therefore, it is expected that SG should have a priori positive (sign) with firm performance.

4. Analysis and interpretation of data

4.1 Descriptive statistics

Tables 2 and 3 (available in supplementary material to article) show the descriptive information of the study variables.

4.2 Multivariate test of hypotheses

We perform fixed effects and generalised linear model (GLM) regressions on the ROA, ENV and SOP models. Specifically, the following hypotheses were tested in the multivariate analysis:

H1: There is a positive association between gender heterogeneity and the firm's economic performance.

H2: There is a positive association between gender heterogeneity and the firm's environmental performance.

H3: There is a positive association between gender heterogeneity and the firm's social performance.

4.2.1 Discussion. The *t*-statistics and corresponding *p*-value show that the sign of the FEMB was consistent with the a priori expectation of a positive coefficient. The values were also significant at $p < 0.05$. The results confirm the [first](#) and [second hypotheses](#). The results are in

support of the study by [Beji et al. \(2020\)](#) in France that found gender heterogeneity to be positively associated with human rights and corporate governance. Similarly, [Zaid et al. \(2019\)](#) in Palestine found a positive (but non-significant) effect of gender heterogeneity on CSR, while [Ali et al. \(2019\)](#) used empirical data from the cement sector of Pakistan and found a positive effect of the proportion of female in the boardroom and cost of equity using pooled and random effects regression. [Ibrahim and Hanefah \(2016\)](#) in Jordan, showed a positive association between CSR disclosure and the board attributes. Using empirical data from Nigeria, [Olaoti \(2016\)](#) also found that gender heterogeneity had a positive significant impact on ROE. However, [Fernández-Torres et al. \(2021\)](#), using empirical data from the 120 international tourism firms, found that both proportions of women and the Blau's index had a negative effect on environmental performance, which supports our findings on the Blau's index for ROA and ENV. [Burkhardt et al. \(2020\)](#) also found a positive effect of gender heterogeneity on environmental performance. In contrast, [Mohammad et al. \(2018\)](#), in Jordan, showed a negative (non-significant) relationship between the percentage of women on BoDs and top- and medium-level executive management and financial performance (ROA) of the banks. The *t*-statistics and corresponding *p*-value show that the sign of the FEMB was not consistent with the a priori expectation of a positive coefficient for the [third hypothesis](#). The significance of the FEMB variable was negative and statistically significant ($p < 0.05$), possibly because most donations for social causes in Nigeria are aggressive tax avoidance schemes, which female board members tend to resist. Interestingly, using the Blau's index, the study by [Salami et al. \(2020\)](#) found a negative significant association between gender heterogeneity and loan loss provisioning. However, this is in contrast to the study by [Ibrahim and Hanefah \(2016\)](#) in Jordan that showed a positive association between board attributes and CSR disclosure. [Oba and Fodio \(2012\)](#) also showed a positive association between the proportion of female directors and corporate philanthropy. This was also confirmed using Blau's index. In Table 4 (available in supplementary material to article), the control variables show varying degrees of influence on the ROA, ENV and SOP proxies. The variable of board size (BSIZE) had a negative coefficient in the ROA and ENV models, and the board independence proxy was positive in all models. The former is somewhat inconsistent with our expected sign, while the latter is consistent. The latter supports the study by [Salami et al. \(2020\)](#) that found a positive effect of bank size. The surrogate for firm size (FSIZE) was negative in the ROA and SOP models, but positive in the ENV model. The leverage (FLEV) had a negative coefficient, which is consistent with our a priori expectation. This is consistent with the [Jensen and Meckling \(1976\)](#) hypothesis, that as the level of gearing increases, the agency costs between shareholders and debt holders widen. The sales growth (SG) was positive in the ROA and ENV models, but negative in the SOP model. To further test the robustness of the reported results, the researchers employed the use of the Arellano-Bond dynamic panel-data estimation technique. The results showed that the ratio of female directors (PWD) to the board size was negative, while the GH variable was negative in all three models. However, the significance level of the PWD variable was not statistically significant. The results are therefore not shown for brevity.

5. Conclusion

The study investigated the relationship between gender heterogeneity and corporate sustainability of 43 manufacturing firms, listed on the Nigerian Stock Exchange. The sample period was of eight years, starting from 2011 to 2018. The RDT provided a theoretical base for the study, which was consistent with the view of the FRC Code requiring a gender-diverse board to conduct the study and explained that by improving the female boardroom participation, the corporate sustainability performance can be aligned with that of

shareholders, which is consistent with the notion that it involves the simultaneous pursuit of “economic prosperity, environmental quality, and social equity”. The gender heterogeneity proxy was the female boardroom presence, while the main dependent variables were measured using the ROA, disclosure index and social donations. The regression analysis was conducted to determine the direction of the relationship among the variables. There is a growing awareness on corporate sustainability initiatives in the Nigerian context. This follows from the growing number of sensitive consumers and social media frenzy. This calls for the present framework of male dominance to be broken down, and the influence of females in the corporate boardroom to be understood. The findings suggest, unlike prior studies, that the presence of females in the corporate boardroom affected bottom line economic performance. More so, it was effective in environmental performance aspect in the context of Nigerian manufacturing firms; however, contrarily, the effect on social performance was negative.

Of particular importance is the finding that board independence positively affects sustainability performance. This shows that the recent action of the Nigerian government to revise the Corporate Governance Code and the SEC requirement of independent director presence are beneficial and yield positive results. This, therefore, calls for more actions at promoting the presence of these independent groups to boost performance along the three dimensions. The results also showed that board size negatively affected economic and environmental performance. This implied that the presence of large BoDs does not generally translate to improved performance in the two dimensions, and rather smaller BoDs may be preferable in such instance. This is consistent with the proposition that as regulatory monitoring is weak in developing countries, smaller BoDs enhance the efficiency and effectiveness in decision-making which leads to better performance. The present study contributes to the literature by examining the issue of gender heterogeneity on this disaggregated perspective of sustainability, which is a deviation from prior studies on this issue. The study shed light on the effect of gender heterogeneity on corporate sustainability performance from a developing country perspective. The study concludes that gender is a crucial internal corporate governance factor that affects the performance of manufacturing firms.

5.1 Implications and recommendations

This study is quite important not only for advancing literature and practitioners but also for the policymakers in the context of developing countries. One of its contribution is the mixed effect of the number of female directors in the boardroom on corporate sustainability. The maximum value for the female boardroom representation in Nigeria during the study period was 5. This is noteworthy, as the Code of Corporate Governance in Nigeria did not specify a limit on the number but rather a balance of skills and expertise. This is important because now stakeholders can focus attention on the composition of the top management team as confirmed by the positive impact of female boardroom participation on economic and environmental dimensions of corporate sustainability. Another important implication of this study is the fact that information availability has been rapidly escalating in the country, leading to rising social movements and civic unrest; therefore, corporations that face negative castigations may pay a huge price of product boycott and loss of market value. Thus, the manufacturing sector needs a heightened strategic interest as a huge employer of the labour in the country, to grow and contribute to the GDP. Secondly, eroding market value would lead to loss of investor funds and returns; therefore, shareholders must put in place appropriate governance structures to boost corporate sustainability performance, and also re-examine and reassess managerial competence along these three lines. Thus, shareholders are advised to be conscious of the firm’s performance along these three lines for its potential negative influence on firm value in the long run. The concept of reporting along these three lines is also encouraged and should form part of the company’s core strategic objective. We also recommend that regulators and policymakers especially in developing countries should

further develop policies and regulations that will ensure manufacturing firms adopt appropriate governance structures. The issue of female boardroom participation should be approached from a critical synthesis of the potential beneficial impact of qualification and experience rather than mere representation. We suggest that future research may focus on data from other sectors and countries to compare and contrast the effect of gender heterogeneity as well as in identifying other factors which account for heterogeneity in the various sectors or countries. Future studies may also explore other heterogeneity aspects such as age, culture and experience effect on corporate sustainability. This can further enhance our understanding of the issue of Board heterogeneity to possibly develop other benchmarks to govern this process.

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Further reading

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Supplementary material

The supplementary material for this article can be found online.

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