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CORPORATE SUSTAINABILITY DISCLOSURE, BOARD GENDER DIVERSITY AND FIRM VALUE OF LISTED NON-FINANCIAL COMPANIES IN NIGERIA

Joel Rimamkyaten
rimamkyatenj@gmail.com
PhD Student Department of Accounting, Taraba State University, Jalingo, Taraba State. Nigeria.

Maryam I. Muhammad, PhD
Department of Accountancy, Modibbo Adama University, Yola, Adamawa State. Nigeria.

Aliyu S. Usman, PhD
Department of Accounting, Taraba State University, Jalingo, Taraba State. Nigeria.

Correspondence: Joel Rimamkyaten: rimamkyatenj@gmail.com

Abstract

This study examined effect of board gender diversity on the relationship between corporate sustainability disclosure and firm value in Nigerian listed non-financial companies. In addition to evaluating the effect of board gender diversity on these linkages, the study looks at how environmental, economic, social, and governance reporting affects business value. Data was acquired through a quantitative approach, including secondary data from annual reports and sustainability declarations of listed corporations for the period of 2014-2023. The population of the study covered 105 companies from 10 different sectors. The analysis applied regression techniques to analyze the correlations among the variables. The results show that whereas economic reporting greatly increases firm value, environmental reporting has a positive correlation with it. Improved stakeholder trust and corporate reputation are associated with social reporting, whereas increased corporate transparency is a result of governance reporting, which is especially impacted by the gender diversity of the board. According to the report, companies that disclose more about sustainability also have lower capital costs since investors are more confident. Additionally, it reveals that businesses that exhibit sound governance processes have a higher chance of drawing in long-term investments. Additionally, companies with diverse boards typically employ more thorough sustainability plans, which improve their financial results. By emphasizing the vital role that gender diversity plays in corporate governance as a facilitator of successful sustainability practices, this study adds to the body of knowledge. In order to improve sustainability results, it also recommends future study directions that examine the wider effects of gender diversity across a range of industries and support laws that encourage fair representation in corporate leadership.

Keywords: Corporate sustainability Disclosure, Firm Value, Board Gender Diversity.

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INTRODUCTION

Firm value remains a critical concern for stakeholders in the Nigerian business environment, particularly in the face of increasing economic uncertainty and competition (Jia & Li, 2020). To remain competitive and attract investments, firms must consistently enhance their operational performance. Strong performance not only boosts firm value but also attracts investors by showcasing the company's potential for sustainable growth and profitability (Prasad et al., 2022). A firm's market value serves as an indicator of managerial success concerning investment decisions made by investors. The decision to invest in a company often hinges on its perceived value. Importantly, an increase in firm value reflects management's performance over a measurable time frame (Soewarno & Ramadhan, 2020). Management's effectiveness is now evaluated not only by profit generation but also by how well the company achieves social, economic, and environmental objectives in alignment with the triple bottom line: profit, people, and planet (Andersson et al., 2022). As stakeholder demands evolve alongside technological advancements and information developments, firms must address sustainability concerns (Asokan, 2023). Therefore, organizations must focus on achieving social, economic, and environmental performance through corporate sustainability initiatives (Nassani et al., 2022).

Governance aspect of sustainability disclosures is attuned to the controlling and the monitoring of the firms' boardroom activities towards vital decision-making with regards to financial and non-financial performance (Etim et al., 2021). This component of sustainability disclosure is on corporate governance practices in the firms, which is expected to ensure that the organization is managed as it should be. Internationally studies conducted highlight growing interest surrounding corporate transparency particularly concerning sustainability disclosures—emphasizing necessity equipping stakeholders' pertinent insights regarding organizational performances tangible aspects according to a financial firm "Klynveld Peat Marwick Goerdeler" in 2015. The International Federation Accountants (IFAC) introduced frameworks consolidating key elements embedding sustainable practices into core operational DNA applicable across diverse entity sizes and complexities enabling seamless incorporation across approaches and processes reporting practices. In regions characterized by poor socio-economic governance environmental initiatives board gender diversity emerges pivotal enhancing voluntary disclosures increasing overall firm valuations (Buallay et al., 2022; Ebaid, 2022; Musa, 2023). Improved quality decisions driven primarily by boards significantly influence valuation trajectories due critical roles played by investment acquisitions, capital budgeting and operational planning reporting (Agyei-Mensah, 2023). Board effectiveness hinges diversity dimensions shaping strategic choices influencing outcomes directly impacting shareholder interests (Kyaw et al., 2022).

Gender diversity signifies equitable representation of varying genders within corporate boards fostering enhanced management capabilities—though debates persist regarding implications regarding accounting market performances associated with female directors. Increasing female representation within non-financial companies may enhance likelihood integrating sustainability considerations decision-making processes leading improved disclosures potentially boosting valuations attracting investors prioritizing responsible practices (Brahma et al., 2021). The emphasis placed upon sustainability across economic social governance environmental dimensions aligns closely profit people planet ethos encapsulated within triple bottom line framework driving necessity further investigations concerning relationships existing between these factors impacting overall valuation trajectories observed non-financial sectors Nigeria amidst complexities encountered necessitating deeper understanding implications arising from governance-focused disclosures influencing corporate performances observed today (Alodat et al., 2023).

Statement of the Problem

The current landscape of corporate sustainability reporting in Nigeria is characterized by a growing awareness of environmental issues. Companies are increasingly pressured to engage in responsible practices that mitigate their ecological footprint (El Baz et al., 2021). Despite receiving accolades for sustainability initiatives, there is skepticism regarding how effectively publicly listed firms adhere to established sustainability indicators. Global concerns about environmental degradation have led to calls for greater corporate accountability (Githiria & Onifade, 2020). Stakeholders demand transparency regarding the social impacts of corporate activities, prompting firms to shift focus from merely maximizing shareholder wealth to considering broader stakeholder interests. This shift recognizes that damaging events can adversely affect a company's reputation and financial performance.

Recognizing the importance of social and environmental responsibility can facilitate long-term growth and optimize shareholder value (Oprean-Stan et al., 2020). Consequently, many firms are adopting sustainability reporting alongside traditional financial disclosures. While some countries mandate such reporting, others allow voluntary disclosures (Afolabi et al., 2022). Numerous studies have explored the relationship between sustainability disclosure and firm value, revealing mixed results (Onoh et al., 2023; Hariyani et al., 2022). Some research indicates a positive correlation between sustainability disclosures and financial performance, while others report negative impacts. This inconsistency highlights the need for further investigation into contextual factors influencing these relationships. In particular, board gender diversity may serve as a moderating variable affecting the dynamics between corporate sustainability disclosure and firm value (Yahya et al., 2021).

Objectives of the Study

This study examined the moderating effect of board gender diversity on corporate sustainability reporting and firm value of listed non-financial companies in Nigeria: The specific objectives include:

i. To examine the effect of environmental reporting on the firm value of listed non-financial companies in Nigeria.

ii. To evaluate the effect of economic reporting on the firm value of listed non-financial companies in Nigeria.

iii. To assess the effect of social reporting on the firm value of listed non-financial companies in Nigeria.

iv. To evaluate the effect of governance reporting on the firm value of listed non-financial companies in Nigeria.

v. To examine the relationship between board gender diversity and firm value of listed non-financial companies in Nigeria

vi. To examine the effect of board gender diversity on corporate sustainability disclosure and firm value of listed non-financial companies in Nigeria

Hypotheses of the Study

To achieve the objective of this research, the following hypotheses were formulated in the null form which guided the study:

i. Environmental Sustainability Disclosure has no significant effect on the firm value of listed non-financial companies in Nigeria.

ii. Economic Sustainability Disclosure has no significant effect on the firm value of listed non-financial companies in Nigeria.

iii. Social Sustainability Disclosure has no significant effect on the firm value of listed non-financial companies in Nigeria.

iv. Governance Social Sustainability Disclosure has no significant effect on the firm value of listed non-financial companies in Nigeria.

v. Board Gender Diversity has no significant effect on the firm value of listed non-financial companies in Nigeria.

vi. Board gender diversity has no significant effect on corporate sustainability disclosure and firm value of listed non-financial companies in Nigeria.

LITERATURE REVIEW

Firm Value

The concept of firm value is a fundamental aspect of corporate finance and strategic management. It refers to the market value of a company, which is determined by the present value of its expected future cash flows. Firm value is a critical measure that reflects the company's ability to generate economic profits and create wealth for its shareholders. Firm value is often considered a proxy for a company's overall performance and success (Velte, 2022). It represents the market's perception of the firm's ability to generate future cash flows and the associated risks. The higher the firm value, the more valuable the company is perceived to be by investors and the market.

Sustainability Disclosure

The concept of sustainability disclosure maintains that while a firm strives to achieve its traditional objectives of profit and wealth maximization, it is imperative that this profit is maximized through activities that seek to integrate economic, environmental, and social and governance considerations into the decision-making process (Eyo-Udo et al., 2024). Sustainability is defined as the concept of meeting the social, environmental and economic needs of the present without compromising the ability of future generations and assuring these needs are met through the adoption of corporate governance practices (Hariram et al., 2023). This definition consists of three dimensions of firm sustainability other than the economic-namely, environmental, social and governance.

Environmental sustainability Disclosure

Corporate environmental sustainability refers to a firm’s activities associated with protection of natural resources and efforts to preserve the environment. Sustainability should be defined broadly, although not so broadly as to lack specificity, but containing all the dimensions, economic, environmental, social, and governance. Sustainability also means incorporation of social, environmental and economic (Talan et al., 2020). However, to ensure that those three sustainability dimensions (social, environmental and economic) are incorporated into corporate strategy, governance practices should be implemented (Mohammed et al., 2020). Thus, sustainability disclosures cover the provision of economic, environmental, social, and governance information to enable others, who are mostly stakeholders of the company, to assess how sustainable an organization's operations are (Martins et al., 2020). Sustainability disclosure practices are also referred to as sustainability reporting or corporate social responsibility (CSR) reporting, non-financial reporting, triple bottom line reporting, or value reporting (Sebrina et al., 2023). Sustainability disclosure is described as the integration of

reporting and accounting for social, environmental and economic issues in corporate reporting or simply the "triple bottom line reporting".

Economic Sustainability Disclosure

Economic sustainability aims to keep the capital intact. If social sustainability focuses on improving social equality, economic sustainability aims to improve the standard of living. In the context of business, it refers to the efficient use of assets to maintain company profit over time. As stated by the UK Government in Annual Report 2000 on January 2001, maintaining high and stable levels of economic growth is one key objective of sustainable development, hence, abandoning economic growth is not an option. Sustainable development is more than just economic growth and the quality of growth matters as well as the quantity. Critics of this model acknowledge a great gap in modern accounting practices which do not include the cost of damage to the earth in market prices (Durán et al., 2023). A more recent approach to economics acknowledges the limited incorporation of ecological and social components in the model. New economics is inclusive of natural capital (ecological systems) and social capital (relationships amongst people) and challenges the mantra of capital that continual growth is good and bigger is better if it risks causing harm to the ecological and human system (Kaewhao, 2023).

Social Sustainability Disclosure

Social sustainability includes improving human resource related practices (e.g.) employees' training and development, employees' health and safety, diversity, equal opportunity and wage discrimination issues) (Lambe et al., 2024), addressing consumers' issues (e.g.) customers' health & safety, product labelling, communication practices, customers' complaints and compliance with product laws), protecting human rights (e.g.) freedom of association, removing child labour issues, nondiscrimination and other safety measures, etc.) (Lambe et al., 2024), and addressing other issues of broader stakeholders and community concerns such as involving the local community, reducing corruption, showing public policy concerns, discouraging anti-competitive behavior, and complying with the law. The concept gained prominence as a result of the ethical perspective of the organizations which recognized the value of social responsibilities in addition to their prime objective of wealth maximization.

Governance Sustainability Disclosure

Sustainability in governance refers to the firm's implementing principles to assist the stakeholders in monitoring controls, solving conflicts of interest and enforcing transparency (Nurlan et al., 2019). Good corporate governance ensures that rules, regulations and laws, particularly those associated with economic, environmental and social issues, are followed and that corrective action is implemented to maintain the firm's long-term sustainability (Ogunkan, 2022). A well governed firm in terms of corporate performance assists the management in using the resources efficiently and improving performance, hence increasing the stakeholders' trust in the firm's profitability, continuity and sustainability. Therefore, corporate governance is a crucial dimension of sustainability, as it assures a firm's sustainability (Cooray et al., 2020) Governance sustainability disclosure incorporates a firm's implementation of principles to assist the stakeholders in monitoring controls, solving conflicts of interest and enforcing transparency (Elaigwu et al., 2024). Governance sustainability disclosure subsists good corporate governance which captures the rules, regulations and laws, particularly those associated with economic, environmental and social issues, ensuring that they are followed, and that corrective action is implemented to maintain the firm's long-term sustainability (Lepistö et al., 2023). By adopting governance practices, firms can sustain themselves over the long term as these governance practices assure that

their operations are on the right track; can anticipate and resolve governance-related problems, such as implementing anti-corruption, anti-extortion and anti-bribery initiatives; and can integrate sustainability into management decisions (Shilongo, 2023).

Board Gender Diversity

Board gender diversity (BGD) refers to the representation of women on corporate boards and is a significant aspect of overall board diversity. Imade (2019) defines board gender diversity as the variation in personal characteristics among board members, which includes gender among other attributes. Gender diversity has emerged as a critical component of effective corporate governance practices, as it promotes equitable and fair business judgment and enhances firm performance (Musa, 2023; Panjwani & Saxena, 2023). In Malaysia, the Securities Commission has prioritized gender diversity as a strategic initiative to improve corporate governance among public listed companies, setting a target of 30% women directors at the board level (Abidin et al., 2024). The benefits of women's participation in leadership roles are well-recognized, with scholars noting that gender-based differences offer diverse perspectives on leadership styles, with female leaders often exhibiting empathy and gentleness (Cucari et al., 2020; Onyinye et al., 2022).

Empirical Review

Environmental Sustainability Disclosure and Firm Value

Yang et al (2020) examined the impact of environmental information disclosure on the firm value of listed manufacturing firms in China. Based on a panel dataset composed of the listed manufacturing firms in China from 2006–2016, the study used the difference-in-differences (DID) model and the propensity score matching (PSM) method to investigate whether the Environmental Information Disclosure Measure (for Trial Implementation; EIDMT) affected the firm value. The results showed that EIDMT exerted a significant impact on the listed manufacturing firms' value. The previous study was done in China hence issues of external validity may arise as a result of differences in the legal and operating environments of the countries of domain. While the previous study utilized the DID and PSM models, the current study utilized the multiple regression technique and this may result in differences in the results.

Economic Sustainability Disclosure and Firm Value

Aliyu et al (2024) investigated the moderating role of information asymmetry in shaping the effect of economic and social sustainability reporting on the firm value of listed manufacturing companies in Nigeria. Utilizing an ex-post facto research design, the study draws on a stratified sample of 29 manufacturing firms from a population of 43 listed on the Nigerian Exchange Group as of December 31, 2022. Spanning from 2007 to 2022, the study collects secondary data from annual reports, Nigeria All Share Index reports, and sustainability reports. Employing descriptive and inferential statistics, along with multiple regression techniques, the analysis considers Firm value (FV) as the dependent variable, Economic sustainability reporting (ECO) and social sustainability reporting (SOC) as independent variables, and Information asymmetry (IA) as the moderating variable. Results indicate that economic sustainability reporting has a positive but insignificant effect on the firm value of listed manufacturing companies in Nigeria. In contrast, social sustainability reporting displays a negative and significant impact on firm value. Notably, information asymmetry shows a positive and significant effect on the relationship between social sustainability reporting and firm value, while it exhibits a positive but insignificant effect on the relationship between economic sustainability reporting and firm value. The study recommends that Nigerian manufacturing should enhance social sustainability reporting to mitigate information asymmetry and bolster firm value and should also improve economic

sustainability reporting through the implementation of measures to reduce information asymmetry for long-term sustainable value creation.

Social Sustainability Disclosure and Firm value

Hasan et al, (2018) investigated the mediating role of total factor productivity in the link between corporate social responsibility and increased shareholder value creation, illuminating the underlying processes by which CSR leads to higher shareholder value creation. Researchers found that good corporate citizenship significantly boosted Tobin's Q. There is a strong positive correlation between productivity and performance. The mediation study further demonstrates that total factor production has a crucial role in mediating the CSPCFP connection. Using a coding index method, Khlif et al. (2015) analyze a sample of 168 firm-year observations from 2004-2009 in South Africa and Morocco to determine the level of social and environmental disclosure in annual reports and the correlation between this disclosure and financial performance. Their result showed that social and environmental disclosure significantly improves a company's financial success.

Governance Sustainability Disclosure and Firm Value

Platonova et al. (2018) explored the relationship between corporate sustainability performance (CSP) and corporate firm performance (CFP) for a sample of the top 500 Indian firms covering the period from 2008 to 2018. A causality design was used and the CSP variables considered were both aggregate and disaggregate levels of environmental, social and governance performance. Analysis of data was conducted to determine the bidirectional causality and intensity of the CSP-CFP relationship using the Granger causality test and multiple regression for panel data. Again, there was a sectoral level trend analysis dividing the firms in various industries and classifying them in ESI vs non- ESI sectors. The findings from the study indicated the absence of causality among CSP and CFP variables in either direction or suggested that the CSP-CFP linkage is mostly insignificant for Indian firms at the aggregate level. At an individual firm level, some negative association was found between CSP and CFP. This relationship was also shown to have an adverse impact on CSP-CFP linkage in both cases, which means that Indian firms don’t get the financial performance benefits of investments made for sustainability.

Board Gender Diversity and Firm Value

Aji and Andesto (2022) in their study aimed at determining the effect of gender diversity on governance structure on the sustainability disclosure level and its impact on firm value, used public companies listed on the Indonesia Stock Exchange (IDX) for the 2016-2020 period as the research population with sample determination using the purposive sampling method and Sampling using a purposive sampling method. Based on the criteria, as many as 40 public companies were selected as samples with a total of 200 data. The data analysis method used multiple linear regression analysis with software STATA v.16.0. The test results show that gender diversity in the governance structure of the board of directors, the audit committees, and the board of commissioners has no significant effect on the sustainability disclosure level. Meanwhile, only the gender diversity of the audit committees has a significant effect on firm value, while the gender diversity of the board of directors and the board of commissioners do not affect the firm value. The results also show that the sustainability disclosure level is not able to mediate the effect of gender diversity on the governance structure of the board of directors, the board of commissioners, and the audit committees to the firm value.

Theoretical Review

Stakeholder Theory

This study was anchored on the stakeholder theory which was propounded by Freeman in 1984. It is one of the major approaches to social, natural and administrative investigation. Scholars portray stakeholders as "those people who can influence or be influenced by the activities associated with trade" or as "the people who depend on the firm to attain their individual objectives and on whom the firm depends on for its existence". The idea of stakeholder theory began to receive significant attention in organizational and management research after the publication of Strategic Management: A Stakeholder Approach by Edward Freeman in 1984. The theory refers to how business works at its best, and how it can work. It is about value creation, trade and how to manage the business effectively. The stakeholder theory argues that firms have a moral obligation to consider and appropriately balance the interest of all stakeholders (Freeman, 1984). Successful firms protect the interest of different stakeholder groups such as: shareholders, creditors, employees, suppliers, customers, communities and the public (Freeman, 1984). The stakeholder theory has fundamentally become a basis of knowledge for companies to secure their relationship with stakeholders through social and environmental reporting. Sustainability reporting is considered as a strategic approach by which organizations denote stakeholders' participation and reduce information asymmetry. It has been recognized that organizations that consider stakeholders' requirements tend to show a better performance than those which do not (Waheed & Zhang, 2022). This theory relates to the study since sustainability reporting is the incorporation of environmental, societal and economical aspects of an organization to reporting and communication of vital information to a wider stakeholder base of the organization (Bini & Bellucci, 2020). This vital information has proven to be a useful tool for promoting firm performance.

From the theory, corporate social disclosure is a vital tool for organizations to communicate their sustainability efforts and engage with stakeholders, thereby reducing information asymmetry (Waheed & Zhang, 2022). By incorporating environmental, social, and governance factors into their reporting, firms can enhance their legitimacy and foster trust among stakeholders, ultimately leading to improved firm performance (Bini & Bellucci, 2020). Furthermore, BGD contributes to this dynamic by introducing diverse perspectives that can influence sustainability strategies and decision-making processes. Firms that prioritize both CSD and BGD are likely to create greater value, as they align their operations with stakeholder expectations and enhance their competitive positioning in the market (Hussain, 2015).

RESEARCH METHODOLOGY

This study used quantitative research design with historical data, covering the period from 2014 to 2023. The research design is justified because the event under study had already taken place and the data are already in existence. The study relies on annual reports and accounts of the sampled firms. For this study, the targeted population comprised of all one hundred and five (105) companies in the Nigerian non-financial companies listed on the Nigerian exchange group (NGX) as at 31st December, 2023. A filtering criteria or procedure was considered for selecting the required working population. The filter is employed to eliminate some of the firms that have been delisted and non-operational as well as do not have complete records of all the data needed for measuring the variables of the study within the period (2013-2023).

Models Specification

The study specified two econometric models to determine the effects of corporate sustainability disclosure on the financial performance of listed non-financial companies on the Nigerian Exchange Group. This study modified Molly (2021) whose model is

$$TQit = \alpha + \beta 1CSPit + \beta 2BRDSIZEit + \beta 3FRMSIZEit + \beta 4LEVRGEit + \beta 5GENDIVit + \varepsilon it \ldots . 1$$

To examine the relationship between Corporate Sustainability Disclosure and Firm valueof firms and the moderating effect of gender diversity on the above relationship the model is thus modified as:

Model 1: Direct Effect Model

$$TQ_{it} = \alpha + \beta_1 ESD_{it} + \beta_2 ECSD_{it} + \beta_3 SSD_{it} + \beta_3 GSD_{it} + \varepsilon_{it}$$

Model 2: Moderator Model

$FV_{it}=a+\beta_1(ESD_{it}*BGD_{it})+\beta_2(ECSD_{it}*BGD_{it})+\beta_3(SSD_{it}*BGD_{it})+\beta_4(GSD_{it}*BGD_{it})+\varepsilon_{it}\ldots.2$

Where:

FV= Firm Value

ESD= Environmental Sustainability Disclosure

ECSD= Economic Sustainability Disclosure

SSD= Social Sustainability Disclosure

GSD= Governance Sustainability Disclosure

BGD= Board Gender Diversity

t = time

i = firm

= is the residual

DATA PRESENTATION, RESULTS AND DISCUSSION OF FINDINGS

Descriptive Statistics

Table 1: Descriptive Analysis

Variables	Mean	Standard Deviation	Minimum	Maximum
Tobin's Q	1.793	0.728	0.500	2.990
ESD	0.580	0.211	0.250	0.950
ECSD	0.644	0.223	0.200	0.950
SSD	0.570	0.222	0.250	0.950
GSD	0.637	0.183	0.250	0.976
BGD	0.194	0.091	0.048	0.400
FSIZE	8.258	0.947	4.610	9.97
LEV	0.544	0.243	0.100	0.900

Source: Generated from Stata, 2024

The mean Tobin's Q for the sample is 1.793, indicating that, on average, the market values these non-financial firms at roughly 1.8 times their book value. This positive ratio suggests that investors view these firms favorably, attributing additional value beyond their asset base, which may reflect confidence in the firm's management, growth potential, or industry

positioning. The standard deviation of 0.728 suggests a moderate spread of firm values around the mean, indicating some diversity in firm valuation. The minimum value of 0.5 and the maximum of 2.99 demonstrate that firm value ranges widely, from undervalued firms to those nearly three times their book value. This spread may reflect differences in market perception of firm performance, sustainability practices, or growth potential within the sample.

The average environmental sustainability disclosure (ESD) level among these firms is 0.580, indicating that companies report approximately 58% of the possible environmental metrics. This suggests a moderate level of transparency and commitment to environmental sustainability. The standard deviation of 0.211 reveals moderate variability in environmental disclosure, suggesting that firms in the sample differ in how much environmental information they provide to stakeholders. The range, from a minimum of 0.25 to a maximum of 0.95, indicates that some firms disclose only a quarter of the available environmental information, while others approach full transparency. This variation may reflect differences in firms' environmental strategies, regulatory compliance, or industry standards.

Economic sustainability disclosure (ECSD) has a mean of 0.644, suggesting that firms disclose about 64% of possible economic sustainability information. This higher level of disclosure relative to environmental and social aspects suggests that firms prioritize economic transparency, possibly due to its direct relevance to stakeholders' financial interests. The standard deviation of 0.223 indicates some variability in economic disclosure levels, though firms tend to be relatively consistent in this area. With values ranging from a low of 0.2 to a high of 0.95, there is substantial variation in economic disclosure levels, reflecting that while some firms disclose minimal economic information, others are nearly fully transparent. This may relate to differences in firm policies, resources, or stakeholder expectations around economic performance.

The social sustainability disclosure (SSD) variable has a mean score of 0.570, meaning that, on average, firms disclose 57% of social sustainability-related information. This moderate disclosure level suggests that firms are fairly transparent about social sustainability practices, though there is room for improvement. The standard deviation of 0.221 indicates moderate variability, suggesting some inconsistency in how firms report social practices, such as community engagement, employee welfare, or social contributions. The range, from a minimum of 0.25 to a maximum of 0.95, indicates a wide spread in disclosure levels, with some firms providing minimal social information while others are quite comprehensive. This variation may be influenced by differences in firm priorities, social impact policies, or the influence of external pressures for social transparency.

Governance sustainability disclosure (GSD) has a mean of 0.637, indicating that firms disclose approximately 64% of governance-related information. This suggests a relatively high level of commitment to transparency in governance practices, possibly due to its strong relevance to investors and regulators. The standard deviation of 0.183 shows moderate variability in governance disclosure, suggesting some differences among firms but generally consistent reporting practices. With a range from 0.25 to 0.976, there is a notable difference in governance transparency, with some firms disclosing minimal information and others providing extensive governance details. This range may reflect differences in governance structures, compliance with regulations, or pressure from stakeholders for governance transparency.

The mean board gender diversity (bgd) score of 0.194 indicates that, on average, women constitute around 19.4% of board members among the non-financial firms in the sample. This suggests relatively low gender diversity in the boardrooms of these firms. The standard deviation of 0.183 shows moderate variability in board gender diversity, meaning that there is some spread among firms, with a few having slightly higher or lower female representation. The minimum value of 0.048 and maximum of 0.4 reveal that the highest proportion of women on a board in this sample is 40%, while the lowest is just under 5%. This range reflects a significant gap in gender diversity practices, with some firms approaching a more balanced board composition while others have minimal female representation.

The average firm size, measured as the natural logarithm of total assets, is 8.258. This mean suggests a relatively large asset base across the firms, which is typical for listed companies. The standard deviation of 0.947 indicates some variation in firm size, with firms differing moderately in their total assets. The minimum value of 4.61 and maximum of 9.97 show a substantial range in firm size, with some smaller firms having lower total assets (ln value of 4.61) and larger firms with significantly more assets (ln value approaching 10). This spread reflects the diversity of firm sizes within the non-financial sector and provides context for understanding how size might impact firm value and sustainability disclosure practices.

The mean leverage ratio of 0.544 indicates that, on average, firms in the sample finance about 54.4% of their assets through debt. This moderate leverage level suggests a balanced approach to debt usage among these firms. The standard deviation of 0.243 implies some variability in leverage ratios across firms, indicating different approaches to debt financing. With a minimum of 0.1 and a maximum of 0.9, there is considerable variation in firms' reliance on debt, with some firms maintaining very low leverage (10%) while others have high debt levels (up to 90%). This range highlights the diversity in capital structures within the sample, which could influence how firms manage both risk and their sustainability initiatives.

Correlation Matrix

Table 2: Correlation Matrix

Variables	Tobin's Q	ESD	ECSD	SSD	GSD	BGD	FSIZE	LEV
Tobin's Q	1.000							
ESD	0.139	1.000						
ECSD	0.180	-0.038	1.000					
SSD	0.003	-0.019	-0.140	1.000				
GSD	-0.054	-0.132	0.097	0.007	1.000			
BGD	0.146	-0.130	0.090	-0.068	0.297	1.000		
FSIZE	0.130	0.0159	0.071	0.020	0.008	0.023	1.000	
LEV	0.168	0.070	0.009	-0.030	-0.065	-0.079	-0.012	1.000

Source: Generated from Stata, 2024

From Table 4.2 above, Tobin's Q, which represents firm value, has a weak positive correlation with most of the other variables, such as environmental sustainability disclosure (ESD, 0.139), economic sustainability disclosure (ECSD, 0.180), board gender diversity (BGD, 0.146), firm size (FSIZE, 0.130), and leverage (LEV, 0.168). These low correlation values suggest that, individually, these factors do not have a strong linear association with firm value but may contribute to it in conjunction with other variables.

Environmental Sustainability Disclosure (ESD) has a weak positive correlation with Tobin's Q and negligible correlations with other variables, including economic sustainability disclosure (ECSD, -0.038) and social sustainability disclosure (SSD, -0.019). This suggests that while environmental disclosure may slightly influence firm value, it operates relatively independently from other disclosure variables. Additionally, Economic Sustainability Disclosure (ECSD) has a weak positive correlation with Tobin's Q (0.180) and a slight negative correlation with SSD (-0.140), indicating that economic and social disclosures may represent different focuses within sustainability efforts.

Moreover, Social Sustainability Disclosure (SSD) shows a very weak positive correlation with Tobin's Q (0.003) and no significant correlations with most other variables. This suggests that social disclosure might not have a linear association with firm value or other sustainability measures in this dataset. Furthermore, Governance Sustainability Disclosure (GSD) has a weak negative correlation with Tobin's Q (-0.054), suggesting that higher governance disclosure may slightly correlate with lower firm value. GSD's moderate correlation with BGD (0.297) indicates that governance disclosure may be somewhat related to board gender diversity practices.

Board Gender Diversity (BGD): BGD is positively correlated with Tobin's Q (0.146), suggesting that higher gender diversity on the board may be associated with increased firm value. BGD also shows weak positive correlations with other sustainability disclosures, notably GSD (0.297) and ECSD (0.090), implying that firms with more gender-diverse boards may also engage in more governance and economic sustainability disclosure.

Firm Size (FSIZE) has a weak positive correlation with Tobin's Q (0.130) and very low correlations with other variables, implying that larger firms tend to have higher firm value but are not necessarily more aligned with any specific sustainability disclosure practices. Similarly, leverage (LEV) is positively correlated with Tobin's Q (0.168), suggesting that firms with higher leverage tend to have higher firm values, possibly due to debt being used as a growth mechanism. LEV shows minimal correlations with the other variables, indicating its effect on firm value operates relatively independently from sustainability disclosures and board diversity.

Overall, the correlation matrix reveals that while there are weak linear associations between variables, these correlations are generally low, suggesting limited risk of multicollinearity. This supports the integrity of the regression analysis and indicates that each variable brings unique information to the model.

Regression after Moderation

Table 3: Fixed Effect Regression with Moderating Effect

Variable	Coefficient	Standard Error	Z	Probability
Constant	0.0770	0.3278	0.23	0.814
ESD	1.1064	0.1637	6.76	0.000
ECSD	0.7175	0.2654	2.70	0.007
SSD	-0.5176	0.1941	-2.67	0.008
GSD	-0.4656	0.2912	-1.60	0.110
BGD	2.0570	0.5304	3.88	0.000
ESDBGD	-0.0003	0.0001	-3.98	0.000
ECSDBGD	-0.0001	0.0001	-0.68	0.495
SSDBGD	0.0003	0.0001	3.79	0.000
GSDBGD	0.0000	0.0002	0.05	0.963
FSIZE	0.0792	0.0334	2.37	0.018
LEV	0.5013	0.1256	3.99	0.000
R-Squared		0.1642		
Wald Chi2		160.33		
Probability		0.000		

Source: Generated from Stata, 2024

The fixed effects regression in Table 3 incorporates the moderating effect of board gender diversity (BGD) on the relationship between various types of sustainability disclosure (environmental, economic, social, and governance) and firm value.

The direct effect of environmental sustainability disclosure (ESD) on firm value is positive (1.1064) and statistically significant. This suggests that firms with higher levels of environmental disclosure tend to see increased firm value, likely because investors view transparency in environmental practices as beneficial for long-term stability and risk management. However, the interaction term between ESD and BGD (ESDBGD) is negative and significant, suggesting a complex moderating effect. Specifically, as board gender diversity increases, the positive impact of environmental disclosures on firm value diminishes. This result could imply that while environmental transparency is generally valued by the market, diverse boards may shift the focus toward other areas of performance, making further environmental disclosure yield diminishing returns.

For economic sustainability disclosure (ECSD), the direct effect on firm value is also positive (0.7175) and significant, indicating that higher economic disclosure aligns with greater firm value. Investors may particularly value economic disclosures, as they often provide insights into financial stability and economic growth initiatives, which directly relate to shareholder interests. However, the interaction between ECSD and BGD (ECSDBGD) is not statistically significant, suggesting that board gender diversity does not significantly alter the relationship between economic disclosure and firm value. This outcome implies that economic disclosures positively impact firm value independently of the gender diversity on the board, perhaps because economic performance information is universally relevant to stakeholders.

The direct effect of social sustainability disclosure (SSD) on firm value is negative (-0.5176) and significant, indicating that high levels of social disclosure may be associated with lower firm value. This might reflect investor concerns about the costs associated with social initiatives, which may be viewed as less immediately beneficial to profitability. However, the

interaction term between SSD and BGD (SSDBGD) is positive and significant, indicating that as board gender diversity increases, the negative impact of social disclosure on firm value is mitigated. This could suggest that gender-diverse boards are better positioned to align social initiatives with investor expectations or communicate the long-term value of social investments more effectively to stakeholders, thereby reducing any negative perceptions associated with social disclosures.

The coefficient for governance sustainability disclosure (GSD) is negative (-0.4656) but not statistically significant, suggesting that governance disclosure alone does not have a notable impact on firm value in this sample. Similarly, the interaction between GSD and BGD (GSDBGD) is insignificant, indicating that board gender diversity does not alter the relationship between governance disclosure and firm value. This may suggest that governance disclosures, regardless of board diversity, do not play a prominent role in influencing firm value directly in this context.

The positive and highly significant direct effect of board gender diversity (BGD) itself on firm value (2.0570) highlights that diverse boards, independent of their moderating role, are associated with higher firm value. This finding supports the view that gender-diverse boards contribute positively to firm performance and market perception, possibly due to their varied perspectives and enhanced decision-making capabilities, which can drive value creation.

The coefficient for ESD alone is positive (1.1064) and highly significant ($p < 0.001$), suggesting that environmental sustainability disclosure positively impacts firm value. The interaction term (ESDBGD) between ESD and BGD, however, is negative (-0.0003) and significant ($p < 0.001$). This negative interaction implies that while environmental disclosure alone boosts firm value, its positive effect diminishes as board gender diversity increases. This could suggest that, in firms with higher board gender diversity, the benefits of environmental disclosures are either already captured or that additional disclosures have diminishing returns on perceived firm value.

The direct effect of economic sustainability disclosure on firm value is positive (0.7175) and statistically significant ($p = 0.007$), indicating that higher economic disclosure is associated with greater firm value. The interaction term (ECSDBGD) between ECSD and BGD is negative (-0.0001) but not statistically significant ($p = 0.495$). This suggests that board gender diversity does not significantly alter the effect of economic sustainability disclosure on firm value. In other words, economic disclosures positively impact firm value regardless of the level of gender diversity on the board.

In addition, the direct effect of social sustainability disclosure on firm value is negative (-0.5176) and significant ($p = 0.008$), indicating that social disclosure, on its own, is associated with a reduction in firm value. However, the interaction term (SSDBGD) is positive (0.0003) and significant ($p < 0.001$), suggesting that board gender diversity moderates the effect of social sustainability disclosure. Specifically, as gender diversity on the board increases, the negative impact of social disclosure on firm value diminishes, potentially because gender-diverse boards may be more adept at framing social disclosures in ways that align with investor expectations and reduce any perceived drawbacks.

Furthermore, the coefficient for governance sustainability disclosure alone is negative (-0.4656) but not statistically significant ($p = 0.110$), suggesting that governance disclosures may not directly impact firm value. The interaction term (GSDBGD) between GSD and BGD is also statistically insignificant ($p = 0.963$), indicating that board gender diversity does not significantly influence the relationship between governance disclosures and firm value in this

model. This lack of significance may imply that governance disclosures, whether moderated by gender diversity or not, do not have a notable effect on firm value for the firms in this sample.

Firm size (FSIZE) has a positive and significant effect on firm value (coefficient of 0.0792, $p = 0.018$), indicating that larger firms generally experience higher firm value. Leverage (LEV) also shows a positive and highly significant association with firm value (coefficient of 0.5013, $p < 0.001$), suggesting that firms utilizing more debt tend to have higher valuations, possibly due to growth opportunities funded by debt.

The model reveals that board gender diversity plays a nuanced moderating role in the relationship between sustainability disclosures and firm value. While it strengthens the positive impact of social disclosure on firm value, it has a diminishing effect on the value derived from environmental disclosures. The direct positive effect of board gender diversity on firm value highlights its independent importance. These findings suggest that gender-diverse boards can influence how certain types of disclosures are perceived by the market, potentially aligning disclosures with investor interests in complex ways.

CONCLUSION

Based on the findings, this study concludes as follows:

First, the results indicate that environmental sustainability disclosure has a positive and significant direct effect on firm value (Tobin's Q), suggesting that increased transparency in environmental practices enhances investor confidence and positively impacts market valuation.

Second, economic sustainability disclosure also shows a significant positive effect on firm value, indicating that firms with transparent economic disclosures are valued higher by the market. This finding aligns with investor priorities around financial stability and growth.

Third, social sustainability disclosure has a significant but negative direct effect on firm value, implying that extensive social disclosures may be viewed by investors as cost-intensive without immediate returns.

Fourth, governance sustainability disclosure does not show a significant direct effect on firm value, suggesting that governance transparency alone does not notably influence firm valuation among Nigerian non-financial firms.

Fifth, the interaction between board gender diversity and environmental sustainability disclosure is negative and significant, indicating that the positive impact of environmental disclosures on firm value diminishes as board gender diversity increases.

Sixth, the interaction between board gender diversity and economic sustainability disclosure is not statistically significant, suggesting that BGD does not meaningfully alter the relationship between economic disclosures and firm value.

Seventh, the interaction effect between board gender diversity and social sustainability disclosure is positive and significant, indicating that gender-diverse boards enhance the positive impact of social disclosures on firm value.

Eighth, the interaction between board gender diversity and governance sustainability disclosure is not significant, suggesting that gender diversity on the board does not alter the effect of governance disclosure on firm value.

RECOMMENDATIONS

The study recommends based on the findings that:

i. There is the need for policymakers to encourage and support standardized reporting guidelines for economic and social sustainability disclosures. Given their positive impact on firm value, policymakers should establish consistent frameworks that help companies disclose economic and social information in ways that resonate with investors and meet stakeholder expectations.
ii. Regulators should consider mandating minimum levels of environmental sustainability disclosure, especially for firms in environmentally sensitive sectors. While the positive impact of environmental disclosures diminishes with board gender diversity, basic transparency in environmental practices remains valuable for stakeholders concerned with sustainability.
iii. Managers should leverage economic and social sustainability reporting to enhance firm value. Managers should prioritize these disclosures and integrate them into their corporate strategies, as they align well with investor priorities and demonstrate corporate responsibility, contributing positively to the firm's market valuation.
iv. Corporate Governance Committees should promote board gender diversity to improve the effectiveness of social sustainability disclosures. The findings indicate that gender-diverse boards strengthen the positive impact of social disclosures, suggesting that a more inclusive board can better address and communicate social responsibility initiatives.
v. Investors should evaluate firms' social and economic sustainability disclosures as indicators of long-term stability and growth. Given the significant impact of these disclosures on firm value, investors should assess a company's commitment to social and economic transparency when making investment decisions.

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