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DETERMINANTS OF ENVIRONMENTAL SUSTAINABILITY DISCLOSURE

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Abstract
This study examined the determinants of environmental sustainability disclosure. The broad objective of the study was to examine whether board size, board gender diversity and ownership concentration determine environmental disclosure of listed oil and gas firms in Nigeria. Data were collected from published accounts of studied firms using the purposive sampling technique to select a sample size of eight (8) oil and gas firms for the study. The log-linear regression analysis was used to analyze the data obtained. Findings revealed that board gender diversity and ownership concentration have significant effect on environmental disclosure of listed oil and gas firms in Nigeria. The study concludes that concern of environmental disclosure in the financial statements of firms is fundamental and imperative. It is indispensable that the activities of the firm in the environment in which they operate in terms of finance are well documented and accounted for the users of the report to evaluate. The study recommends that size of the board should be regulated to portray the intentions of the firm to further pursue environmental disclosure course and that female board members should be incorporated into the board to balance the compassionate rationale of the board.
Keywords: Board Size, Environmental Disclosure, Gender Diversity, Ownership Concentration.

1.0 Introduction

Due to factors such as corporate stakeholder demands, regulatory pressure, and the influence of environmental groups, environmental reporting organisations have grown in popularity and significance in recent years, causing them to seek greater publicity to disclose environmental information in their annual reports (Bassey *et al*. 2013). According to Ismail *et al*. (2018), the influence of rival companies and international corporations is enhancing corporate productivity and competitiveness. The academic field of accounting has conducted extensive research on the factors influencing environmental disclosure (Gantyowati & Agustine, 2017). In the past two decades, the topic of environmental accounting has advanced significantly, going from being a relatively esoteric endeavour to one that has been tested in dozens of nations and is well

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established in a few. Although it has been discussed since the 1960s, the idea that countries should incorporate the economic function of the environment into their revenue accounting is neither an easy sell nor a rapid procedure (Atang & Eyisi, 2020).

Over the past 20 years, environmental disclosure with the help of companies has steadily grown in size and complexity (Akbas, 2014). Over the years, there has been interest in research to understand and offer a justification for this area of corporate reporting that appears to fall outside the conventional realms of accounting disclosures (Adeniyi & Fadipe, 2018). Reconfiguring overall performance indicators to integrate societal and environmental challenges as part of the conventional business purpose is a developing task in modern company activities (Ahmad & Mousa, 2010).

The main objective of this study is to examine the determinants of environmental disclosure.

However, the specific objectives include:

i. To examine whether board size determines environmental disclosure of listed oil and gas firms in Nigeria.
ii. To evaluate whether board gender diversity determines environmental disclosure of listed oil and gas firms in Nigeria.
iii. To investigate if ownership concentration determines environmental disclosure of listed oil and gas firms in Nigeria.

To achieve the above objectives, the following hypotheses are formulated and stated in null form for the research study:

i. Board size has no significant effect on environmental disclosure of listed oil and gas firms in Nigeria.
ii. Board gender diversity has no significant effect on environmental disclosure of listed oil and gas firms in Nigeria.
iii. Ownership concentration has no significant effect on the environmental disclosure of listed oil and gas firms in Nigeria.

2.0 Review of Related Literature

2.1 Conceptual Reviews

Environmental Disclosure

Environmental disclosure is the process by which a business informs various stakeholders and users of environmental information about environmental challenges and the effects of its actions on the environment so they can make an appropriate evaluation (Angela & Handoyo, 2021). It was also described by Iredele (2020) as all relevant information that is regularly conveyed to different stakeholders about environmental responsibility. The objective is to increase stakeholder knowledge of how business activities affect the environment.

Using the guidelines in the scorecard rating index offered by the Global Reporting Initiative (2009), the extent and accuracy of the information supplied in a company's sustainability reports can be used to evaluate the quality of environmental disclosure. During the Rio de Janeiro-hosted United Nations Conference on Environmental Development in June 1992, the idea of sustainability reporting gained more attention. According to Ohidoa *et al*. (2016), there has been an increase in the number of businesses in both developed and developing countries that have made environmental reporting a component or requirement in their financial and other related reports communicated annually. Intergenerational equity, environmental conservation, and the preservation of the earth's resources are all aspects of environmental disclosure that fall under the umbrella of sustainability reporting (Burgwal & Vieira, 2014).

Without a doubt, one of the most important issues facing countries today is environmental sustainability. This has been made clear by the numerous conferences and summits on climate change and global warming that have brought together the leaders of various nations to discuss the problem of environmental sustainability (Clarkson & Richardson, 2007). As a result of the negative impact that businesses' actions have on the environment and the community, there is an increased emphasis on their being environmentally responsible. Rapid industrialization has helped economic growth, but it has also led to an increase in environmental problems worldwide. Indeed, as a result of their industrialization, growing nations frequently produce significant levels of environmental pollution (Fueta, 2018).

Over the past ten years, environmental disclosure has become far more common, particularly in industrialised nations. However, developing nations like Nigeria still have inadequate and developing environmental disclosure laws (Okpala, 2019). The majority of investors are dissatisfied with present environmental reporting practises and are looking for greater sustainability disclosures, according to a survey conducted by Dibia and Onwuchekwa (2015). Companies urgently need to disclose more accurate information about their environmental disclosure as a result. For stakeholders to accurately and rationally assess performance and take necessary action, environmental information must be of a high standard (Fortunella & Hadiprajitno, 2015).

Board Size

In terms of total assets, total revenue, stock market circumstances, market capitalization, and other corporate resources, board size is a gauge of the company as a whole (Gantyowati & Agustine, 2017). Comparatively speaking to unquoted small businesses, large quoted enterprises with numerous owners are more open to social reactivity and automatically garner media attention (Angela & Handoyo, 2021). This is a result of factors that are typically present in large organisations, such as employment policy, taxation, and the influence of company activities on the public and environment (Ismail *et al*., 2018). As a result, large-scale businesses are more likely than smaller businesses to engage in environmental disclosure and accountability (Gantyowati & Agustine, 2017).

Board size can be viewed as a vital corporate governance instrument that can affect the level of company voluntary disclosure, including environmental disclosure, as it is a significant determinant of board effectiveness (Holt, 2012). On the other hand, conflicting explanations are offered about the connection between board size and environmental disclosure in both the theoretical and empirical literature (Inun, 2015). According to the agency theory, having more directors on the board may increase its monitoring efficacy because larger boards have more capacity for monitoring management and a broader diversity of experience (James & Gbalam, 2013). According to Sunday *et al*. (2019), the larger board may result in an increase in the number of directors with an expertise in finance or accounting. This could improve corporate environmental disclosure.

Board Gender Diversity

The gender diversity of the board has been seen as a crucial aspect of corporate governance that might affect the level of environmental disclosure because women and men have historically had different cultural and social backgrounds (Sulaimana *et al*., 2014). According to Rabi (2019), women can contribute to corporate boards by forming partnerships, being ready and involved, participating in significant decisions, taking on leadership responsibilities, and being visible.

However, it is impractical to expect a single director to be aware and informed about all aspects of business, given the range of experience, information, and accessibility that is needed to understand and control today's complex enterprises (Khlif *et al*., 2015). In order to improve corporate governance, board diversity has been advised by academics such as Naseer and Rashid (2018), and Obasanho (2017). According to some academics, board diversity is a demographic phenomenon involving factors like age, gender, and ethnicity. However, according to others (Hoang *et al*., 2016), board diversity is a structural phenomenon involving factors like CEO duality, board independence, and director ownership. Diversity resulting from variances in gender, race, or cultural background improves problem-solving skills, inventiveness, and understanding of the company's market position. The finest boards are made up of people with a variety of abilities, information, knowledge, power, and free time. Board diversity is a key corporate governance (CG) instrument as a result.

Ownership Concentration

The distribution of company shares among various stockholders is known as the share ownership structure. According to Angela and Handoyo (2021), the share control mechanism of a firm has a significant impact on the quality of its environmental reporting. It is thought that the wider the stock distribution of a firm, the higher the demand for information (asymmetry of information) from different stakeholders, and the higher the quality of environmental reporting as a result. In order to reduce information asymmetry, businesses with a wide variety of stockholders are likely to provide environmental reports of a higher calibre than those with a small number of concentrated stockholders.

A mechanism that aligns the interests of shareholders and managers is the ownership structure. According to Atang and Eyisi (2020), one of the key ways a company maximises its value is through an efficient and well-designed ownership structure of its shares. A company's ownership structure can be divided into two categories based on the percentage of insiders and outsiders and institutional vs individual shareholders who possess shares. There are two schools of thinking on an efficient ownership structure. First, if insiders or managers of the company acquire a sizable amount of the entity's shares, they also become shareholders, which may be helpful in reducing agency conflicts and balancing the interests of shareholders and management. Second, the likelihood of earnings management is decreased because outsiders who hold a significant portion of the company's shares have more influence and motivation to oversee management activities, particularly the financial reporting process (Ebraheem & Mohamad, 2012).

The nature of ownership of a company's equity shareholding is related to ownership structure, a subset of corporate governance. A corporation's ownership structure should be viewed as an endogenous result of choices that reflects the effect of shareholders and trading on the stock market. When shareholders of a publicly traded business approve a new secondary distribution and the owners of a privately held company elect to sell shares, it is implied that both actions are changing the ownership structure of their respective companies (Abubakar & Moses, 2020).

2.2 Theoretical Framework

Stakeholder Theory

A theory of organisational management and corporate ethics called the stakeholder theory addresses morality and values in managing an organisation. Ian Mitroff first described it in full in his 1983 San Francisco-published book "Stakeholders of the Organisational Mind". Stakeholder theory has been successful in challenging conventional analysis frameworks in domains like accounting, finance, law, management, and human resources by advocating that businesses put stakeholders' needs first in all decisions they make (Baalouch *et al*., 2019).

Voluntary Disclosure Theory

Trireksani and Djajadikerta (2016) created the theory of voluntary disclosure, which is founded on the perspective of agency theory and clarifies the quality and quantity of corporate social and environmental disclosure. The stakeholder and legitimacy theories are useful in defining what information businesses reveal in regard to the environment, but the voluntary disclosure theory went one step further by defining "how much" reporting of environmental actions is anticipated. According to Brammer and Pavelin

(2006), the voluntary disclosure hypothesis predicts that as a result of the quality of reporting of environmental operations, the information risk for existing and potential investors will decrease. One advantage of the voluntary disclosure idea is that it gives businesses a competitive edge by highlighting ecological programmes and the effects of activities on the environment. This study is anchored on this theory because firms that are doing well will not fail to disclose all environmental related issues because, they believe in what they are doing and also the interest on the host community is uppermost in their programmes. They are open to criticisms as these will enable them take corrective actions.

2.3 Empirical Review

Board Size and environmental disclosure

Angela and Handoyo (2021) looked into how firm characteristics affected the calibre of environmental disclosure. Company size, ownership concentration, company age, and leverage are the variables utilised as proxy measures of a firm's characteristics. Thirty-three (33) listed companies having regular sustainability reports on the Indonesia Stock Exchange from 2014 to 2016 were included in the study's application of content analysis of the sustainability report. The simultaneous test's findings revealed that only leverage has a statistically meaningful impact on the calibre of environmental reporting.

Atang and Eyisi (2020) looked at the factors that affect how manufacturing companies that are quoted on the Nigerian stock exchange report their environmental impact. Ex post facto study approach was used, and inferential and descriptive statistics were employed to help generalise the findings. The outcome of the multiple regression showed that profitability, board composition, business size, and auditor type all have an impact on environmental reporting in Nigerian manufacturing enterprises.

In their study, Baalouch *et al*. (2009) looked at the impact of many variables that affect the calibre of environmental disclosure. The factors taken into account include the existence of an environmental committee, an environmental audit, gender diversity, board independence, environmental performance, and the level of pollution.

One hundred twenty (120) French listed firms from 2009 to 2014 make up the study's sample. The study created its own index to evaluate the standard of environmental disclosure, and panel data specification was used as the econometric method. The outcome demonstrated that factors influencing the quality of environmental disclosure include gender diversity, environmental performance, and environmental audit.

Ofoegbu *et al.* (2018) used information from the annual reports of 213 South African and 90 Nigerian environmentally sensitive enterprises for the year 2015 to assess the impact of board characteristics on the volume of environmental disclosure. Stakeholder theory and legitimacy served as the study's foundation. The outcome demonstrates that the level of environmental disclosure is highly influenced by board independence and board size. The study, however, has some flaws because time effect was not taken into account and cross sectional data were used.

Board gender diversity and environmental disclosure

Using information from 34 listed mining companies in China between 2000 and 2018, Agyemang (2020) investigated the effect of board characteristics on environmental disclosure. According to the results of a multiple regression analysis, board independence and board size both significantly improve the disclosure of environmental accounting information. While there is little correlation between the publication of environmental accounting information and the presence of foreign nationals or ladies on board.

121 publicly listed companies from 11 Middle East and African countries were used in Kilincarslan *et al.* (2020) empirical study on the effect of governance structure on environmental disclosure. The study took place between 2010 and 2017. According to empirical findings, board independence has a substantial negative link with environmental disclosure whereas board size and gender diversity have a considerable favourable impact.

Emmanuel *et al.* (2018) used content analysis on the annual reports of 17 listed manufacturing enterprises in Nigeria from 2012 to 2016 to empirically study the impact of corporate diversity on corporate social environmental disclosure. The results of the stepwise regression analysis show that the number of women on the board and foreign directors have a substantial favourable impact on the disclosure of the corporate social environment. Board independence, however, has a negligible correlation.

Ownership concentration and environmental disclosure

121 publicly listed companies from 11 Middle East and African countries were used in Kilincarslan *et al.* (2020) empirical study on the effect of governance structure on environmental disclosure. The study took place between 2010 and 2017. According to empirical findings, board independence has a substantial negative link with environmental disclosure whereas board size and gender diversity have a considerable favourable impact.

Rabi (2019) used Agency theory to support a study on the association between board characteristic and environmental disclosure in Jordan. Panel data were collected from the annual reports of 63 listed industrial enterprises in a sample from 2014 to 2017. The outcome of the regression analysis showed that board size has a significant and favourable impact on environmental disclosure. Board independence, however, has no impact on Jordan's level of environmental disclosure. However, the study was carried out in a nation with a different regulatory framework than what is available in Nigeria, and it also took a four-year time frame into consideration, which can also be improved.

Ismail *et al.* (2018) looked at the variables that affect the calibre of corporate environmental disclosure. The following characteristics are hypothesised to influence business performance: firm size, proximity to the market, business kind, foreign ownership, ownership concentration, institutional ownership, state ownership, leverage, profitability, multi-nationality, association membership, and environmental certification. A content analysis and scoring index scheme was used in the study to evaluate the annual financial reports of a sample of 116 oil and gas companies in 19 developing nations. According to the findings, five out of the twelve variables—company size, leverage, foreign ownership, and profitability—are statistically substantially correlated with corporate environmental disclosure.

3.0 Methodology

The ex-post factor research design is used in this study due to the fact that the variables cannot be manipulated by the researcher. This method was adopted since social scientific research problems do not lend themselves to experimental and controlled inquiry of the ex-post factor kind.

The population of this study consists of Nigerian listed companies on Nigerian Exchange Group (NGX) as at 31st December, 2021. The population comprises of one hundred and fifty six (156) firms listed on Nigerian Exchange Group.

Since the entire listed firms cannot be used for the study, the study is limited to eight (8) oil and gas firms listed on Nigeria Exchange Group. The basic criteria of selecting these firms are the capitalization prowess and their specialization. In selecting the sample, purposive sample technique was used to derive the sample size. The purposive sampling was used to ensure that the sample represents a diversity of perspectives.

The secondary source of data collection was used for this study where data was gathered from audited annual reports of selected listed oil and gas companies in Nigeria. However, for the purpose of this study, ten (10) years annual reports of eight (8) selected oil and gas firms were adopted.

The study used regression analysis to investigate the impact of independent variables on dependent variable. A log-linear regression model was used to establish the significance of the model. The results obtained from the model are presented in tables to aid and ease the analysis.

The study employed log-linear regression technique of analysis using Least Squares regression estimation. This method was adopted because it enhances easy presentation and interpretation of data.

The empirical model of the study is mathematically expressed as follows;

$_{log}ENV_{it}$ = $\beta + \beta_1\, _{log}BZ_{it} + \beta_2\, _{log}BGD_{it} + \beta_3\, _{log}OWC_{it} + \mathcal{E}_{it}$
B_0 = Constant
β_1- β_3 = Coefficient of parameters estimated
ENV = Environmental Disclosure
BZ = Board Size
BGD = Board Gender Diversity
OWC= Ownership Concentration
$\mathcal{E}_{it}$ = Error term

4.0 Data Analysis and Discussion of Results

This section focuses on the analysis, and discussion of findings. The log-linear analysis was conducted and inference drawn from it. Summary of the regression results from the SPSS output were presented in a tabular form, from where detailed analysis and discussion of the result was given.

The analysis begins with a wide range of summary statistics on dependent variable and independent variables with mean, standard deviation, skewness and kurtosis presented below.

Table 1: Summary of Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Err	Statistic	Std. Err
ENV	80	.00	1.00	.2000	.40252	1.529	.269	.345	.532
BZ	80	4.00	16.00	8.9000	2.62220	.621	.269	.472	.532
BGD	80	.00	33.33	11.7332	9.20491	.294	.269	-.620	.532
OWC	80	.00	78.20	15.7688	22.27839	1.419	.269	.753	.532
N	80								

Source: Output of data analysis by author using SPSS (2023)

From table 1, the dependent variable Environmental Disclosure (ENV) has a mean value of 0.2000, standard deviation of 0.40252, minimum value of 0.00 and maximum of 1.00. The independent variable board size (BZ) has a mean value of 8.900 and a standard deviation of 2.6222, a minimum and maximum value of 0.621 and 0.269 respectively. Board gender diversity (BGD) has a mean value of 11.7332, standard deviation of 9.2049, minimum value of 0.00 and maximum value of 33.33. Ownership concentration (OWC) has a mean value, standard deviation, minimum and maximum values of 15.7688, 22.2784, 0.00 and 78.20 respectively.

Table 2: Coefficient of Correlation

		ENV	BZ	BGD	OWC
ENV	Pearson Correlation	1	-.053	-.028	-.016
	Sig. (1-tailed)		.321	.402	.443
	N	80	80	80	80
BZ	Pearson Correlation	-.053	1	-.238*	-.203*
	Sig. (1-tailed)	.321		.017	.036
	N	80	80	80	80
BGD	Pearson Correlation	-.028	-.238*	1	.107
	Sig. (1-tailed)	.402	.017		.173
	N	80	80	80	80
OWC	Pearson Correlation	-.016	-.203*	.107	1
	Sig. (1-tailed)	.443	.036	.173	
	N	80	80	80	80

*. Correlation is significant at the 0.05 level (1-tailed).
Source: Output of data analysis by author using SPSS (2023)

Table 2 shows the 1-tailed correlation analysis of the variables at 0.05 level of significance. The table shows that environmental disclosure (ENV) is negatively and significantly correlated with board size (BZ), negatively and significantly correlated with board gender diversity (BGD) and negatively and significantly correlated with ownership concentration. This implies that a significant increase in environmental disclosure (ENV) will most likely result in a decrease in board size (BZ). Table 2 also indicates that board size (BZ) is positively and significantly correlated with board gender diversity (BGD) and ownership concentration (OWC).

Table 3: Summary of Regression result

Equation 1	Multiple R	.072
	R Square	.005
	Adjusted R Square	-.034
	Std. Error of the Estimate	.409

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value	Sig.
		B	Std. Error	Beta			
1	(Constant)	.321	.200		1.610	0.000	.111
	BZ	-.010	.018	-.068	-.567	.005	.573
	BGD	-.002	.005	-.042	-.353	.0000	.725
	OWC	.000	.002	-.026	-.220	-.220	.826

a. Dependent Variable: ENV

Source: Output of data analysis by author using SPSS (2022)

The cumulative adjusted R^2 (0.34) which is the multiple coefficient of determination gives the proportion or percentage of the total variation in the dependent variable as explained by the independent variables jointly. Hence, it signifies that 5% of the total variation in environmental disclosure of the sample firms is caused by the proxies of determinants of environmental disclosure used in this study. This indicated that the model is fit and the explanatory variable are properly selected, combined and used. The findings have theoretical, practical and regulatory significance. This significance represents the contributions of the study which are expected to benefit the existing body of knowledge within the accounting and finance research, regulators and providers of accounting services. This suggests that similar efforts in other sectors especially food and beverages and Nigerian deposit money Banks would be rewarding in encouraging the management to appropriately manage their liquidity for optimum return. This will further enhance the reliability of the finance sources for better economic efficiency.

5.0 Conclusion

This study revealed the need for firms to take as a matter of necessity to include in their financial account environmental disclosure. Concern of environmental disclosure in the financial statements of firms is fundamental and imperative. It is indispensable that the activities of the firm in the environment in which they operate in terms of finance are well documented and accounted for the users of the report to evaluate.

Environmental information is a key element of corporate disclosure where it attracts stakeholders concern due to agitations as well as low quality reporting in Nigeria. These agitations are due high level of environmental pollution in Nigeria as it is considered among the largest polluted country in the world via the release of carbon from the company that operated in the Nigerian society. Overall, it is shown from the study that effective monitoring by board members significantly influences the quality of environmental disclosures.

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5.1 Recommendations

The following recommendations are hereby made:

i. Size of the board should be regulated to portray the intentional of the firm to further pursue environmental disclosure course.

ii. Female board members should be incorporated into the board to balance the compassionate rationale of the board.

iii. Efforts should be made to improve on the level of data collection, integrity and maintenance in developing countries in Africa to enable richer and more accounting research to be undertaken in these areas.

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