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## **BOARD MECHANISMS AND ENVIRONMENTAL DISCLOSURE QUALITY OF LISTED OIL AND GAS FIRMS IN NIGERIA**

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### **Abstract**

*This study investigates the impact of board mechanism on environmental disclosure quality in Nigeria. Content analysis was employed on annual reports of seven listed oil and gas companies on Nigerian Stock Exchange over an eight-year period (2012-2019). Panel corrected standard error (PCSE) regression analysis was used to examine the results. The findings indicate that board independence, board gender diversity and board expertise have a significant positive impact on environmental disclosure quality. However, board size and board nationality has an insignificant relationship with environmental disclosure quality. In conclusion, the findings support the study's general claim that effectiveness in board monitoring positively influences the quality of environmental information disclose to stakeholders. Based on the findings obtained in this study, we recommend that Governance codes regulators in Nigeria should emphasize or increase specific minimum characteristics for independence, gender diversity and expertise of the board member as they aid effective monitoring of the board and improves the credibility of information reported to the stakeholders.*

**Keyword:** environmental disclosure quality, board mechanism, environmental sensitive firms, Nigeria

### **1. Introduction**

Environmental sustainability is undoubtedly among the most crucial matter confronting nations worldwide. This is evident in the series of conferences and summits on climate change and global warming, where leader of several countries have convened to address the issue of environmental sustainability. There is an increasing emphasis on companies to be environmentally responsible in response to the adverse effects of their actions on the atmosphere and community. Although rapid industrialization has aided economic development, it has also resulted in a rise in environmental issues around the globe. Indeed, emerging countries tend to generate large amounts of environmental pollution on a regular basis as a consequence of their industrialization (Fueta, 2018).

Among others, Nigeria has been identified as one of those countries with a high level of environmental pollution that contributes significantly to global environmental problems. Nigeria, among others, has been recognized as a country with a high degree of environmental issues, which greatly contribute to the global environmental problems. According to the 2019 World Bank Global Gas Flaring Reduction Partnership, Nigeria is the world's seventh highest gas flaring nation. Additionally, Nigeria has the largest percentage of pollutants caused by air

pollution in Africa (Health Effects Institute, 2019). Similarly, AirVisual 2018 World Air Quality Report identified Nigeria as the tenth most polluted nation in the world. Many of these environmental issues are the result of the actions and activities of companies intended in meeting financial needs of their stakeholders. These environmental problems are mostly attributed to oil companies in form of gas flaring; oil spills and environmental pollution amongst others (Obasanjo, 2017) however they pay less attention to environmental issues thus many agitations by stakeholders against the companies were raised.

This situation triggered an increase in stakeholders concerned with the attitude of firms toward environmental issues (Leszczynska, 2010). This increasing concerns about the environmental impact of the business activities has led firms to examine, monitor, and try to minimize their overall environmental footprint (Adams & Frost, 2008). Companies are therefore required to reveal their interference function in mitigating the detrimental impact of their actions on individuals and the climate in their yearly report (Okpala, 2019)

Environmental disclosure practice has grown significantly over the last ten years, especially in developed countries (KPMG, 2017). However, environmental disclosure is still weak and evolving in developing countries including Nigeria (Okpala, 2019). According to a survey made by PricewaterhouseCoopers(PWC) in 2016 revealed that most investors are dissatisfied with current environmental reporting practise and are seeking improved sustainability disclosures. As a result, companies have a pressing need to provide more reliable information about their environmental disclosure (Clarkson, Fang, Li, & Richardson, 2013). The quality of environmental information is essential to enable stakeholders make accurate reasonable assessments of performance and take appropriate action. Therefore, there is a need for more studies and research into the factors that influence quality of environmental disclosure

According to Hossain and Reaz (2007) in order to enhance environmental disclosure level, it is necessary to know the factors that influence managers' decisions on the issue of disclosure and then use these factors to predict disclosure levels and enhance the quality of non-financial report. Management decision to disclose quality environmental information is likely associated with the board of directors as they play vital role monitoring environmental issues and initiatives (Rao & Tilt, 2015).

The effectiveness of a board of directors is often linked to its composition, its independence and diversity of the board in term of gender, expertise and nationality (Ceres, 2019; Kang, Cheng, & Gray, 2007). According to Gandía (2008) a board with a greater number of representatives enhances the board monitoring roles thus raising the degree of corporate accountability and related disclosure. Likewise, independent director are typically mostly concerned with corporate environmental responsibilities (Webb, 2004).

Labelle, Makni, and Francoeur (2010) show that female supervisors are more concerned with environmentally responsible behavior and are more prone to attempt to reduce the risks associated with ESG. It is assumed that companies dominated by foreign board members are more vigilant in overseeing the company's actions and decision-making (Otuya & Ofiemun, 2018). They are more aware of the need for greater transparency on the environmental impact of the firm because of their international exposure and knowledge. Board members with relevant experience in addressing sustainable development issues are also important. Therefore, possessing professional and skilled experts on the board helps in enhancing corporate

accountability and transparency through the disclosure mechanism (Al-Shaer, H., & Zaman, 2016).

Studies on environmental disclosure have global attention with less consideration in Africa, particularly in Nigeria. In addition, despite the importance of the topic, there is limited studies on the impact of board attributes on environmental disclosure quality in both developed and developing countries around the globe (see Baalouch et al., 2019; Iatridis, 2013; Ismail et al., 2018; Rupley et al., 2012). Most researches concentrated on measuring the quantity and volume of environmental disclosure (e.g Akbas, 2016; Ofoegbu et al., 2018; Rabi, 2019; Trireksani & Djajadikerta, 2016). Hence, since disclosure quality is scanty globally, there is need for additional studies on environmental disclosure quality especially in developing countries particularly Nigeria when little effort have been made regarding the subject matter.

Therefore, in an attempt to bridge the identified gaps and overcome literature's limitations the study empirically investigated impact of board mechanism attributes (size, independence, gender diversity, expertise and nationality) on environmental disclosure quality of listed oil and gas firms in Nigeria. This study's motivation is the dearth of studies in the area of environmental disclosure quality in developing countries like Nigeria seeing the fact that Nigeria's Stock Exchange Commission (SEC) recently mandated all companies on the stock exchange to report on its environmental activities.

## **2. Literature Review and Theoretical Framework**

Agency theory is a theory that explains the relationship between agents and principal (Jensen & Meckling, 1976). Agency theory recognizes that there is a tug of war between owners or principal and managers (Kleiman, 2011). The agency problem occurs due to separation of ownership from control that creates knowledge and access to information gap between shareholders or investors and company managers. In line with agency theory information disclosure is a way of mitigating conflict of interest between shareholder and corporate manager. To avoid conflicts of interest, the principal can establish a monitoring system through which managers are disciplined to act in their interest (Bushman & Smith, 2001). Over the years, several corporate mechanisms have been adopted to address the problem of information asymmetry and minimize the conflict of interest associated with agency relations.

In this perspective, the Board represents a monitoring mechanism aimed at balancing the interest of management and shareholders in relation to both financial information and to non-financial information like environmental disclosure (Bushman & Smith, 2001; Prado-Lorenzo & Garcia-Sanchez, 2010). As a result, board monitoring serves as a way to encourage the disclosure of high quality information, thus reducing information asymmetry and the associated agency issues. Board effectiveness in its monitoring role depends on certain attribute of the board members like size, independence, expertise, and diversity.

It is argued based on agency theory that independent directors usually paid more attention to corporate social and environmental responsibility (Webb, 2004) In the same vein, Eng and Mak (2003) disclosed that if high board independency could improve not only the disclosure but also, the quality of such disclosure be it financial or otherwise and decreases the gains of suppressing the information of the disclosure. The argument supported by agency theory where it indicated that the larger the members of the board, the more the competency of the board members and quality of their activities thereby resulting to an improvement on disclosure

issues which include environmental disclosure (Cheng & Courtenay, 2006; Lim, Matolcsy, & Chow, 2007).

In addition, a more diverse board with expertise and experience will help minimize agency conflict and ensure that the resources of the owner are managed effectively. Female directors are more concerned with specific aspects of corporate responsibility and could perceive sustainability issues more carefully than male managers which could thus lead to a greater degree of environmental responsibilities (Ibrahim & Angelidis, 1995). Furthermore, foreign directors are expected to pay greater attention in environmental issues due to their international exposure.

Thus, the following hypotheses are proposed:

**H<sub>1</sub>** Board independence has a significant impact on environmental disclosure quality.

**H<sub>1</sub>** Board size has a significant impact on environmental disclosure quality.

**H<sub>1</sub>** Board gender diversity has a significant impact on environmental disclosure quality.

**H<sub>1</sub>** Board expertise has a significant impact on environmental disclosure quality.

**H<sub>1</sub>** Board nationality has a significant impact on environmental disclosure quality.

This study reviews some literature in respect of board mechanism and environmental disclosure. For example, Akbas (2016) conducted a study on impact of board characteristic on environment disclosure in Turkey from agency theory perspective. Data was collected from 62 sampled non financial Turkish firms in 2011 financial year. Ordinary least square regression analysis result shows that board size is significantly and positively related to environment disclosure with all other variables proved to be insignificant. However, the study has some deficiencies as the research was based on only one-year data and time effect was not considered.

Rabi (2019) conducted a study on the relationship between board characteristic and environmental disclosure in Jordan using Agency theory to back the study. A sample of 63 listed industrial companies was study and panel data were obtained from their annual report from 2014 to 2017. The regression result revealed that board size significantly and positively affects environmental disclosure. Board independence on the other hand has insignificant effect on the level of environmental disclosure in Jordan. The study was however conducted in a country having different regulatory regime different from what is obtainable in Nigeria and also, the study considered a four year period which can also be improved upon.

Ofoegbu, Odoemelam, and Okafor (2018) examined the influence of board characteristic on environmental disclosure quantity using data collected via annual reports of 213 South Africa and 90 Nigeria environmentally sensitive firms for the year 2015. The study was grounded base on legitimacy and stakeholder theory. The result shows that board size and board independence significantly influences extent of environmental disclosure. However, the study has some deficiencies as cross sectional data was used and time effect was not considered. Abubakar and Moses (2020) examine the effect of corporate governance attributes on environment disclosure using data collected from 20 quoted manufacturing companies in Nigeria covering 2012 to 2018. Regression result revealed that board independence has a significant positive effect while diversity in terms of nationality and expertise has no significant effect on environment disclosure of the sampled company

Trireksani and Djajadikerta (2016) empirically examined the relationship between board independence and environment disclosure practice. The study used samples of 38 listed mining companies on Indonesia stock Exchange for the individual year 2012. The regression result revealed that board size has a significant positive effect while board independence and gender diversity has no significant effect on the level of environmental disclosure. Similarly, Fortunella and Hadiprajitno (2015) also found that board independence and board size has a significant positive influence on environmental disclosure in Indonesia. However board gender has in insignificant influence on environmental disclosure. However both study could be improved upon by increasing the number of period covered.

Moreover, Emmanuel, Uwuigbe, Teddy, Tolulope and Eyitomi (2018) empirically studied impact of corporate diversity on corporate social environmental disclosure by employing content analysis on annual report of 17 listed manufacturing firms in Nigeria covering 2012 to 2016. Stepwise regression analysis result indicates that board size, female and foreign director have significant positive influence on corporate social environment disclosure. However board independence has an insignificant relationship.

Ahmad and Nosakhare (2015) utilized content analysis on annual report 229 non-financial companies in Malaysia and found that that foreign director is significantly associated with the extent of environmental disclosure. However board independence director is insignificantly associated with the extent of environmental disclosure.

Contrary to the previous studies above, Baalouch, Damak, and Khaled (2019) conducted a study on the determinant of environmental disclosure quality in France base on multiply theory framework. Data from 570 firm-year observations of listed French companies from 2009 to 2014 were obtained and content analysis was used on the annual reports to measure the quality of the disclosures. Regression analysis result showed that the board independence has significant negative impact while gender diversity has a significantly and positively influences environmental disclosure quality.

Furthermore, Rupley, Brown and Marshall (2012) investigated the determinant of environment disclosure quality Using data of 127 firms from 2000 to 2005 in United States. The result of longitudinal analysis conducted revealed that environmental disclosure quality is positively associated with board attributes of diversity, expertise and independence. However, the period covered have being overshadowed with series of economic, political and regulatory events.

Naseer and Rashid (2018) studied the impact of corporate governance on environment reporting in using content analysis on 50 non-financial firms quoted in Pakistan from 2014 to 2015. Agency and Stakeholder theory was used to underpin the study. Multiple regression analysis result showed that board independence and board size have a significant positive influence on the level of environmental reporting. While female directorship has an insignificant relationship with the level of environmental reporting

Agyemang et al. (2020) examined the impact of board characteristic on environmental disclosure using data of 34 listed mining companies in China from 2000 to 2018. Multiple regression analysis result showed that both board independence and board size have a significant positive influence on the disclosure of environmental accounting information. While both foreign nationals and females on board have an insignificant relationship with the disclosure of environmental accounting information.

Kilincarslan, Elmagrhi and Li (2020) empirically examined the impact of governance structure on environmental disclosure using data of 121 publicly listed firms from 11 Middle East Africa countries from 2010 to 2017. Empirical result shows that that board size and board gender diversity has significant positive impact on environmental disclosure while board independence has significant negative relationship with environmental disclosure.

### **3. Methodology**

The purpose of this study is to examine the impact of board board mechanism on environmental disclosure quality. As a result, correlational research design was adopted. The population of this study includes all the eleven (11) listed oil and gas companies in Nigerian as at December 31<sup>st</sup> 2019. The study used census technique by attempting to collect information on all elements in the population. However, four firms were filtered out due to unavailability of relevant data from their annual report from 2012 to 2019. Hence the study arrived at an adjusted population of seven (7) firms. The study focuses on oil and gas companies as their operational activities are perceived to pose the greatest potential threat to the natural environment. Data was extracted from their annual financial report from 2012 to 2019. In respect of time frame, it is the time of stakeholder's agitation against environmental hazard was paramount as reported by the Nigerian Minister of Environment.

The dependent variables, which is environmental disclosure quality was be measured in three steps as follows; i- a structured checklist based on the Nigeria Stock Exchange (NSE) sustainability disclosure guideline as quality indicators are constructed; ii- after the checklist then the coding system which is '0' and '1' is used; iii- finally, the disclosure quality of the social and environmental information is calculated on content analysis basis with a simple un-weighted average formula. Thus, an index is formulated from the above three steps which will be used to measure environmental disclosure quality in this study(Clarkson et al., 2008; NSE, 2018; Sunday, Fidelis, & Godwin, 2019). This is in line with the GRI and NSE guideline using annual financial reports for listed companies in Nigeria.

$$EDQ = \sum \frac{EQ}{MX DQ}$$

Where: -

**EDQ** = Environmental Disclosure Quality,

**EQ** = Environmental Quality Scores,

**MX DQ** = Maximum disclosure quality scores for this study is 12.

The explanatory variables for this study comprise five board board mechanism attriutes. Board size is measured as the total number of director on the board of a company (Rabi, 2019). Board independence is measured as the proportion of independent non-executive members to the total number of directors on the Board (Akbas, 2016). Board gender is measured as the percentage of female directors to total number of directors (Naseer & Rashid, 2018). Board Expertise is calculated as number of director with professional qualification to total number of directors (Abubakar & Moses, 2020). Board nationality is measured by the number of foreign directors who serve on the board to total number of directors (Abubakar & Moses, 2020). Profitability is used as the control variable which is measured using return on asset calculated as profit after tax to total asset of the firm at year end(Akbas, 2016). Firm Size is is measured as Natural logarithm of the firm's year-end total assets (Akbas, 2016).

On the basis of these variables, the empirical results are therefore based on the following regression model;

$$EDQ_{it} = \beta_0 + \beta_1 BSIZE_{it} + \beta_2 BIND_{it} + \beta_3 BGD_{it} + \beta_4 BEXP_{it} + \beta_5 BNAT_{it} + \beta_6 FSIZE_{it} + \beta_7 PROF_{it} + \epsilon_{it}$$

Where:

- EDQL** = Environmental Disclosure Quality;
- β0** = Intercept;
- β1 to β5** = Coefficient of the independent variables;
- β6 to β7** = Coefficient of the control variables;
- ε** = Error term;
- it** = Subscript for Panel Data
- BSIZE** = Board Size;
- BIND** = Board Independence;
- BGD** = Board Gender Diversity;
- BEXP** = Board Expertise;
- BNAT** = Board Nationality;
- FSIZE** = Firm Size;
- PROF** = Profitability.

#### 4. Result and Discussion

Data collected during the course of the study were presented and discussed in this section. The descriptive statistics, correlation matrix and inferential statistics are presented in this section.

**Table 1 Descriptive Statistics**

Variable	Obs	Mean	Std.Dev.	Min	Max
EDQ	56	.14	.125	0	.5
BSIZE	56	8	1.849	4	11
BIND	56	.053	.111	0	.5
BGD	56	.136	.094	0	.375
BEXP	56	.127	.085	0	.375
BNAT	56	.205	.206	0	.636
ROA	56	.036	.274	-.716	1.762
FSIZEmillions	56	68937	37279	18253	147237

**Source: summary of STATA Output**

The mean of environmental disclosure quality is 14% which reflects that the average environmental disclosure quality relatively low. In addition, the maximum average disclosure quality is 50%, while the minimum average disclosure quality is 0%. The standard deviation of 0.125 indicates a low variation among the listed oil and gas companies. The mean for board size indicates that the average board size is approximately 8 members with the standard of deviation of 1.849, which shows moderate variability across the listed oil and gas companies. The minimum and maximum members are 4 and 11 members respectively.

The average of board independence (BIND) across the sampled listed oil and gas firms in Nigeria within the period of the study is 5.3% and the standard deviation is approximately 11.1%. The minimum and maximum board independence of the listed oil and gas firms in



Nigeria within the period covered were 0 and 50% respectively. This implies that some firms are yet to fully comply with corporate code of 2012, which stipulated that public firms should at least have one independent non-executive director.

The average level of board gender diversity across the listed oil and gas firms is 13.6%, while deviation value of approximately 9.4% indicates that there is a moderate deviation of the data from the mean. The maximum and minimum board gender diversity of the listed oil and gas firms in Nigeria within the period covered were 37.5% and 0% respectively. The average level of board expertise across the listed oil and gas firms is 12.7%, while deviation value of 8.5% indicates that there is a moderate deviation of the data from the mean. The minimum and maximum board expertise of the listed sensitive firms in Nigeria within the period covered were 0% and 37.5% respectively.

The mean value of foreign directors across the listed sensitive firms is 20.5%, while deviation value of 20.6% indicates that there is a moderate deviation of the data from the mean. The maximum and minimum proportion of foreign director of the listed sensitive firms in Nigeria within the period covered were 63.6% and 0% respectively. The average board of the sample firms is more diverse in terms of nationality as compared to others diversity dimensions. The mean of profitability as indicated that average return on asset is 3.6% approximately. Finally, with respect to firm size, the size of the firm has minimum asset value of N18.2billions in Nigerian Naira while the maximum value own by firm in terms of size is N147billions. From the mean of the size of the firm as presented in Table 4.1 indicates that on average listed companies in Nigeria have assets with worth 68millions Naira value.

**Table 2 Correlation matrix**

Variables	EDQ	BSIZE	BIND	BGD	BEXP	BNAT	ROA	FSIZE
EDQ	1.000							
BSIZE	0.356	1.000						
BIND	0.353	-0.013	1.000					
BGD	0.594	0.385	0.318	1.000				
BEXP	0.293	0.181	0.149	0.270	1.000			
BNAT	0.054	0.208	0.113	0.151	0.217	1.000		
ROA	0.063	0.003	0.103	0.179	-0.079	-0.010	1.000	
FSIZE	0.049	0.393	-0.316	0.002	-0.490	0.135	0.008	1.000

**Source: Summary of STATA output**

From the correlation matrix table 2, it can be seen that the quality of environmental disclosure has a positive relationship with all the independent variables (Bsize, Bind, Bgd, Bexp, Bnat, Roa and Fsize). The implication is that the above variables move in the same direction with the quality of environmental disclosure. Table 2 also shows the association among the independent variables themselves. According to Gujarati (2004) a correlation coefficient between two independent variables above 0.80 is considered excessive. From the table above, it can be seen that all correlation coefficient between independent variables are below 0.80 which suggests the absence of harmful multicollinearity. To further consider the collinearity issues, this study employed Variance Inflation Factor (VIF) test to measure its magnitude in our model, where the variance factors for each variable are estimated. The results of the VIF test ranges from a minimum of 1.049 to a maximum of 1.077 which are all less than 10. To further substantiate this

claim, the mean VIF is 1.053, also confirming the absence of multicollinearity among all the independent variables of the study (Hair, Black, Babin, & Anderson, 2014).

**Diagnostic Test**

Before the conduct of the final regression, this study conducted diagnostic analysis to maintain the un-biasness of the parameters as argued by Wooldridge (2011). Among the test conducted in addition to the multicollinearity test is Hausman test to make a choice between random and fixed effect models. With the P-value of 0.0001 which is statistically significant fixed effect model is therefore considered appropriate for this study. This study also conducted a normility test on the residuals of the model using shapiro-wilk and the study found that, the residual was normally distributed as the p-value of 0.377 is statistically insignificant. While the Wooldridge test for autocorrelation in panel data was also significant (p-value 0.0298) indicating presence of auto correlation. Also the heteroskedasticity test conducted using Modified Group Wise proved significant with the p-value of 0.000, which indicates absence of homoscedacity. The presence of heteroscedasticity violates the homoscedasticity assumption and may lead to a wrong inference. This study therefore conducted panel corrected standard error (PCSE) model which overcome the both heteroskedasticity and auto correlation issues. PCSE preserves observation weighting for autocorrelation, but uses a sandwich estimator to integrate cross-sectional dependence when measuring standard errors. (Mantobaye, Moundigbaye. William & Robert, 2017). Thus, this study run the PCSE model based on the recommendation of Gujarati (2004) and finally, the PSCE model is hereby presented and discussed next.

**Panel Corrected Standard Error (PCSE) Result**

The study presents the panel corrected standard error regression result in Table 3 below.

**Table 3: Panel Corrected Standard Error regression**

Variables	Coefficient	Std. Err	p-value	VIF
BSize	0.07680	0.14320	0.592	1.691
BinF	0.01907	0.00810	0.019	1.313
BGD	0.57054	0.22570	0.011	1.441
BEXP	0.17552	0.07529	0.020	1.940
BNAT	-0.23062	0.18554	0.214	1.178
PROF	-0.0109527	0.03653	0.764	1.060
FSIZE	0.1396153	0.07283	0.055	2.306
Constant	-0.8089783	0.50516	0.109	
R-squared		0.4650		Hetttest
p-value	0.000			
Number of Obs.		56		Hausman
p-value	0.000			
Chi-square		114.49		
Shapiro-Wilk		0.377		
Prob > chi2		0.000		
Mean VIF		1.449		

**Source: summary of Stata output**

The result in table 3 shows the result obtained from the Panel Corrected Standard Error Regression (PSCEs) which was interpreted after conducting all relevant tests. The coefficient of determination R-squared was 0.4650 which indicates that about 46.5% of variation in environmental disclosure quality caused by variations in independent variables as explained by

the model. This means that board size (BSIZE) board independence (BIND), board gender diversity (BDG), board expertise (BEXP), board nationality (BNAT) and the control variables jointly explained 46.5% of environmental disclosure quality of listed oil and gas firms in Nigeria and it is statically significant at 1% as indicated with p-value of 0.0000. And the remaining 53.5 percent were due to other factors not included in the equation but measured by the error term. The chi-square value of 114.49 is significant at 1% significance level; therefore, the model is of good fit.

From the result thus, the model of the study is:

$$EDQ_{it} = \beta_0 + 0.076 BSIZE_{it} + 0.019 BIND_{it} + 0.570 BGD_{it} + 0.175 BEXP_{it} - 0.230 BNAT_{it} - 0.010 FSIZE_{it} + 0.139 PROF_{it}$$

Board size variable has a z-value of 0.54, a coefficient value of 0.076 and probability value of 0.592 which is insignificant. This shows that board size has no significant effect on environmental disclosure quality of listed oil and gas firms in Nigeria. This finding of the study is in contrast with the findings of Akbas (2016) and Rabi (2019). On this basis, we therefore fail to support the alternate hypothesis, which states that Board size has a significant impact on environmental disclosure quality of listed oil and gas firms in Nigeria.

From the Table 3 the relationship between board independence and environmental disclosure quality is positive as indicated with the coefficient of 0.019 which is statistically significant at 1% (from p-value of 0.019). This implies that increase in number of independent directors will have positive influence on environmental disclosure quality. This signifies independent board members as an important monitoring mechanism that influences management decision regarding disclosure of environment information. This finding supports the proposition of agency theory and the findings of (Abubakar & Moses, 2020; Agyemang et al., 2020; Ofoegbu et al., 2018). However it goes in contrary to the results of (Akbas, 2016; Rabi, 2019; Trireksani & Djajadikerta, 2016). On this basis, we therefore support the alternate hypothesis, which states that board independence has a significant impact on environmental disclosure quality of listed oil and gas firms in Nigeria.

The result also shows that board gender diversity has a positive and statistically significant influence on environmental disclosure quality, evidenced by coefficient of 0.570 and p-value of 0.011 which is significant at 1%. By implication, it means increase in board gender diversity will foster effectiveness of the board and improve quality of environment information disclosed. This is attributed to the fact that female directors have more concern and show more sympathy towards environmental issues. This positive and significant relation is not strange as it is consistent with findings of (Baalouch et al., 2019; Emmanuel et al., 2018; Kilincarslan et al., 2020). This provides basis for supporting the alternate hypothesis, which states that board gender diversity has significant impact on environmental disclosure quality of listed oil and gas firms in Nigeria

The result obtained above also shows that the relationship between board expertise and environmental disclosure quality is positive and statistically significant. This is evidenced by the coefficient 0.175 and p-value of 0.020 which is significant at 5%. The positive relationship means that increase in board expertise will lead to a corresponding increase in quality of environmental disclosure. This is because oversight functions performed by such members hold fast more to the related affirmed measures, laws and guidelines, which in turn enhances transparency of environmental information disclosed. This result is in line with the study of

Rupley et al. (2012). This provides basis for supporting the alternate hypothesis, which states that board expertise has significant impact on environmental disclosure quality of listed oil and gas firms in Nigeria.

Board nationality variable has a coefficient value of -0.230 and probability value of 0.214 which is insignificant. This shows that board nationality has no significant effect on environmental disclosure quality of listed oil and gas firms in Nigeria. This finding does not support the proposition of agency theory and the findings (Abubakar & Moses, 2020; Agyemang et al., 2020). On this basis, we therefore fail to support the alternate hypothesis, which states that board nationality has a significant impact on environmental disclosure quality of listed oil and gas firms in Nigeria.

## **5. Conclusion and Recommendations**

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. The main objective of the current study is investigates the impact of board mechanism on environmental disclosures quality of listed oil and gas firms in Nigeria.

Overall, it is shown from the study that effective monitoring by board members significantly influences the quality of environmental disclosures. Findings from the study showed that higher percentage of independent non-executive directors, female director and directors qualified in accounting and/or finance on the board significantly improves the quality of environmental information disclosed. Neither board size nor board nationality shows a significant association with environmental disclosure quality.

The findings of this study give more understanding on the determinants of environmental disclosure quality in emerging countries like Nigeria. In spite of the importance of our finding, our research has some limitation like other empirical studies. Firstly, the sample of the study only consisted of listed oil and gas firms. Further studies can be conducted in other sectors such as manufacturing or financial service sector. In addition, the investigation relied solely on content analysis of information presented in annual reports. Further research may explore using alternative ways to collect data such as stand-alone report or corporate website rather than only annual reports.

These limitations do not undermine the validity of the results. They function as building blocks for new research. Based on the empirical findings obtained in this study, we recommend that Governance codes regulators like Security and Exchange Commission should emphasize or increase specific minimum characteristics for independence, gender diversity and expertise of the board member as they aid effective monitoring of the board and improves the credibility of information reported to the stakeholders.

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