

DETERMINANTS OF ENVIRONMENTAL DISCLOSURE OF QUOTED OIL AND GAS FIRMS IN NIGERIA

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Abstract: This study ascertained the determinants of environmental disclosure of quoted Oil and Gas firms in Nigeria for a period of thirteen (13) years spanning from 2008 to 2020. Specifically, this study ascertained the relationship between Leverage, Firm Size and Audit Committee Size and Effluent Disclosure. Panel data were used in this study, which were obtained from the annual reports and accounts of eleven (11) sampled quoted Oil and Gas firms for the periods 2008-2020. *Ex-Post Facto* research design was employed. Descriptive statistics of the dataset from the sampled firms were used to describe using the mean, standard deviation, minimum and maximum values of the data for the study variables. Inferential statistics using Pearson correlation coefficient, Multicollinearity test, Panel Least Square (PLS) regression analysis and Hausman test were applied to test the hypotheses of the study. The results of the tested hypotheses revealed that there is a significant and positive relationship between Leverage and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_1 = 0.546845$; P-value = $0.0000 < 0.05$); there is a significant but negative relationship between Firm Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_2 = -0.030633$; P-value = $0.0026 < 0.05$); there is a significant and positive relationship between Audit Committee Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_3 = 0.08007$; P-value = $0.0000 < 0.05$). The study recommended amongst others that oil and gas firms should be encouraged to leverage on debt source of fund in order to build wealth with other people's money so as to enable the firms get more involved in environmental development.

Keywords: Leverage, Firm Size, Audit Committee Size, Effluent Disclosure

Background to the Study

The environment is a vital concern in today's ecological, social and economic set up and environmental accounting disclosure has emerged extensively in response to issues of global concern, such as gas flaring, greenhouse warming effects, water pollution and other negative environmental impacts. Environmental damage is evident from the extent of greenhouse gas emissions that cause the earth's temperature to rise. In recent years, the increasing popularity and significant of environmental reporting organization on the determinants of environmental disclosure seek to receive greater publicity to disclose environmental information's in their annual reports due to reasons linking the demands by corporate stakeholders pressure from regulations, the power of environmental groups, the influence of competitors and multinational companies and improving corporate productivity and competitiveness (Hossain, Adams & Walker, 2021).

Environmental sustainability is a crucial issue for many countries, including Nigeria, where the economy relies heavily on exploiting natural resources, majorly oil exploration. The stakeholders expect transparency and accountability from corporate activities through environment information disclosure though, issuing sustainability reporting by the firms in Nigeria is voluntary. Corporate environmental disclosure is a part of social reporting and the environmental disclosures are mainly non-financial in nature. These disclosures are important, because they provide environmental performance information and influence capital markets (Okudo & Ndubuisi, 2021). Therefore, corporate investors and other stakeholders need to use environmental information in their decision-making. To enhance the environmental compliance, firms are also required to reveal information publishing their activities on the environment and how they tackle these impacts and what is the outcomes of their effort.

Nigeria is the largest oil and gas producer in Africa. Nigeria's economy and budget has been largely supported from income and revenues generated from the petroleum industry since the 1960. Nigeria's oil sector contributes to about to about 9% of the entire countries GDP. Environmental accounting is the identification, allocation and

evaluation of material streams and their associated cash flows via the use of environmental accounting structures to provide insight in environmental impacts and associated financial effects. Environmental accounting idea emphasizes on the proposition that company has obligations to society which is beyond making profit. This idea outline the responsibility of the firm's decision makers to make choices and act in approaches that recognize the relationship between the firm and the society, consequently it is vital for firms to continue its commitment to behave ethically and make contributions to environmental sustainability whilst making its profit, therefore, understanding the determinants of environmental information disclosure quality is relevant to be conducted. It is against this backdrop, that this study seeks to investigate the determinants of environmental disclosure in oil and gas firms in Nigeria.

Statement of the Problem

There is a growing concern that investment decisions, and the financial market broadly, do not appropriately reflect all the ingredients that go into creating high performing organizations. This concern has been understood by some market participants including regulators, business associations, analysts and investors who think that investment decisions and business valuations could be enhanced if they properly reflect environmental, social and governance (ESG) risks that often tag along with them (Okudo & Amahalu, 2021). However, whilst some market actors see the need to incorporate environmental, social and governance (ESG) into investment decisions as opportunities for new market/product creations, some others are yet to fully come to terms with it. Also, another major challenge is to ascertain the factors that determine environmental disclosure which has remained a puzzle to so many firms. Meanwhile, guidelines for conducting and reporting social and environmental responsibility have not been issued explicitly by the Nigerian government so that the environmental reporting remains voluntary. This voluntary report causes the format, content, and disclosure of the report varies across the companies in Nigeria. Several extant literatures have examined the factors that determine environmental disclosure yet no consensus has been reached. For example, Solikhah and Maulina (2021) posited that media coverage and awards have a significant positive effect on the quality of environmental disclosure, while financial performance has no effect on the quality of environmental disclosure. Kalash (2020) found that firm size, financial leverage, profitability, industry type, information asymmetry, investment opportunities, and business risk are determinants of environmental disclosure. Nzekwe, Okoye and Amahalu (2021) evidenced that industry type has positive and significant relationship with environmental disclosure. Ofoegbu, Odoemelam, and Okafor (2018) demonstrated that negative relationship exists between leverage firm and environmental disclosure. The divergent views of these strand of literatures created a gap in literature which this study tends to fill, hence, the need for this study.

Objectives of the study

The main objective of the study is to assess the determinants of environmental disclosure of quoted oil and gas firms in Nigeria.

The specific objectives are to:

- i. To determine the relationship between leverage and effluent disclosure of quoted oil and gas firms in Nigeria.
- ii. To examine the relationship between firm size and effluent disclosure of quoted oil and gas firms in Nigeria.
- iii. To assess the relationship between audit committee size and effluent disclosure of quoted oil and gas firms in Nigeria.

Research Hypotheses

To accomplish the objectives of the study, the following null hypothesis were formulated and tested;

H₀₁: There is no significant relationship between leverage and effluent disclosure of quoted oil and gas firms in Nigeria.

H₀₂: There is no significant relationship between firm size and effluent disclosure of quoted oil and gas firms in Nigeria.

H₀₃: There is no significant relationship between audit committee size and effluent disclosure of quoted oil and

gas firms in Nigeria.

Conceptual Review

Leverage

Financial leverage is the use of debt to buy more assets. Leverage is employed to increase the return on equity (Hayes, 2021). Leverage is the use of debt (borrowed capital) in order to undertake an investment or project. The result is to multiply the potential returns from a project. At the same time, leverage will also multiply the potential downside risk in case the investment does not pan out. When one refers to a company, property, or investment as "highly leveraged," it means that item has more debt than equity. Leverage is an investment strategy of using borrowed money specifically, the use of various financial instruments or borrowed capital to increase the potential return of an investment. Leverage can also refer to the amount of debt a firm uses to finance assets. Leverage results from using borrowed capital as a funding source when investing to expand the firm's asset base and generate returns on risk capital. Investors use leverage to multiply their buying power in the market (Mbonu & Amahalu, 2021).

Firm Size

A firm is a for-profit business organization such as a corporation, limited liability company or partnership that provides professional services (Ecowas, Omojolaibi, Oladipupo, & Okudo, 2019). A firm means an organization that owns, manages and controls a plant or number of plants and also arranges for the marketing of products, provision of finance, and other facilities to run the organization. The firm owns the land on which the plant or establishment is situated, the building along with the machines and equipment installed in it and the raw materials, the semi-finished and finished goods of the plant (Amahalu & Obi, 2020). The size of a firm means the scale or volume of operation turned out by the firm. The size of business refers to the scale of organization and operations of a business enterprise.

Audit Committee Size

An audit committee is made of members of a company's board of directors and oversees its financial statements and reporting. Audit committee is a committee of the Board of Directors whose role typically focuses on aspects of financial reporting and on the entity's processes to manage business and financial risk, and for compliance with significant applicable legal, ethical, and regulatory requirements (Nwafor & Amahalu, 2021). An audit committee size is the minimum and maximum number of members an audit committee is required to have. The Committee is to include at least 3 members, all of whom are non-executive directors and a majority of which are independent. The Chair of the Committee is to be independent and not the Chair of the Board. At least one member is to have relevant qualifications and experience. In Nigeria, the Companies and Allied Matters Act, 1990 states that a public limited liability company should have an audit committee (maximum of six members of equal representation of three members each representing the management/ directors and shareholders) in place (Omojolaibi, Okudo & Shojobi, 2019).

Environmental Disclosure

Environmental Disclosure means the disclosure, notification or reporting of information in relation to any Soil or Groundwater Contamination by or on behalf of the Purchaser to any Environmental Authority or other Third Party. Environmental disclosure is a form of corporate responsibility to the society as a result of activities which emerging a negative impact on the environment. Environmental Disclosure (ED) is the accountability of fulfilling the information needs of the company for investors, shareholders, customers, and other parties (Oshiole, Elamah & Amahalu, 2020). Environmental Disclosure means information provided to the Acquirer in the form of the Environmental Materials, and all such further information obtained through investigations of the Divested Business by the Acquirer and inquiries made by the Acquirer prior to the Closing Date as it considered prudent and appropriate, including information and records relating to the Divested Business responsible for Environmental Matters (Okudo, Omojolaibi, & Oladele, 2021). Environmental reporting and disclosure practices are a means of communicating to the stakeholders about the impact of the organization's actions on the environment.

Effluent Disclosure

Effluent is sewage that has been treated in a septic tank or sewage treatment plant. It is also referred to as trade effluent or wastewater (Darus, Zuki & Yusoff, 2020). Effluent is waste other than waste from kitchens or toilets, surface water or domestic sewage. It can be produced and discharged by any industrial or commercial premises. Effluent is an outflow of water or gas to a natural body of water, from a structure such as a sewage treatment plant, sewer pipe, industrial wastewater treatment plant or industrial outfall. It is produced and discharged by any industrial or commercial premises, such as a food processing factory or manufacturing business. Effluents are harmful when they enter the environment, especially in freshwater, because of their polluting chemical composition (Ezeokafor & Amahalu, 2019; Tuser, 2020).

Leverage and Environmental Disclosure

Leverage shows how much the firms depend on creditors in financing the business operation. A firm with a moderate level of financial leverage is expected to disclose its environmental commitment towards assuring the populace that the firm is financially buoyant. Leverage is employed to increase the return on equity. However, an excessive amount of financial leverage increases the risk of business failure. Egbunike and Tarilaye (2017); Omabu, Okoye and Amahalu, (2021) found financial leverage to have a positive influence on firm's willingness to disclose voluntarily its Environmental activities. Handoyo and Angela (2021) suggest that only financial leverage is valid to predict the quality of environmental disclosure. In contrary, Adeniyi and Adebayo (2018) found financial leverage to be non-significant to firms' voluntary disclosure of Environmental Information. Ofoegbu and Odoemelam (2018) established that firms' commitment to voluntary disclosure of Environmental Information in the published annual report is not induced by level of its financial leverage. Kiende and Karambu (2016) revealed that financial leverage has no significant effect on voluntary Environmental Disclosure (ED) by listed firms.

Firm size and Environmental Disclosure

Firm size is among determinant factors of firm performance and particularly shows the profitability of business. Empirical researchers also consider firm size an important and fundamental firm characteristic, and that firm size matters in determining the dependent variables. For example, Chouaibi and Chouaibi (2021) show that pecking order is only found in large firm. Shabbir and Wisdom (2020) discover that leverage increases with firm size. In mergers and acquisitions, Abiahu, Egbunike, Udeh, Egbunike and Amahalu (2019) find that small firms have larger abnormal announcement returns; Huang (2021); Amahalu & Obi, (2020b) document that cash offers decreases with firm size, but for stock offers, they find an inverted-U relation between them. Handoyo and Angela (2021) revealed that firm size has a non-significant effect on the quality of environmental information disclosure.

Audit Committee Size and Environmental Disclosure

The major responsibility of audit committee is to assist the board of directors in overseeing corporate reporting policy (Achraf, El-Ammari and Bouri, 2021). Audit committee size refers to the number of members in the audit committee. A larger audit committee size is willing to devote greater resources and authority to effectively carry out their responsibilities (Fulop, 2019). More directors on audit committee are more likely to bring diversity of views, expertise, experiences and skills to ensure effective monitoring (Ndulue, Okoye & Amahalu, 2021). A higher number of audit committee members are likely to help such committee to uncover and resolve potential issues in corporate reporting process (Abdullah, Ismail & Smith 2018). Audit committee size is an integral factor for audit committee to adequately oversee corporate disclosure practices (Huang, 2021). Mbonu and Amahalu (2021b) found no significant association between audit committee size and the environmental disclosure.

Theoretical Review

Stakeholders Theory

In 1984, R. Edward Freeman originally detailed the Stakeholder Theory of organizational management and business ethics that addresses morals and values in managing an organization. Stakeholder Theory is a view of capitalism that stresses the interconnected relationships between a business and its customers, suppliers,

employees, investors, communities, environmental groups, governmental groups and others who have a stake in the organization. The theory argues that a firm should create value for all stakeholders, not just shareholders. The stakeholder theory is a theory of organizational management and business ethics that accounts for multiple constituencies impacted by business entities like employees, suppliers, local communities, creditors, and others. It addresses morals and values in managing an organization, such as those related to corporate social responsibility, market economy, and social contract theory. It emphasizes the interconnections between business and all those who have a stake in it, namely customers, employees, suppliers, investors and the community (Lin, 2018). Stakeholder theory suggests that shareholders are one of many groups a corporation or organization must serve. Under stakeholder theory, anyone that is affected by the organization or its workings in any way is considered a stakeholder.

Empirical Review

Atang and Eyisi (2020) investigated the determinants of environmental disclosures of listed manufacturing firms in Nigeria. The data for the study was gotten from a sample of 22 listed firms in the industrial sector. The companies were randomly selected based on the availability of annual reports for the period 2011 to 2016. Ex post facto research design was adopted for the study and multiple regressions was used in analyzing the data obtained. Descriptive and inferential statistics were used to generalize the results and conclude the findings. The study showed that an increase in the profitability of manufacturing firms will lead to a 1.8% increase in the environmental disclosure of the company. The study also revealed that board composition influences about 13% of the variation in the environmental disclosure of manufacturing firms in Nigeria and also on the other hand auditor type contributes only 5.6% of the changes in the environmental disclosure of the manufacturing firms in Nigeria. The study concluded that profitability, auditor type, board composition and firm size jointly influences the environmental disclosure of manufacturing firms in Nigeria. The study recommended that the regulatory bodies should initiate policies that will make the disclosure of environmental information compulsory in Nigeria.

Nkwoji (2021) investigated the relationship between environmental accounting and Profitability of selected quoted oil and gas companies in Nigeria from 2012-2017. The study specifically examined the relationship between environmental expenditure and Net profit of quoted oil and gas companies in Nigeria. Explanatory, historical and correlational design was adopted for the study while secondary data was utilized for the study. Data were gathered from annual reports and accounts of the companies available on their websites and from Nigerian Stock Exchange. The Annual reports includes, annual financial statements; annual sustainability reports as well as Annual Reports of global tax payment to nations by the quoted oil firms, annual returns submitted at Nigerian Stock Exchange for the years under study. Regression was used for data analysis and testing of the hypothesis. The study showed that there was no significant relationship between environmental expenditure and net profit of the oil and gas companies in Nigeria under study. The study recommended that amongst others that the management of the oil and gas companies should channel efforts towards engaging in adequate environmental spending and its disclosure as way of increasing stakeholders trust and showing more transparency in their operations which could in turn lead to achieving better financial performance seen in terms of its profitability.

Handoyo and Angela (2021) examined the relationship between a firm's characteristics and environmental disclosure quality. Firm's characteristics used in the study were size, ownership concentration, age, and leverage. Content analysis of sustainability reporting was applied in this study. The study involved 33 listed firms in Indonesia Stock Exchange (IDX) that were consistently issued sustainability reporting during 2014-2016. Simultaneous test indicated that characteristics of the firm significantly explained the variance of environmental disclosure quality, also partial test showed that leverage was the only variable significantly influenced by environmental disclosure quality.

Salawu, Mamman, Dahiru, Garba and Yunusa (2021) examined the relationship of specific oil and gas firms attributes; firms age, board composition, financial performance, existence of foreign directors on the board and financial leverage with Environmental Disclosures (ED). Data were collected from the published annual reports of nine listed oil and gas firms quoted on the floor of the Nigerian Stock Exchange (NSE) as at 2018, for a period of seven years (2012-2018). Generalized Least Square (GLS) was used to test the hypotheses. The study established a positive and significant relationship between board composition, financial leverage, existence of foreign directors on the board and environmental disclosure (ED). Also, firm age and financial performance was found not to have significant relationship with environmental disclosure (ED).

Methodology

Research Design

The research design that was employed in this study is *ex-post facto* research design.

Population of the Study

The population of this study consisted of all the twelve (12) oil and gas companies listed on the Nigerian Stock Exchange as at 31st December, 2020. They include: 11 Plc (formerly Mobil Oil Plc); Anino International Plc; Capital Oil Plc; Conoil Plc; Eterna Plc; Ardova Plc (formerly Forte Oil Plc); Japaul Oil & Maritime Services; MRS Oil Nigeria Plc; Oando Plc; Rak Unity Petroleum Company Plc; Seplat Petroleum Development Company Plc; Total Nigeria Plc.

Sample Size and Sampling Technique

The sample size of this study comprised of eleven (11) listed oil and gas firms in the Nigeria Stock Exchange (NSE) from 2008 to 2020. Purposive sampling technique was adopted to select oil and gas companies that consistently filed their annual reports with the Nigerian Stock Exchange for the study period (2008-2020), these are: 11 Plc (formerly Mobil Oil Plc); Anino International Plc; Capital Oil Plc; Conoil Plc; Eterna Plc; Japaul Oil & Maritime Services; MRS Oil Nigeria Plc; Oando Plc; Rak Unity Petroleum Company Plc; Seplat Petroleum Development Company Plc; Total Nigeria Plc.

Source of Data

This study basically utilized secondary data that were extracted from the annual reports and statements of account of the sample listed oil and gas companies.

Operationalisation of Variables

Table 1: Variable Description

Variable Type	Indicators	Variable Symbols	Definition and Measurement
Independent Variable (Determinants)			
	Leverage	LEV	$\frac{\text{Total debt}}{\text{Total shareholders equity}}$
	Firm Size	FSZ	measured as natural logarithm of the firms total assets
	Audit Committee Size	ACS	Measured as the total number of audit committee members
Dependent Variable (Environmental Disclosure)			
	Effluent Disclosure	ED	$\frac{\text{Total effluent score disclosed}}{\text{Maximum number of Effluent disclosure score that a firm could disclose}}$
Control Variable			
	Profitability (ROA)	ROA	$\frac{\text{Net Income}}{\text{Total Assets}}$
	Board Size	BSZ	the total number of directors on the board of each sample firm

Method of Data Analysis

Inferential statistics of this study was carried out using: Pearson Correlation Analysis, Multicollinearity Test, Panel Least Square (PLS) regression analysis, Hausman Specification Test. Moreover, content analysis was adopted in

this study. This study adopted the Global Reporting Initiative (GRI) framework disclosures according to the G4 guidelines for the purpose of developing the Environmental disclosure indices. Environmental Reporting was evaluated by 21 indicators (refer to appendix I).

For each of these sustainability reports, all the 21 indicators were scored as follows:

- a score of 0 for an item not referred to in a report;
- a score of 1 when the report only briefly mentioned something pertinent to the item or provided only qualitative statements;
- a score of 2 when the report provided detailed information with some numerical support; and rarely
- a score of 3 was given when a report provided extensive numerical support with data on goals achieved or fully accomplished.

So, a total score for environmental disclosure could reach the maximum score of 36.

Therefore,

$$EDI = TDP / MP$$

Where;

EDI = Environmental Disclosure Index

TDP = Total Disclosure Points of a Firm

MP = Maximum Points for a Firm

Model Specification

In order to test for the relevance of the hypotheses regarding the Determinants of Environmental Disclosure of Oil and GAS firms listed on the Nigerian Stock Exchange. This study adapted the model of Geerts, Doms and Stas (2021):

$$EHSD = \beta_0 + \beta_1 FSZ + \beta_2 PROF + \beta_3 IND T + \epsilon \dots\dots\dots (1)$$

Where:

EHSD = Employee Health and Safety Disclosure

FSZ = Firm Size

PROF = Profitability

INDT = Industry Type

ϵ = error term

To test for H₁, H₂, and H₃, this study estimated the following regression equations based on the formulated hypotheses:

$$ED_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 FSZ_{it} + \beta_3 ACS_{it} + \beta_4 PROF_{it} + \beta_5 BSZ_{it} + \mu_{it}$$

Where:

β_0 is the intercept of the regression.

$\beta_1, \beta_2, \beta_3$ are the coefficients of the regression

ED_{it} = Effluent Disclosure of firm i in period t

LEV_{it} = Leverage of firm i in period t

FSZ_{it} = Firm Size of firm i in period t

ACS_{it} = Audit Committee Size of firm i in period t

$PROF_{it}$ = Profitability of firm i in period t

BSZ_{it} = Board Size of firm i in period t

i = individual firms (1,2,3...11)

t = time periods (2008, 2009 ... 2020)

μ_{it} = Error term

Data Presentation and Analysis

Table 2: Pearson Correlation Matrix

	ED	LEV	FSZ	ACS	PROF	BSZ
ED	1.0000					
LEV	0.4026	1.0000				
FSZ	-0.2888	0.0996	1.0000			
ACS	-0.1306	-0.2028	0.0904	1.0000		
PROF	0.3957	0.1040	-0.6394	0.2124	1.0000	
BSZ	0.3622	-0.1082	-0.6004	0.4688	0.4918	1.0000

Source: E-Views 10 Correlation Output, 2021

The Pearson Correlation Matrix in table 2 delineates the existence of a positive relationship between LEV (0.4026), PROF (0.3957), BSZ (0.3622) and ED. However, a negative relationship exists between FSZ (-0.2888), ACS (-0.1306) and ED.

Table 3: Test of Multicollinearity

Variance Inflation Factors

Date: 11/22/21 Time: 05:28

Sample: 2008 2020

Included observations: 13

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.371601	874.7359	NA
LEV	0.000305	10.33067	1.205175
FSZ	0.003208	790.2362	3.562841
ACS	2.595913	14.38364	2.220099
PROF	0.006876	10.59706	2.188429
BSZ	0.401061	18.96882	2.824430

Source: E-Views 10.0 output file, 2021

Table 3 shows that the variance inflation factors (VIF) for the study variables are less than 10 respectively as revealed by the values of the Centered VIF. This is an indication of non existence of multicollinearity among the variables in the model

Table 4: Panel Least Square Regression analysis testing the relationship between LEV, FSZ, ACS, PROF, BSZ and ED

Dependent Variable: ED

Method: Panel Least Squares

Date: 11/22/21 Time: 05:31

Sample: 2008 2020

Periods included: 13

Cross-sections included: 11

Total panel (balanced) observations: 143

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.490824	0.108460	4.525386	0.0000
LEV	0.546845	0.029708	18.40706	0.0000
FSZ	-0.030633	0.009989	-3.066594	0.0026
ACS	0.080075	0.011491	6.968315	0.0000
PROF	0.009562	0.003058	3.126498	0.0022
BSZ	-0.011198	0.004436	-2.524317	0.0127
R-squared	0.883383	Mean dependent var		0.194734
Adjusted R-squared	0.849930	S.D. dependent var		0.141544
S.E. of regression	0.137965	Akaike info criterion		-1.082581
Sum squared resid	2.607705	Schwarz criterion		-0.958266
Log likelihood	83.40454	Hannan-Quinn criter.		-1.032065
F-statistic	72.92529	Durbin-Watson stat		1.975680
Prob(F-statistic)	0.000000			

Source: E-Views 10 Regression Output, 2021

Interpretation of Regression Output

Table 4 shows the regression output of the determinants of environmental disclosure the result of the model is written as:

$$ED_{it} = 0.490824 + 0.546845 LEV_{it} - 0.030633 FSZ_{it} + 0.080075 ACS_{it} + 0.009562 PROF_{it} - 0.011198 BSZ_{it} + \mu_{it}$$

The model infers that 1% increase in LEV, ACS and PROF will exert 54.65%, 8% and 0.096% increase on ED of quoted oil and gas firms in Nigeria respectively. On the other hand, one unit increase in FSZ and BSZ will cause ED to reduce by 3% and 1.11% respectively. The regression result also shows that LEV ($\beta_1=0.546845$); ACS ($\beta_3=0.080075$); PROF ($\beta_4=0.009562$) have a positive relationship towards ED while FSZ ($\beta_2=-0.030633$) and BSZ ($\beta_5=-0.030633$), exhibited a negative relationship towards ED. The slope coefficients reveal that; $P(x_1=0.0000<0.05$; $x_2=0.0026<0.05$; $x_3=0.0000<0.05$; $x_4=0.0022<0.05$; $x_5=0.0127<0.05$). The model delineate that at 95% confidence level, there is a significant positive relationship between LEV, ACS, PROF and ED and a significant negative relationship between FSZ, BSZ and ED. The Durbin-Watson Value of 1.975680 buttressed the fact that the model does not contain auto-correlation, since the value is less than approximately, thereby making the regression fit for prediction purpose. The adjusted R-Squared of 0.849930 shows that 84.99% of the systematic variation in ED could be explained by LEV, FSZ, ACS, PROF, and BSZ, while the remaining 15.01% is explained by the error term as part of the ED which is not interpreted by the regression model.

Decision

Following the F-statistics of 72.92529 with an associated P-value of 0.000000 ($p<0.05$) which is less than 5%. Therefore, hypothesis H_1 is accepted while H_0 is rejected. Hence, LEV, ACS and PROF have a significant positive relationship with Effluent Disclosure, while FSZ and BSZ have a significant negative relationship with Effluent Disclosure of quoted Oil and Gas firms in Nigeria at 5% level of significance respectively.

Table 5: Hausman Test between LEV, FSZ, ACS, PROF, BSZ and ED

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
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Cross-section random

18.409550

5

0.0002

Source: E-Views 10, output, 2021

Interpretation of Post Regressed Result

The Hausman test in table 5 indicates that the Chi-Sq. Statistic value of 18.409550 with the p-value of 0.0002 is statistically significant at P-value of 0.05. Invariably, the fixed effect model (FEM) is preferable since the p-value of 0.0002 is less than 0.05. So, the null hypothesis is rejected and alternative hypothesis is accepted. Consequently, LEV, FSZ, ACS, PROF and BSZ have a statistically significant relationship with Effluent Disclosure of quoted Oil and Gas firms in Nigeria at 5% level of significance.

Findings, Conclusion and Recommendations**Findings**

In consonance with the analysis of this study, the following findings were deduced:

- i. There is a significant and positive relationship between Leverage and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_1 = 0.546845$; P-value = $0.0000 < 0.05$).
- ii. There is a significant but negative relationship between Firm Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_2 = -0.030633$; P-value = $0.0026 < 0.05$).
- iii. There is a significant and positive relationship between Audit Committee Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_3 = 0.08007$; P-value = $0.0000 < 0.05$).

Conclusion

The thrust of this study is to ascertain the determinants of environmental disclosure of quoted Oil and Gas firms in Nigeria for a period of thirteen (13) years spanning from 2008 to 2020. The proxies used to employ Determinants (the independent variable) are Leverage, Firm Size and Audit Committee Size. On the other hand, the dependent variable; Environmental Disclosure was measured using Effluent Disclosure. Panel data were obtained from annual reports and accounts of the sampled oil and gas firms for the study period, using a sample of eleven (11) quoted oil and gas firms. Regression analysis was employed via E-Views 10.0. The results of the tested hypotheses revealed that there is a significant and positive relationship between Leverage and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_1 = 0.546845$; P-value = $0.0000 < 0.05$); there is a significant but negative relationship between Firm Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_2 = -0.030633$; P-value = $0.0026 < 0.05$); there is a significant and positive relationship between Audit Committee Size and Effluent Disposal of quoted Oil and Gas firms in Nigeria at 5% level of significance ($\beta_3 = 0.08007$; P-value = $0.0000 < 0.05$).

Recommendations

Based on the findings of this study, the following recommendations were made:

- i. Sequel to the positive relationship between leverage and environmental disclosure, oil and gas firms should be encouraged to leverage on debt source of fund in order to build wealth with other people's money so as to enable the firms get more involved in environmental development.
- ii. In order to reverse the inverse relationship between firm size and effluent disclosure, oil and gas firm should not concentrate on sales growth alone, but rather on effective and efficient utilization of resources during exploration, production and marketing activities, as this may go a long way in improving a firm's profitability as well as sustainability investment.
- iii. Firms should capitalize on audit committee members that can affords them versatility, experience and comprehensive understanding of company business activities, managerial dealings and financial reporting process towards efficient environmental activities participation.

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Appendix I

Environmental Disclosures in GRI G4

Disclosure	Description	Aspect
G4-EN1	Materials used by weight or volume	Materials
G4-EN3	Energy consumption within the organization	Energy
G4-EN4	Energy consumption outside the organization	Energy
G4-EN5	Energy intensity	Energy
G4-EN6	Reduction in energy consumption	Energy
G4-EN7	Reductions in energy requirements of products and services	Energy
G4-EN8	Total water withdrawal by source	Water
G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and the areas of high biodiversity value outside protected areas	Biodiversity
G4-EN12	Description of the significant impacts of activities, products, and services on biodiversity in protected areas and the areas of high biodiversity value outside protected areas	Biodiversity
G4-EN13	Habitats protected or restored	Biodiversity
G4-EN15	Direct greenhouse gas (ghg) emissions (scope 1)	Emissions
G4-EN16	Energy indirect greenhouse gas (ghg) emissions (scope 2)	Emissions
G4-EN17	Other indirect greenhouse gas (ghg) emissions (scope 3)	Emissions
G4-EN18	Greenhouse gas (ghg) emissions intensity	Emissions
G4-EN19	Reduction in greenhouse gas (ghg) emissions	Emissions
G4-EN22	Total water discharge by quality and destination	Effluents and Waste
G4-EN27	Extent of the impact mitigation of the environmental impacts of products and services	Products and Services
G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and the transporting members of the workforce	Transport
G4-EN31	Total environmental protection expenditures and investments by type	Overall
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	Supplier Environmental Assessment
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	Supplier Environmental Assessment

Source: G4 Sustainability Reporting Guidelines, Reporting Principles and Standard Disclosures, 2021.