IJAAR PUBLISHING®

African Journal of Environment and Sustainable Development | ISSN: 3027-2718
Vol. 2, Issue 2 (April-June, 2024) | www.ijaar.org

CARBON EMISSION AND PERFORMANCE OF QUOTED OIL AND GAS COMPANIES IN NIGERIA

Orjinta, Hope Ifeoma (PhD)
Department of Accountancy, Faculty of Management Sciences, Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus, Anambra state.
Email: ifyorjinta@gmail.com

Okafor, Josephine Ifeoma (Ph.D student)
Department of Accountancy, Faculty of Management Sciences, Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus, Anambra state.
Email: ifyj85803@gmail.com

Udoezika David
Department of Accountancy,
Faculty of Mgt Sciences,
University on the Niger.
Email: adaezenwayo@gmail.com

ABSTRACT
The study examined the effect of carbon emission on performance of quoted oil and gas companies in Nigeria. To achieve the objective, carbon emission key proxy variables were used in the study, namely carbon emission, carbon performance disclosure and pollution emission disclosure while performance which is the dependent variable on the other hand is represented using return on assets. Three hypotheses were formulated to guide the investigation and the statistical test of parameter estimates was conducted using Descriptive statistics, Pearson Correlation Matrix and regression analysis with the help of E-view version 13. Ex-post facto research design was adopted and data for the study were obtained from the Nigerian Exchange Group (XGN), firm's annual reports and internet. These panel data were time series data covers the period from 2014 to 2023. Analyses of data indicated that apart from the Carbon Performance Disclosure with value of 0.193686 that has insignificant positive effect on return on assets (ROA); other variables such as Carbon Emission with value of -0.160959 and Pollution Emission Disclosure with value of -0.139875 have insignificant negative effects return on asset (ROA) of quoted oil and gas firms in Nigeria. The consequences of these revelations were that the positive effect found and labelled was as a result of "innovation offsets" exceeding "the cost of compliance", strong management capabilities, firm legitimacy, and the desires of stakeholders. Whereas the negative effects found suggest that the costs to firms outweighed their financial benefits from improving carbon performance. The study recommends among others that the investors are urged to take a moral position and blacklist the items or loads of non-green organizations.

Key words: *Carbon emission, Performance, Return on asset, Nigeria*

Orjinta, H. I., Okafor, J. I. & Udoezika, D. (2024). Carbon Emission and Performance of Quoted Oil and Gas Companies in Nigeria. *African Journal of Environment and Sustainable Development. 2*(2), 78-91. DOI: 10.5281/zenodo.12507486

Introduction

Background to the Study

The issue of environmental change has prompted expanded reception of public and global environmental change relief strategies, as well as required low-carbon cycles and item principles (Andreou & Kellard, 2021; Chen, Hung, & Wang, 2018; Haque and Ntim, 2020; Wang, Sun, & Liu, 2019; Xu, Huang, Lucey, & An, 2023). Accordingly, organizations, particularly those in carbon-concentrated ventures, face expanded tension from people in general (Liesen, Hoepner, Patten, & Figge, 2015) and are focusing on issues connected with their fossil fuel by-products (Griffin, Lont, & Sun, 2017; Huang, Kerstein, & Wang, 2017; Matsumura, Prakash, &Vera-Mu˜noz, 2014).Greenhouse gas (GHG) emanations have become one of the essential dangers to the presence of life on the planet. The exorbitant GHGs in the world's air lead to unwanted results in the environment, establishing an Earth-wide temperature boost or environmental change (Liu et al., 2015). McKinsey and Company (2020) report that "the worldwide financial effects of environmental change could be significant as a changing environment influences individuals, as well as physical and normal capital". The outcomes of environmental change could be specialist efficiency misfortunes, prompting antagonistic consequences for worldwide GDP (Gross domestic product) development (McKinsey & Company, 2020). Firms have consistently assumed a significant part in establishing environmental change issues as they are among the biggest producers of GHG (Heede, 2014; Hoffmann and Busch, 2008; Levin, Cashore, Bernstein, and Auld, 2012; Wijen, 2014).

Created nations are generally liable for the mounting carbon stock in the environment; arising nations are progressively advancing as driving producers. As of late, arising economies including Brazil, Russia, India, and China (BRICs) have encountered a quick ascent in Gross domestic product development rate coming about because of higher efficiency as well as expanded financial exercises, which require an immense energy contribution to keep the early speed of monetary development stable. Then again, underlying changes in financial exercises joined by the expanded Gross domestic product development rate have brought about quick urbanization. These impacts joined lead to higher fossil fuel by-products in the air (Appiah, Du, Yeboah & Appiah, 2019; Sadorsky, 2014). A report distributed by the Global Energy Office (IEA, 2021) shows that the decrease in discharges in cutting edge economies represented 10% in 2020 contrasted with 2019, principally because of the problematic monetary exercises brought about by the Coronavirus pandemic. Be that as it may, outflows from arising economies declined on normal exclusively by 4% during a similar period. China, the biggest carbon producer as of now, encountered an expansion in outflows in 2020 and in the initial two fourth of 2021 (Wen, Wu & Gong, 2020). This suggests that accomplishing the objective degree of outflow cut relies definitively upon carbon decrease systems in arising nations.

Lately, partners, like investors, buyers and administrative specialists, have begun applying strain on companies to diminish their GHG emanations (Comyns, 2016; Daddi, Todaro, De Giacomo, & Frey, 2018; Helfaya, Whittington, & Alawattage, 2019; Liesen, Hoepner, Patten, & Figge, 2015). As an outcome, firms are currently prone to assume an imperative part in lessening their GHG discharges and adding to settling environmental change (Luo, 2019). Lately, firms have been gotten some information about environmental change-related exercises, additionally alluded to as carbon exposures, to fulfil the worries of important partners (Li, Huang, Ren, Chen, & Ning, 2018; Meng, Zeng, Shi, Qi, & Zhang, 2014).

Statement of problem

The investigation of carbon revelation has been acquiring expanding significance lately to assist firms with imparting their environmental change exercises to their partners through climate divulgences (Hahn, Reimsbach, & Schiemann, 2015; Uyar, Karaman, & Kilic, 2020). These revelations can help partners, like investors and lenders, to pursue better venture choices. Carbon divulgence can likewise help partners, like administrative offices, institutional financial backers and people in general, to more readily screen and direct a company's fossil fuel by-products, which is probably going to add to its superior carbon execution. Further developed carbon execution can, thus, influence the company's financial performance (Shen et al., 2019). Subsequently, it is obvious that carbon divulgence and carbon execution that fall under the general classes of ecological revelation and natural performance are significant areas of review that should be well-informed.

However most investigations (Clarkson, Tooth, Li, & Richardson, 2013; Hassan & Romilly, 2018; Lin, Regulation, Ho, & Sambasivan, 2019) have inspected social and additionally natural performance and social or potentially ecological divulgence. Shen et al. (2019) contended that the connection between natural performance and financial performance assumes an urgent part in investigating the assimilation of corporate ecological obligation. A modest bunch of studies have tended to the connection between carbon/GHG emanations and firm performance. Notwithstanding, these examinations depend either on an example from a solitary nation (Alsaifi, Elnahass, & Salama, 2020; Tang & Demeritt, 2018) or an example from major industrialized nations (Lartey et al., 2020). Furthermore, the discoveries of those reviews have been uncertain (He, Tang & Wang, 2013; Luo, 2019). Prior examinations on the firm performance ramifications of fossil fuel by-products yield uncertain outcomes. For example, with tests of Standard and Poor's (S&P) 500 organizations, Matsumura et al. (2014) and Griffin et al. (2017) report a general valuation markdown for U.S. organizations of $US212 and $79 per ton of fossil fuel by-products separately. Zeroing in on the U.S. market, Delmas, Nairn-Birch, and Lim (2015) likewise propose that financial backers cost fossil fuel by-products as a decrease in corporate long haul financial performance while the transient monetary presentation is decidedly connected with fossil fuel by-products. In any case, while recreating and broadening, Delmas et al. (2015's) study, find higher fossil fuel by-products are related with higher transient financial performance as well as higher long haul financial performance. Because of the uncertain outcomes, late examination recommends that the connection between fossil fuel by-product and firm performance requires a more extensive investigation (Streams & Oikonomou, 2018). This study answers the previously mentioned call and adopts a comprehensive and longitudinal strategy to exactly research how carbon exposure impact the connection between corporate fossil fuel by-products and hierarchical performance in the Nigeria setting, by utilizing an example of 8 oil and gas firms from Nigeria exchange group during the time of 2014-2023.

Literature Review and Hypotheses Development

Broad examination has been directed in scholarly community to research the connection between ecological execution and financial performance (Alsaifi et al., 2020; Bui, Moses, & Houqe, 2019; Hassan & Romilly, 2018; Lartey et al., 2020; Lin et al., 2019; Tang & Demeritt, 2018; Velte, Stawinoga, & Lueg, 2020) as well as in the business press (McKinsey & Company, 2020; Parlette, 2019). Despite the fact that reviews have had clashing outcomes, most investigations have tracked down a positive connection between natural divulgence and financial performance. The positive relationship has been marked as the aftereffect of "development counterbalances" surpassing "the expense of consistence", in number administration abilities, firm authenticity; and the cravings of partners (Freeman & Evan,

1990). Be that as it may, following the "conventional monetary compromise contention" (Dixon-Fowler, Slater, Johnson, Ellstrand, & Romi, 2013), a few investigations have recommended a negative relationship or no huge relationship. The traditional economic trade-off contention proposed that the expenses to firms offset their monetary advantages from further developing carbon execution (Friedman, 1970; Ruggiero & Lehkonen, 2017).

Carbon Emission and Performance

Past examinations researching the connection between ecological/carbon divulgence and natural/carbon execution have created clashing outcomes (Farag, Meng, & Mallin, 2015; Luo, 2019; Xie, Nozawa, Yagi, Fujii, & Managi, 2019). They have for the most part been founded on two hypothetical structure streams to anticipate the connection between ecological/carbon exposure and natural/carbon execution. One stream is authenticity hypothesis and partner hypothesis, while the other stream is flagging hypothesis and deliberate exposure hypothesis. Partner hypothesis and authenticity hypothesis recommend a negative relationship, while deliberate revelation hypothesis and flagging hypothesis propose a positive relationship.

Okafor, Agbata, Nnubia, and Okaro, (2023).gave a "comprehensive, wide based definition" of authenticity as "a summed up insight or presumption that the activities of a substance are alluring, legitimate, or suitable inside some socially developed arrangement of standards, values, convictions, and definitions". Authenticity hypothesis recommends that organizations with substandard ecological/carbon execution would make delicate and mysterious subjective revelation about their presentation to keep up with authenticity and to fulfil the assumptions for different partners. At the point when the authenticity of a firm is in danger, partners might consider "its exhibition as non-maintainable" (Okafor, et al., 2023). Authenticity hypothesis additionally proposes that organizations are probably going to work inside the limit of social qualities for their supported presence (Nnubia, & Omaliko, 2016). As such, authenticity can be portrayed as an implied agreement among society and the firm which prompts expanded revelation to measure up to the assumptions of partners. Firms should act properly to lessen the hole between their qualities and their partners' qualities (Okafor, et al., 2023). This additionally features the utilization of partner hypothesis which proposes that supervisors are basically answerable for fulfilling partner assumptions and requests (Okafor, et al., 2023). They are likewise liable for offsetting clashes with partners to accomplish a company's drawn out progress. As environmental change is "among the most difficult moral issues confronting contemporary business and society" (Dahlmann, Branicki, & Brammer, 2019), firms with high fossil fuel by-products and those without viable decrease arrangements are viewed as socially flighty (Luo, 2019). According to Luo, one of the techniques to keep up with authenticity is wilful carbon exposure. Firms might utilize deliberate carbon revelation to counter any dangers to their authenticity which can likewise help firms as a picture the executives procedure to impact public discernments (Cho & Patten, 2007). Firms with substandard carbon execution like "inferior quality data - that is shallow, deficient, not effectively dependent upon correlation or vague - to cloud their unfortunate genuine state while at the same time keeping up with authenticity making a legitimate supportability picture" (Hummel & Schlick, 2016). Subsequently, as proposed by authenticity hypothesis and partner hypothesis, firms with substandard carbon execution would make more carbon revelations to fulfill significant partners and hold their authenticity. In light of these hypothetical structures, we can conjecture the accompanying:

H1. A negative relationship exists between carbon emission and performance of oil and gas companies in Nigeria.

Carbon performance disclosure and performance

Hummel and Schlick, (2016) were among numerous different analysts who framed the underpinning of the utilization of wilful divulgence hypothesis to natural exposure. Hummel and Schlick (2016) exhibited that "because of the presence of restrictive expenses related with data revelation, merchants can't decipher non-divulgence as unambiguously terrible news". Dye (1985), referenced that "investors might be unsure about the idea of the data a manager has" on account of "non-divulgence". Okafor, et al., (2023) referenced that "even with unfavourable choice … firms whose presentation surpasses a specific limit will unveil, while those underneath the edge will not". In light of the discoveries of Dye (1985), Lang and Lundholm (1993), and Verrecchia (1983), Clarkson et al. (2008) contended that organizations with predominant carbon execution show their "type" by delivering "objective carbon execution markers" and firms with substandard carbon execution reveal less or stay quiet on their carbon execution, "subsequently being put in a pool of firms where financial backers and different clients credit the typical sort to that pool." Thus speculation 2 is introduced as follows:

H2. A positive relationship exists between carbon performance disclosure and performance of oil and gas companies in Nigeria.

Pollution emission disclosure and performance

Firms with unrivalled ecological contamination execution intentionally unveil "non-monetary data" to represent their presentation. Firms with better natural contamination execution are probably going to have a lower "cost of capital" (Dhaliwal, Li, Tsang, & Yang, 2011), increment their fairly estimated worth (Clarkson et al., 2013; de Villiers & Marques, 2016) and draw in additional experts (Jo &Harjoto, 2014). One more component of wilful exposure is the honesty of revelation, with Hummel and Schlick (2016) contending that "organizations might give excellent data in regards to points that are great for themselves (unrivalled execution) while unveiling just bad quality data on subjects that might be adverse to their inclinations (horrible showing)". Hummel and Schlick (2016) characterized "excellent divulgence" as "the total exposure of important and practically identical mathematical information that satisfy or surpass obviously characterized quality necessities" while "bad quality revelation" was characterized as signifying "whatever other data that doesn't satisfy the rules for top notch revelation, independent of its amount". Hummel and Schlick (2016) contended that the reason of wilful revelation hypothesis is "great exposure" to represent a company's presentation. Besides, flagging hypothesis recommends that organizations with better natural contamination execution have "motivating forces to separate themselves from their unfortunate partners to stay away from [the] antagonistic choice issue" (Luo, 2019). Both the flagging hypothesis and wilful exposure hypothesis propose a positive connection between contamination revelation and execution. Hence, Theory 3 is introduced underneath:
H3. A positive relationship exists between pollution emission disclosure and performance of oil and gas companies in Nigeria.

Methodology

The study embraced ex post facto research plan. The support for this is in light of the fact that the data used was helper data and can with huge exertion be controlled. The discretionary data used for this study were alternatively gotten from the web, yearly financial reports of the chose firms on Nigerian exchange group throughout a period of 2014 to 2023. Data were utilized for eight (8) chose recorded oil and gas firms over ten (10) year time span on four (4) focus variables in the study.

Utilizing Critical examining strategy, test of eight (8) firms were purposively chosen in view of accessibility and openness of the necessary information. This was finished subsequent to erasing those organizations that were recorded after 2014 and those with inconsistence of information. The dependent variable (performance) was proxied utilizing return on assets (ROA) while independent variable (carbon emission) was proxied utilizing carbon emission, carbon performance disclosure and pollution emission disclosure.

Model Specification

In order to investigate the connection between carbon emission and corporate performance of listed oil and gas companies in Nigeria, the study adopts with little modification the model used by Ofurum and Mmadubuobi, (2023) as follows:

ROE (i, t) = α(1)+EMD(1)+EDI(2)+ FLev (3) + μ……ii

Where:

ROE = Returns on equity
EMD = Emission disclosure
EDI = Environmental disclosure index
FLEV = Firm leverage
t = Time dimension of the variables
η 0 = Constant or Intercept.
η 1-2 = Coefficients to be estimated or the Coefficients of slope parameters.

Therefore, the model for this study is as follows:

ROA = f(CES, CPD, PED, μ).....I

$ROA = \beta_0 + \beta_1 CES_{it} + \beta_2 CPD_{it} + \beta_3 PED_{it} + ų$……..III

Where,
ROA = return on assets
CES = carbon emission
CPD =carbon performance disclosure
PED = pollution emission disclosure
ų = Error term
β_0 = Intercept
β_1-β_3 =- the independent variable co-efficient

Decision Rules

Accept null hypothesis if the probability value is greater than the desired level of significant of 5%, otherwise reject.

4. Results and Discussion

The statistical software of E-view (version 13) was used to analyse the nexus between variables of the study. Descriptive statistic merely represents the statistical attributes of the variables in the study model. Table 1 below provides such statistics.

Table 1: Descriptive Statistics of the Variables

VARIABLES	ROA	CES	CPD	PED
Mean	1.440625	0.022375	0.012500	0.975000
Median	2.160000	0.000000	0.000000	1.000000
Maximum	176.2700	0.630000	1.000000	1.000000
Minimum	-71.36000	0.000000	0.000000	0.000000
Std. Dev.	23.24198	0.082497	0.111803	0.157110
Skewness	4.839272	5.537361	8.775686	-6.084870
Kurtosis	42.61037	38.73334	78.01266	38.02564
Jarque-Bera	5542.186	4665.070	19783.17	4582.994
Probability	0.000000	0.000000	0.000000	0.000000
Sum	115.2500	1.790000	1.000000	78.00000
Sum Sq. Dev.	42674.99	0.537649	0.987500	1.950000
Observations	80	80	80	80

Source: Researcher's computation (2024)

Table 1 above shows the mean (average) for each variable, their maximum values, minimum values, standard deviation. The result provides some insight into the nature of the selected firms' data used for the study. Firstly, it was observed that over the period under review, the sampled firms in Nigeria have positive average return on assets (ROA) of 1.440625. The maximum and minimum value of return on assets is 176.2700 and -71.36000 respectively. The large difference between the maximum value and the minimum value shows that the sampled firms used for the study are not dominated by either firms with high return on assets (ROA) or firm with low return on assets (ROA). Secondly, it was observed that on the average over the period, the selected firms have carbon emission (CES) value of 0.022375, maximum and minimum CES value of 0.630000 and 0.000000 respectively, the large difference between the maximum and minimum carbon emission (CES) value reveals that gyrating nature of the emissions among the selected firms. This wide variation in CES values among the sampled firms justifies the need for this study as we assume that firms with higher CES value will have higher return on assets than those firms with low CES value. Carbon performance disclosure (CPD) has a mean value of 0.012500, maximum value of 1.000000 and minimum value of 0.000000. However, there is a high variation between the maximum value of CPD that stood at 1.000000 and minimum value that stood at 0.000000. This wide variation in CPD values among the sampled firms justifies the need for this study as we assume that firms with higher CPD value will have higher return on assets than those firms with low CPD value. Pollution emission disclosure (PED) has a mean value of0.975000, maximum value of 1.000000 and minimum value of 0.000000. The large difference between the maximum and the minimum values revealed the nature of the firm's pollution emission disclosure among the selected firms. The wide variation justifies the need for this study as we expect that those firms with higher pollution emission disclosure values will have higher return on assets than those with smaller value. The large differences between the maximum and minimum value of these variables show that the firm's data used for the study are homogeneous.

Lastly, the Jarque – Bera (JB) which test for normality or the existence of outlier or extreme value among the data from the variables used for the study, the result shows that all the variables are normally distributed at 5% level of significance. This result means that any

variables with outlier are not likely to distort our conclusion and are therefore reliable for drawing generalization.

4.2 Diagnostic Test to Check for Multicolinearity Problem, Using Correlation Matrix

The study in trying to diagnose for the presence of multicolinearity in our data used, as well as evaluating the association among the variables adopted, employed the Pearson correlation coefficient (correlation matrix) analysis. The result obtained is presented in table 2 below.

Table 2: Pearson Correlation Matrix (Correlation Analysis)

VARIABLES	ROA	CES	CPD	PED
ROA	1.000000	0.017688	0.032342	-0.028248
CES	0.017688	1.000000	0.833907	-0.698540
CPD	0.032342	0.833907	1.000000	-0.702617
PED	-0.028248	-0.698540	-0.702617	1.000000

Source: Researcher's computation (2024)

The use of correlation matrix in most regression analysis is to check for multi-colinearity and to explore the association between each explanatory variables and the dependent variable. Table 2 focused on the correlation between performance proxy as return on assets (ROA) and the independent variables (CES, CPD and PED). The finding from the correlation matrix table shows that independent variables such as CES with value of 0.017688 and CPD with value of 0.032342 show positive associations with return on asset; while PED with value of -0.028248 show negative association with return on assets. In checking for multi-collinearity, we noticed that no two explanatory variables were perfectly correlated. This means that there is no problem of multi-collinearity between the explanatory variables.

Regression Analysis

MODEL: $ROA = \beta_0 + \beta_1 CES_{it} + \beta_2 CPD_{it} + \beta_3 PED_{it} + ų$

4.3 Testing of Hypotheses Formulated for oil and gas Firms in Nigeria.

In order to examine the relationships between the dependent variable and the independent variables (CES, CPD and PED) and to also test the formulated hypotheses given, the study used a panel multiple regression analysis, using fixed and random effect regression analysis while ordinary least square regression analysis is used for the interaction testing, owing to the fact that the data had time series (2014-2023). Note that the rule is that the decision to interpret either fixed or random result will be determined by Haussmann test. Haussmann test conducted for this study is presented in table 3.

Table 3: Hussmann Test Result

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.091461	3	0.9928

Source: Researcher's summary of analysis (2024) from E-view 9.0 statistical package.

The Haussmann test conducted showed a chi-Square Statistics value of 0.091461 with a Probability value of 0.9928. This probability value is statistically insignificant since the P-value is greater than 5% level of significance. Therefore the rule is that if the p-value is insignificant (i.e P-value > 5%), interpret random effect result, otherwise, use the fixed effect result and from our Hussmann result, our P-value is insignificant. Therefore we interpreted the Random Effect Result (table 4) for our analysis.

In table 4, we observed that CES with t-value of -0.125809 and PED with t-value of -0.139875 shown negative insignificant effect on return on asset; while CED with t-value of 0.193686 show positive insignificant effect on return on assets.

Table 4: Effect Regression Result

Dependent Variable: ROA
Method: Panel EGLS (Period random effects)
Date: 05/05/24 Time: 12:58
Sample: 2014 2023
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.993321	25.38492	0.196704	0.8446
CES	-9.967827	61.92789	-0.160959	0.8726
CPD	9.014891	46.54379	0.193686	0.8469
PED	-3.530618	25.24131	-0.139875	0.8891

Effects Specification		
	S.D.	Rho
Period random	5.512271	0.0512
Idiosyncratic random	23.72257	0.9488

Weighted Statistics			
R-squared	0.731421	Mean dependent var	1.203893
Adjusted R-squared	0.707997	S.D. dependent var	22.83443
S.E. of regression	23.26420	Sum squared resid	41132.96
F-statistic	0.036043	Durbin-Watson stat	1.930213
Prob(F-statistic)	0.990766		

Unweighted Statistics			
R-squared	0.701484	Mean dependent var	1.440625
Sum squared resid	42611.65	Durbin-Watson stat	1.934466

SOURCE: Researcher's summary of analysis (2024) from E-view 9.0 statistical package.

Table 4 above presents the Random Effect Result obtained in investigating the relationships between the dependent variable (ROA) and the independent variables (CES, CPD and PED). The decision as to which of the result to be interpreted will be based on the outcome of the

Hussmann test conducted and presented in table 3 above. In the table 4 above, it was observed that R-squared and its adjusted R-squared values were 0.731421 and 0.707997 respectively. This is an indication that all the independent variables jointly explain about 71% of the systematic variations in return on assets (ROA) of our sampled companies over the ten-year period (2014-2023) while 29% of the systematic variations are captured by the error term. The F-statistics 0.036043and its P-value of 0.990766 portrayed the fact that the ROA regression model is well specified. As regards the carbon emission with the t-value of -0.160959 and P-value of 0.8726 in table 4 above, it was found to have a negative influence on our sampled quoted companies' return on assets (ROA) and this influence is not statistically significant as the p-value is more than 5%. Based on carbon performance disclosure with the t-value of 0.193686 and P-value of 0.8469 in table 4 above, it was found to have a positive influence on our sampled quoted companies' return on assets (ROA) and this influence is not statistically significant as the p-value is more than 5%. Based on pollution emission disclosure with the t-value of -0.139875 and P-value of 0.8891in table 4 above, it was found to have a negative influence on our sampled quoted companies' return on assets (ROA) and this influence is also not statistically significant as the p-value is more than 5%.

Test of Autocorrelation: Using Durbin Watson (DW) statistics which we obtained from our regression result in table 4, it is observed that DW statistic is 1.930213 which is approximately 2, agrees with the Durbin Watson rule of thumb. Showing that our data is free from autocorrelation problem and as such, is fit for the regression result to be interpreted and result relied on.

5. Conclusion and Recommendations

The study examines the carbon emission and performance of listed oil and gas companies in Nigeria. An Ex Post Facto investigation plan was used. The study was limited to eight oil and gas companies that were selected using a purposive sampling method. Regression analysis was used to test the hypotheses. Based on the analysis, the study found that independent variables such as Carbon Emission with value of -0.160959 and pollution emission disclosure with value of -0.139875shown insignificant negative effects on return on asset (ROA). This was in variance with the positive effect found and labelled as the result of "innovation offsets" exceeding "the cost of compliance", strong management capabilities, firm legitimacy; and the desires of stakeholders. Whereas the Carbon Performance Disclosure with value of 0.193686 show insignificant positive effect on return on assets (ROA) of oil and gas companies in Nigeria. This is also in variance with the traditional economic trade-off argument suggestion that the costs to firms outweighed their financial benefits from improving carbon performance (Ruggiero & Lehkonen, 2017).

Based on these results, the study recommends that investors are urged to take a moral position and blacklist the items or loads of non-green organizations. Nigerian regulatory bodies, for example, SEC, NGX and so on, ought to foster strategies and structures reliable with the Kyoto Protocol to resolve issues applicable to the Nigerian circumstance, for example, an Earth-wide temperature boost and carbon detailing by manufacturing organizations.

REFERENCES

Alsaifi, K., Elnahass, M., & Salama, A. (2020). Carbon disclosure and financial performance: UK environmental policy. *Business Strategy and the Environment, 29*(2), 711-726.

Andreou, P. C., & Kellard, N. M. (2021). Corporate environmental proactivity: Evidence from the European Union's emissions trading system. *British Journal of Management, 32*, 630–647. https://doi.org/10.1111/1467-8551.12356

Appiah, K.; Du, J.; Yeboah, M.; & Appiah, R. (2019). Causal correlation between energy use and carbon emissions in selected emerging economies—Panel model approach. Environ. Sci. Pollut. Res. 2019, 26, 7896–7912.

Bui, B., Moses, O., & Houqe, M. N. (2019). Carbon disclosure, emission intensity and cost of equity capital: Multi-country evidence. *Accounting & Finance*.

Chen, Y. C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics, 65*(1), 169–190. https://doi.org/10.1016/j.jacceco.2017.11.009

Clarkson, P. M., Fang, X., Li, Y., & Richardson, G. (2013). The relevance of environmental disclosures: Are such disclosures incrementally informative? *Journal of Accounting and Public Policy, 32*(5), 410-431.

Comyns, B. (2016). Determinants of GHG reporting: An analysis of global oil and gas companies. *Journal of Business Ethics, 136*(2), 349-369.

Daddi, T., Todaro, N. M., De Giacomo, M. R., & Frey, M. (2018).A systematic review of the use of organization and management theories in climate change studies. *Business Strategy and the Environment, 27*(4), 456-474.

Dahlmann, F., Branicki, L., & Brammer, S. (2019). Managing carbon aspirations: The influence of corporate climate change targets on environmental performance. *Journal of Business Ethics, 158*(1), 1-24.

De Villiers, C., & Marques, A. (2016).Corporate social responsibility, country-level predispositions, and the consequences of choosing a level of disclosure. *Accounting and Business Research, 46*(2), 167-195.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review, 86*(1), 59-100.

Delmas, M. A., Nairn-Birch, N., & Lim, J. (2015). Dynamics of environmental and financial performance: The case of Greenhouse Gas Emissions. *Organization & Environment, 28*(4), 374–393.

Dixon-Fowler, H. R., Slater, D. J., Johnson, J. L., Ellstrand, A. E., & Romi, A. M. (2013). Beyond "does it pay to be green?" A meta-analysis of moderators of the CEP–CFP relationship. *Journal of Business Ethics, 112*(2), 353-366.

Farag, H., Meng, Q., & Mallin, C. (2015). The social, environmental and ethical performance of Chinese companies: Evidence from the Shanghai Stock Exchange. *International Review of Financial Analysis, 42*, 53-63.

Griffin, P. A., Lont, D. H., & Sun, E. Y. (2017). The relevance to investors of greenhouse gas emission disclosures. *Contemporary Accounting Research, 34*(2), 1265–1297. https://doi.org/10.1111/1911-3846.12298

Hahn, R., Reimsbach, D., & Schiemann, F. (2015). Organizations, climate change, and transparency: Reviewing the literature on carbon disclosure. *Organization & Environment, 28*(1), 80-102.

Haque, F., & Ntim, C. G. (2020).Executive compensation, sustainable compensation policy, carbon performance and market value. *British Journal of Management, 31*(3), 525–546. https://doi.org/10.1111/1467-8551.12395

Hassan, O. A., & Romilly, P. (2018). Relations between corporate economic performance, environmental disclosure and greenhouse gas emissions: New insights. *Business Strategy and the Environment, 27*(7), 893-909.

He, Y., Tang, Q., & Wang, K. (2013).Carbon disclosure, carbon performance, and cost of capital. *China Journal of Accounting Studies, 1*(3-4), 190-220.

Heede, R. (2014). Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010.*Climate Change, 122*(1-2), 229-241.

Helfaya, A., Whittington, M., & Alawattage, C. (2019).Exploring the quality of corporate environmental reporting. *Accounting, Auditing & Accountability Journal, 32(1),* 163-193.

Hummel, K., & Schlick, C. (2016).The relationship between sustainability performance and sustainability disclosure–Reconciling voluntary disclosure theory and legitimacy theory. *Journal of Accounting and Public Policy, 35*(5), 455-476.

IEA. (2021). Global Energy Review: CO2 Emissions in 2020; IEA: Paris, France, 2021; Available online: https://www.iea.org/articles/globalenergy-review-co2-emissions-in-2020

Jo, H., & Harjoto, M. (2014). Analyst coverage, corporate social responsibility, and firm risk. *Business Ethics: A European Review, 23*(3), 272-292.

Lartey, T., Yirenkyi, D. O., Adomako, S., Danso, A., Amankwah-Amoah, J., & Alam, A. (2020). Going green, going clean: Lean-green sustainability strategy and firm growth. *Business Strategy and the Environment, 29*(1), 118-139.

Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences, 45*(2), 123-152.

Li, D., Huang, M., Ren, S., Chen, X., & Ning, L. (2018). Environmental legitimacy, green innovation, and corporate carbon disclosure: Evidence from CDP China 100. *Journal of Business Ethics, 150*(4), 1089-1104.

Lin, W. L., Law, S. H., Ho, J. A., & Sambasivan, M. (2019). The causality direction of the corporate social responsibility–corporate financial performance nexus: Application of panel vector autoregression approach. *The North American Journal of Economics and Finance, 48*, 401-418.

Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe.*Accounting, Auditing & Accountability Journal*, *28*(7), 1047–1074. https://doi.org/ 10.1108/AAAJ-12-2013-1547

Luo, L. (2019). The influence of institutional contexts on the relationship between voluntary carbon disclosure and carbon emission performance. *Accounting & Finance, 59*(2), 1235-1264.

Matsumura, E. M., Prakash, R., & Vera-Muñoz, S. C. (2013). Firm-value effects of carbon emissions and carbon disclosures. *The Accounting Review*, *89*(2), 695-724.

McKinsey & Company. (2020). *Climate risk and response: Physical hazards and socioeconomic impacts*. Available at: https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-response-physical-hazards-and-socioeconomic-impacts

Meng, X., Zeng, S., Shi, J. J., Qi, G., & Zhang, Z. (2014). The relationship between corporate environmental performance and environmental disclosure: An empirical study in China. *Journal of Environmental Management, 145*, 357-367.

Nnubia, I. C. & Omaliko, E. (2016).The role of accounting in supporting adaptation to climate change in Nigeria. . De academia international journal of science and contemporary studies, 2(1), 155-161.

Okafor, O. O., Agbata, A. E., Nnubia, I. C. & Okaro, S. C. (2023). Corporate social responsibility and the impact of COVID-19 on Healthcare institutions in Nigeria. In: Idowu, S. O., Idowu, M.T., Idowu, A.O. (eds) corporate social responsibility in the Health sector. CSR, Sustainability, Ethics & Governance. Springer, Cham. https://doi.org/10.1007/978-3-031-23261-9_12

Parlette, N. (2019). Going green – What's good for the planet is good for business. *Forbes*. Available at: https://www.forbes.com/sites/natalieparletta/2019/05/14/going-green-whats-good-for-the-planet-is-good-for-business/#69e012713201

Sadorsky, P. (2014). The effect of urbanization on CO2 emissions in emerging economies. Energy Econ., 41, 147–153.

Shen, F., Ma, Y., Wang, R. (2019). Does environmental performance affect financial performance? Evidence from Chinese listed companies in heavily polluting industries. *Quality and Quantity*, 53, 1941–1958.

Tang, S., & Demeritt, D. (2018). Climate change and mandatory carbon reporting: Impacts on business process and performance. *Business Strategy and the Environment*, *27*(4), 437-455.

Uyar, A., Karaman, A. S., & Kilic, M. (2020). Is corporate social responsibility reporting a tool of signaling or greenwashing? Evidence from the worldwide logistics sector. *Journal of Cleaner Production*, *253*, 119997.

Velte, P., Stawinoga, M., &Lueg, R. (2020). Carbon performance and disclosure: A systematic review of governance-related determinants and financial consequences. *Journal of Cleaner Production*, *253*, 120063.

Wang, F., Sun, J., & Liu, Y. S. (2019). Institutional pressure, ultimate ownership, and corporate carbon reduction engagement: Evidence from China. *Journal of Business Research, 104*, 14–26. https://doi.org/10.1016/j.jbusres.2019.07.003

Wen, F.;Wu, N.; and Gong, X. (2020). China's carbon emissions trading and stock returns. *Energy Econ.*, 86, 104627.

Wijen, F. (2014). Means versus ends in opaque institutional fields: Trading off compliance and achievement in sustainability standard adoption. *Academy of Management Review, 39*(3), 302-323.

Xie, J., Nozawa, W., Yagi, M., Fujii, H., & Managi, S. (2019). Do environmental, social, and governance activities improve corporate financial performance? *Business Strategy and the Environment, 28*(2), 286-300.

Xu, H., Huang, S., Lucey, B. M., and An, H. (2023). The impacts of climate policy uncertainty on stock markets: Comparisons between China and the US. *International Review of Financial Analysis, 88*. https://doi.org/10.1016/j.irfa.2023.102671