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THE EFFECT OF FIRM ATTRIBUTES ON ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) DISCLOSURE QUALITY OF LISTED OIL AND GAS COMPANIES IN NIGERIA

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ABSTRACT
This study examines the effect of firm attributes on the Environmental, Social, and Governance (ESG) disclosure quality of listed oil and gas companies in Nigeria. Using correlative research design and secondary data drawn from annual and sustainability reports, the study employed Robust Ordinary Least Squares (OLS) regression on a strongly balanced panel of 49 firm-year observations. ESG disclosure quality was measured using a self-constructed 45-item index based on the Global Reporting Initiative (GRI) Standards. The results reveal that firm size and profitability have positive and statistically significant effects on ESG disclosure quality, while leverage and firm age are not statistically significant. The findings support agency theory, stakeholder theory, and legitimacy theory, indicating that larger and more profitable firms disclose more comprehensively due to greater visibility, resource capacity, and the need to maintain social legitimacy. The study recommends that larger and more profitable oil and gas companies continue to strengthen their ESG reporting systems, while regulators should design capacity-sensitive disclosure frameworks that recognize differences in firm scale and financial strength.

Keywords: *ESG disclosure quality; firm size; profitability; leverage; firm age; oil and gas companies; Nigeria*

1. INTRODUCTION

The increasing integration of environmental, social, and governance (ESG) considerations into corporate reporting has reshaped the global understanding of what it means for a company to perform well. Beyond financial profit, stakeholders now demand that organisations account for their impact on the environment, their relationship with society, and the integrity of their governance structures. ESG disclosure quality — the comprehensiveness and transparency with which companies report on these dimensions — has therefore emerged as a critical measure of corporate accountability in modern business environments. In Nigeria, this necessity is particularly pronounced within the oil and gas sector, where decades of environmental degradation, community conflict, and governance failures in the Niger Delta region have heightened demands for more transparent and responsible corporate reporting.

Corporate sustainability reporting has evolved significantly over the past three decades, transitioning from a peripheral public relations activity to a mainstream governance obligation. The Global Reporting Initiative (GRI), established in 1997, pioneered the development of standardised frameworks for ESG disclosure, enabling comparability and accountability across industries and geographies (GRI, 2021). In Nigeria, awareness of ESG reporting has grown alongside regulatory reform, with the Securities and Exchange Commission (SEC) issuing sustainability disclosure guidelines in 2021 and the Nigerian Exchange Group (NGX) releasing its ESG Disclosure Guidelines in 2022. These developments signal a decisive shift toward formalising sustainability reporting as a corporate obligation rather than a voluntary gesture.

The oil and gas sector occupies a unique position in Nigeria's economic and environmental landscape. Contributing approximately 80% of government revenues and over 90% of foreign exchange earnings (NNPCL, 2023), the sector is simultaneously the engine of national development and the source of its most severe environmental and social challenges. Despite this, the quality of ESG reporting among Nigerian oil and gas companies remains poorly understood, with most firms providing

fragmented, selective, and largely unverifiable disclosures. Existing Nigerian ESG research is disproportionately concentrated in the banking and financial services sector, leaving the oil and gas sector — arguably the country's most sustainability-sensitive industry — largely unexamined. Moreover, the few oil and gas studies that exist tend to focus narrowly on environmental or pollution disclosure rather than the full ESG spectrum, and employ simplistic measurement approaches that fail to capture the depth and quality of corporate disclosures (Adeyemi & Fagbemi, 2010).

This study is therefore motivated by the need to examine what drives ESG disclosure quality in Nigerian oil and gas companies, particularly during the current regulatory transition period ushered in by the SEC (2021) and NGX (2022) guidelines. Specifically, the study examines the effect of four firm attributes — firm size, profitability, leverage, and firm age — on the ESG disclosure quality of the seven companies listed on the NGX under the oil and gas sector: Seplat Energy Plc, Oando Plc, TotalEnergies Marketing Nigeria Plc, Ardova Plc, Conoil Plc, MRS Oil Nigeria Plc, and Aradel Holdings Plc, over the period 2018 to 2024. On this basis, the following hypotheses are tested in null form:

H_{01}: Firm size has no significant effect on the ESG disclosure quality of listed oil and gas companies in Nigeria.

H_{02}: Profitability has no significant effect on the ESG disclosure quality of listed oil and gas companies in Nigeria.

H_{03}: Leverage has no significant effect on the ESG disclosure quality of listed oil and gas companies in Nigeria.

H_{04}: Firm age has no significant effect on the ESG disclosure quality of listed oil and gas companies in Nigeria.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

ESG disclosure refers to the process by which companies communicate information about their environmental impact, social responsibilities, and governance practices to a broad range of stakeholders, including investors, regulators, employees, host communities, and the general public (GRI, 2021). ESG disclosure quality, as distinct from mere disclosure, refers to the depth, comprehensiveness, accuracy, and verifiability of the information disclosed. A company may technically produce a sustainability report but disclose very little of substance, a practice sometimes described in the literature as greenwashing (Boiral, 2013). Quality disclosure, by contrast, goes beyond symbolic reporting to provide stakeholders with decision-useful, credible, and complete information across all three ESG dimensions, ranging from minimal token disclosures at one end to comprehensive, GRI-aligned reports at the other (Alsaifi, Elnahass & Salama, 2020).

Firm attributes refer to the inherent structural, financial, and operational characteristics that define the nature and scale of a company's operations, and have long been recognised in the disclosure literature as key determinants of the extent and quality of information that companies provide to their stakeholders (Jensen & Meckling, 1976; Watts & Zimmerman, 1978). This study focuses on four such attributes. Firm size, typically proxied by the natural logarithm of total assets, captures the scale of a company's operations and its associated public visibility; larger firms face greater scrutiny and possess more resources for comprehensive reporting, and empirical evidence largely supports a positive relationship between firm size and ESG disclosure quality (Giannarakis, 2014; Alsaifi et al., 2020; Amahalu, Okoye & Obi, 2022). Profitability, commonly measured by Return on Assets, reflects the financial capacity and incentive of a firm to invest in sustainability communication; the relationship is grounded in both the resource-based view and stakeholder theory (Freeman, 1984), although some studies report a negative or insignificant relationship, suggesting the association is not straightforwardly linear (Abubakar, 2021). Leverage, measured as the ratio of total liabilities to total assets, is theorised through agency theory to increase disclosure as highly indebted firms seek to reassure creditors (Jensen & Meckling, 1976), though empirical evidence is mixed, with some studies finding a positive association (Luo, Lan & Tang, 2013) and others finding none (Amahalu et al., 2022; Bouten, Everaert & Roberts, 2011). Firm age, measured as years since incorporation, proxies institutional maturity; while older firms are theorised to have accumulated legitimacy and more robust reporting systems (Bouten et al., 2011), others argue that older firms may become complacent while newer firms disclose assertively to build credibility, making the relationship theoretically ambiguous.

Comparable empirical studies reinforce these theoretical expectations. Amahalu et al. (2022) found that firm size and profitability had significant positive effects on sustainability reporting quality among Nigerian consumer goods firms, while leverage showed a negative but insignificant relationship. Alsaifi et al. (2020) found firm size to be the most consistent predictor of carbon disclosure quality among UK firms. Luo et al. (2013), examining Chinese listed oil companies, found significant relationships between firm size, leverage, and environmental disclosure quality, offering a useful comparative benchmark for the present study's focus on the oil and gas sector. Abubakar (2021) found that larger and more profitable Nigerian firms provided more extensive environmental disclosures, though the study's scope was limited to environmental disclosure rather than the full ESG spectrum, a gap the present study addresses.

The study is underpinned by three complementary theories. Agency theory (Jensen & Meckling, 1976) explains that the separation of ownership and control creates information asymmetry between managers (agents) and shareholders (principals), and that larger and more leveraged firms, facing more complex agency relationships and creditor monitoring, are expected to disclose more to reduce this asymmetry. Stakeholder theory (Freeman, 1984) posits that firms with greater societal exposure — often the larger, more profitable, or more indebted ones — face stronger pressure to legitimise their operations through transparent reporting to a broad set of stakeholders beyond shareholders alone. Legitimacy theory complements both perspectives by suggesting that firms disclose ESG information to maintain a perceived congruence between their operations and societal expectations, particularly important for oil and gas companies operating in the environmentally sensitive Niger Delta region. Taken together, these theories provide a robust conceptual basis for expecting firm size, profitability, leverage, and firm age to shape ESG disclosure quality among Nigerian oil and gas companies.

3. METHODS AND TECHNIQUES

This study adopts a correlative research design, appropriate because the variables of interest — firm size, profitability, leverage, firm age, and ESG disclosure quality — already exist in the form of published annual and sustainability reports. A panel data design is further adopted, combining cross-sectional data (seven companies) with time-series data (seven years: 2018–2024). The population comprises all seven companies listed on the Nigerian Exchange Group (NGX) under the oil and gas sector classification: Seplat Energy Plc, Oando Plc, TotalEnergies Marketing Nigeria Plc, Ardova Plc, Conoil Plc, MRS Oil Nigeria Plc, and Aradel Holdings Plc. Given the small and finite population, a census approach is adopted, and the study relies exclusively on secondary data obtained from company annual reports, the NGX filings portal, and the SEC Nigeria filing database.

ESG disclosure quality (ESGDQ), the dependent variable, is measured using a self-constructed unweighted disclosure index grounded in the GRI Standards, comprising 45 items across three sub-dimensions: 15 Environmental items, 15 Social items, and 15 Governance items. Each item is scored 1 if disclosed and 0 if not, and the overall score is computed as the number of items disclosed divided by the total applicable items. As the index was self-constructed and unweighted, no formal inter-rater reliability check or independent expert review procedure was applied to the disclosure scoring; this represents a limitation of the study, and future research should incorporate independent coding and cross-checking to strengthen the reliability of the disclosure index. Firm size (FSIZE) is measured as the natural logarithm of total assets; profitability (PROF) as Return on Assets (profit after tax divided by total assets); leverage (LEV) as the ratio of total liabilities to total assets; and firm age (FAGE) as the number of years from incorporation to the year of observation. The panel data regression model is specified as:

$$ESGDQit = \beta0 + \beta1FSIZEit + \beta2PROFit + \beta3LEVit + \beta4FAGEit + \varepsilon it$$

Where ESGDQ is ESG disclosure quality, FSIZE is firm size, PROF is profitability, LEV is leverage, FAGE is firm age, $\beta0$ is the constant, $\beta1$–$\beta4$ are the coefficients of the independent variables, and ε is the error term, for firm i in year t. The a priori expectation is that all four coefficients are positive ($\beta1, \beta2, \beta3, \beta4 > 0$), consistent with agency theory, stakeholder theory, and legitimacy theory.

Model selection followed a two-stage procedure. The Breusch-Pagan Lagrange Multiplier (LM) test was first conducted to determine whether pooled OLS or the random effects estimator was more appropriate for the data, and the Hausman specification test was subsequently conducted to

discriminate between the fixed effects and random effects estimators. Given the panel's limited cross-sectional dimension (seven firms observed over seven years) and the outcome of these diagnostic procedures, pooled Robust Ordinary Least Squares (OLS) regression was adopted as the most appropriate and sufficient estimator for the final analysis: it provided efficient estimates given the limited cross-sectional variation, while robust standard errors corrected for the heteroskedasticity subsequently detected in the data. Diagnostic tests — the Variance Inflation Factor (VIF) test for multicollinearity and the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity — were also conducted, with all analyses performed using Stata statistical software.

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the 49 firm-year observations. ESG Disclosure Quality (ESGDQ) has a mean value of 0.6327, indicating that, on average, the sampled companies disclosed approximately 63.27% of the 45 GRI-based checklist items over the study period. The standard deviation of 0.2416 and the range between 0.00 and 0.98 point to considerable variability, likely reflecting the transition from the earlier voluntary, pre-regulatory disclosure environment to the period following the SEC (2021) and NGX (2022) guidelines. Profitability (PROF) has a mean of 0.0306, reflecting generally modest returns given the cost pressures and foreign exchange volatility that characterise the sector, while Firm Size (FSIZE), measured as the log of total assets, has a mean of 26.1016. Firm Age (FAGE) shows a mean of 48.6327 years, spanning both long-established and relatively young firms, and Leverage (LEV) has a mean of 0.6659, consistent with the capital-intensive, debt-reliant nature of the oil and gas sector.

Table 1: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ESGDQ	49	0.6327	0.2417	0	0.98
PROF	49	0.0306	0.0536	-0.1012	0.1873
FSIZE	49	26.1016	1.6189	21.71	29.92
FAGE	49	48.6327	19.3064	9	68
LEV	49	0.6659	0.2588	0.2	1.16

4.2 Correlation Analysis

The Pearson correlation matrix in Table 2 shows that Firm Size has a moderate positive correlation with ESGDQ (0.5447), and Profitability also correlates positively with ESGDQ (0.3962), both consistent with a priori expectations. Firm Age shows a moderate negative correlation with ESGDQ (-0.4574), and Leverage similarly shows a negative correlation (-0.3018), both contrary to expectation at the bivariate level. Among the explanatory variables, the strongest pairwise association is between Firm Age and Leverage (0.7058), which, while notable, remains below the conventional 0.80 threshold for concern (Gujarati, 2004), suggesting multicollinearity is unlikely to be a serious problem — a conclusion formally verified through the VIF test. The sign reversal of leverage between the bivariate and multivariate results — negative in the correlation matrix but positive, albeit insignificant, in the regression reported in Table 3 — is attributable to its strong positive correlation with firm age. At the bivariate level, leverage's association with ESGDQ appears to absorb the negative influence of firm age; once firm age is held constant in the multivariate regression, the underlying positive association between leverage and ESGDQ, consistent with agency theory's creditor-monitoring hypothesis, becomes apparent.

Table 2: Correlation Matrix

Variables	ESGDQ	PROF	FSIZE	FAGE	LEV
ESGDQ	1.0000				
PROF	0.3962	1.0000			
FSIZE	0.5447	0.0321	1.0000		
FAGE	-0.4574	-0.2278	-0.5152	1.0000	
LEV	-0.3018	-0.5195	-0.2149	0.7058	1.0000

4.3 Regression Results

Table 3 presents the Robust OLS regression results. The R-squared value of 0.4712 indicates that the four firm attributes jointly explain approximately 47.12% of the variation in ESG disclosure quality among the sampled companies, and the F-statistic of 9.80 (p = 0.0000) confirms that the model, taken as a whole, is statistically significant at the 1% level.

Variables	Coefficient	Std. Error	t-value	p-value
PROF	1.9425	0.5945	3.27	0.002
FSIZE	0.0635	0.0197	3.22	0.002
FAGE	-0.0037	0.0023	-1.6	0.117
LEV	0.2089	0.1736	1.2	0.235
Constant	-1.0425	0.5546	-1.88	0.067

$R^2 = 0.4712$ Adj. $R^2 = 0.4232$ $F(4,44) = 9.80$ Prob > F = 0.0000 Root MSE = 0.1835

Table 3: Regression Results (Dependent Variable: ESGDQ)

Profitability (PROF) has a coefficient of 1.9425 and is statistically significant at the 1% level (p = 0.002), indicating that, holding other factors constant, an increase in a firm's Return on Assets is associated with a corresponding increase in its ESG disclosure quality score. This supports the view that more profitable oil and gas companies possess the financial surplus needed to invest in sustainability reporting infrastructure and face greater stakeholder pressure to demonstrate that financial success is matched by responsible conduct. The finding leads to the rejection of H_{02} and is consistent with Amahalu et al. (2022) and Abubakar (2021).

Firm Size (FSIZE) has a coefficient of 0.0635 and is also significant at the 1% level (p = 0.002), indicating that larger firms disclose ESG information more comprehensively than smaller firms. This is consistent with agency theory's prediction that larger firms, facing more complex agency relationships and greater scrutiny, disclose more to reduce information asymmetry, and confirms firm size as one of the most consistent predictors of disclosure quality in the literature (Alsaifi et al., 2020; Amahalu et al., 2022; Pizzi, Caputo, Corvino & Venturelli, 2021). This finding leads to the rejection of H_{01}.

Firm Age (FAGE) has a coefficient of -0.0037 and is not statistically significant (p = 0.117), while Leverage (LEV) has a coefficient of 0.2089, positive as expected but also not statistically significant (p = 0.235). The null hypotheses H_{03} and H_{04} therefore fail to be rejected. The insignificant effect of leverage suggests that creditor monitoring in Nigeria's oil and gas sector is not yet institutionalised enough to systematically translate indebtedness into stronger disclosure incentives (Amahalu et al., 2022; Bouten et al., 2011), while the insignificant, negative effect of firm age suggests that older, more established firms may rely on accumulated reputational capital and settled reporting routines rather than continuously improving disclosure quality, whereas younger firms may disclose more assertively to build market credibility. The constant term of -1.0425 is only marginally significant (p = 0.067) and is not substantively interpreted; it represents the predicted ESGDQ score when all explanatory variables are held at zero, a hypothetical condition that does not correspond to any firm in the sample, and its main function here is to anchor the regression line rather than to convey a meaningful baseline disclosure level.

It is also important to acknowledge a key limitation of the analysis. The dataset comprises only seven cross-sectional units (firms) observed over seven years, yielding 49 firm-year observations. This limited cross-sectional variation constrains the statistical power of the estimates, increases the sensitivity of the results to individual firm behaviour, and limits the extent to which the findings can be generalised beyond the population of NGX-listed oil and gas companies. The results should therefore be interpreted as indicative of patterns within this specific population and period rather than as broadly generalisable estimates.

Diagnostic tests confirm the reliability of the model. The Variance Inflation Factor test produced a mean VIF of 2.16, with individual values ranging from 1.45 to 2.88, well below the conventional threshold of 10, confirming the absence of serious multicollinearity. The Breusch-Pagan/Cook-Weisberg test produced a chi-square value of 5.10 (p = 0.0240), indicating the presence of heteroskedasticity; this is addressed through the use of robust standard errors in the final estimation, and does not affect the unbiasedness of the coefficient estimates.

Overall, the findings affirm the relevance of agency theory and stakeholder theory in explaining ESG disclosure behaviour among Nigerian oil and gas companies, particularly through the channels of

firm size and profitability, while offering more limited support for the role of leverage and firm age within this specific sample and period.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the effect of firm attributes — firm size, profitability, leverage, and firm age — on the ESG disclosure quality of listed oil and gas companies in Nigeria, using a panel of 49 firm-year observations from the seven NGX-listed oil and gas companies over the period 2018 to 2024. The results show that firm size and profitability are significant positive determinants of ESG disclosure quality, while leverage and firm age are not statistically significant, though leverage retains the expected positive sign. The four firm attributes jointly explain approximately 47% of the variation in ESG disclosure quality, and the model is jointly significant at the 1% level. These findings are consistent with agency theory, legitimacy theory and stakeholder theory, and confirm that larger and more profitable oil and gas companies in Nigeria disclose ESG information more comprehensively.

Profitability in essence is that more profitable oil and gas companies in Nigeria disclose ESG information more comprehensively because they have both the financial capacity and the incentive to do so. Profitable firms have the financial surplus to invest in the sustainability reporting infrastructure — staff, systems, and processes — needed to produce comprehensive GRI-aligned reports. At the same time, they face greater stakeholder pressure to demonstrate that their financial success is matched by responsible environmental, social, and governance conduct, which is consistent with both the resource-based view and stakeholder theory. This finding aligns with prior studies such as Amahalu et al. (2022) and Abubakar (2021), reinforcing that profitability is a consistent driver of disclosure quality in the Nigerian context.

The study recommends that regulators, including the Securities and Exchange Commission and the Nigerian Exchange Group, strengthen ESG disclosure requirements for listed oil and gas companies and consider capacity-sensitive guidelines that recognise differences in firm size and profitability. Policymakers should support the development of a clearer national ESG reporting framework for the sector to reduce fragmented and voluntary disclosure practices. Larger and more profitable companies should continue to strengthen and formalise their ESG reporting systems, and investors and creditors should incorporate ESG disclosure quality into their investment analysis, risk assessment, and lending decisions as a signal of responsible management. Future research should examine additional determinants such as ownership structure and the presence of a dedicated sustainability committee, extend the analysis to other environmentally sensitive Nigerian sectors, and refine ESG disclosure measurement through weighted indices that capture disclosure depth rather than mere presence. Given that these findings are based on a small, sector-specific sample of seven firms, the recommendations above should be applied and interpreted cautiously and are not necessarily generalisable to other sectors or to the broader population of Nigerian firms.

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