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FINANCIAL PERFORMANCE AND ENVIRONMENTAL SUSTAINABILITY REPORTING OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

Environmental sustainability reporting (ESR) has become increasingly important for identifying environmentally responsible firms and balancing profit objectives with sustainability expectations. This study examined how financial performance influences ESR among listed manufacturing firms in Nigeria, focusing on profitability and liquidity as key determinants. An ex-post facto research design was adopted, relying on secondary data extracted from the annual reports and accounts of sampled firms over the period 2015–2024. Using proportional sampling, 23 firms were selected from 67 listed manufacturing firms. The data were analysed using regression techniques at the 5% level of significance. The findings reveal that profit after tax (PAT) has a positive and statistically significant effect on ESR. In contrast, earnings per share (EPS) and liquidity ratio show positive but statistically insignificant relationships with ESR. Therefore, the study recommends that Since profitability (PAT) significantly improves ESR, firms should allocate a defined portion of annual profits toward environmental compliance, pollution control, waste management, and sustainability initiatives, and ensure these activities are transparently disclosed in annual reports.

Keywords: strategic environmental sustainability reporting, earnings per share, liquidity, profit after tax, listed manufacturing firms

1. Introduction

Globally, shareholders' wealth maximization is no longer seen as the overall objective of a company operating in the 21st century (Adeyanju, 2012). Nowadays, businesses are been accorded social responsibilities by the society and this has made business environment more competitive. An important part of corporate social responsibility being integrated into business concept is the environmental element, which will definitely attract cost if companies obliged. The universal awareness of stakeholders regarding environmental impact of companies' economic activities has posed a threat to evaluation of companies' performances through their traditional financial reports (Malik & Mittal, 2015). This is why environmental practices have been perceived as the opportunity cost of growth and financial performance for firms (Nwaiwu & Oluka, 2018).

In Nigeria, the unguided quest for economic development through oil exploration and lack of appropriate policies to guide the economic activities of companies has birthed conflict between the legal entity and its concerned stakeholders. These shortcomings have made firms to lose stakeholders' trust of the view that management represent and protect the interest of the society. Hence, companies will likely engage in environmental reporting to prove their commitment to environmental responsibilities; conformity with speculated environmental laws and, guidelines and exhibition of environmental concerns to a wide range of concerned stakeholders (Ofoegbu & Megbuluba, 2016; Beredugo & Mefor, 2012). However, beyond regulatory compliance, environmentally sustainable practices must be ethically desirable for every environmentally responsible firm (Okoye & Asika, 2013).

Howbeit, the financial resources needed to engage in environmental accounting maybe a hindrance for many firms. This is because the design of environmental protection strategy and its implementation may cost a fortune and in turn increase firms' cost of product which may affect its financial performance (Ebieri, 2018). Theorists like Friedman, John Dewey and Clarence Ayres have argued that it is not at the best interest of shareholders that a firm spends resources beyond compliance.

According to the classical view of companies' performance, firms only need to use the resources at their disposal efficiently in order to meet the demand of the society by providing just the needed goods and services (Daferighe, Akpanuko & Offiong, 2019). Quite a good number of previous studies have investigated the motivation for disclosure of environmental information by companies (Olaleye & Igbekoyi, 2020; Bednárová, Klimko, & Rievajová, 2019; Ali & Hafez, 2014). Overall examination of the findings of these studies showed that there exist significant association between environmental reporting and regulatory requirements; expectations of stakeholders and society pressures; reputations and economic factors.

Also, large portions of previous research have debated the relationship between corporate profitability and firms' environmental accounting practices but there has been mixed result. Some are of the opinion that there is a positive relationship between firm profitability and environmental accounting practices (Yahaya, 2018; Peter & Mbu-Ogar, 2018; Achoki, Kule & Shukula, 2016) while some studies have found negative relationship (Nwaiwu & Oluka, 2018; Kamal, 2016; Odia & Imagbe, 2015; Magali, Nicholas & Jinghui, 2015; Makori & Jangogo, 2013; Bassey, Sunday & Okon, 2013; Suttipun & Stanton, 2012; Echave & Bhati, 2010).

The disparity in opinion and findings of these studies may be tied to different perception of company's stakeholders on the social and economic consequence of environmental reporting practices and as well the scope of coverage by these studies. Due to the indecisive nature of results from previous studies, the study aimed at investigating how firms' financial performance affects environmental sustainability responsibility through reporting. The study specific objectives are:

i. To examine the effect of profit after tax on ESR of listed manufacturing firms.
ii. To investigate the effect of earnings per share on ESR of listed manufacturing firms.
iii. To evaluate the effect of liquidity on ESR of listed manufacturing firms.

In line with specific objectives, the following hypotheses were formulated and stated in null form:

H_{01}: Profit After Tax does not have a significant impact on ESR of listed manufacturing firms in Nigeria.
H_{02}: Earnings per share does not have a significant impact on ESR of listed manufacturing firms in Nigeria.
H_{03}: Liquidity does not have a significant impact on ESR of listed manufacturing firms in Nigeria.

In this study, manufacturing firms were made the focus because it is a highly environmentally sensitive industry and moreover, they are being exposed to greater societal pressure due to noticeable ecological distress created by their production activities. The study is discussed under five sections which are; Introduction, literature and theoretical review, data and methods, results and discussion, conclusion and recommendations.

2. Literature Review

Basically, the concept of environmental sustainability reporting means communication of an organization's environmental performance. Ayşenur (2016) describes environmental sustainability reporting as the communication of an organization's ability to maintain the productivity and green condition of the environment while carrying out its activities with the aim to proffer solution to existing environmental problems; improve environmental performance and show respect for environmental concern of stakeholders.

Krivačić and Janković (2017) refer to environmental reporting as the logical and holistic statements of environmental efforts of an organization through its activities such as environmental policies, objectives, programs and their outcomes. It is a means of releasing information that assist external users of company's report to assess the efficiency of organizations in their use of available natural and economic resources and the degree at which they perform their environmental responsibilities (Ali & Hafez, 2014).

It is essential for companies to render their stewardship to environmentally concerned stakeholders about the companies' interface with natural environment (Ebieri,2018). According to Igbekoyi et al. (2021), environmental sustainability reporting is an assessment tool for environmental apologist and firms' indication of their accountability regarding environmental issues. Actually, the expectations of social responsibility from companies have necessitated the need for them to report their social and environmental dealings to significant stakeholders (Moses et al., 2014).

According to Malik and Mittal (2015), there are expected factors that needed to be assessed and disclosed thereof while giving environmental sustainability report. They include; environmental policy, strategy for energy conservation, implemented environmental initiatives, waste management practices, water management, workplace health and safety, environmental liabilities and environmental assets.

In recent times, there has been an increasing expectation from different stakeholders (government, investors, lenders, banks, employees, non-governmental organizations etc.) to have financial data on the environmental performance of different organizations (Igbodo et al., 2018). For firms to meet the environmental needs of stakeholders and as well realize the financial and economic values attached to environmental responsibilities, they usually make effort to ensure that relevant stakeholders are able to understand, recognize and assess their environmental commitment (Moratis, 2018). This is majorly been achieved through environmental reporting.

Financial performance literarily denotes the level of efficiency and effectiveness of an entity in managing its economic resources to achieve desired returns. It also denotes the degree of a firm's financial wellbeing over a period of time (Naz, Ijaz & Najvi, 2016). In a clearer term, the financial wellbeing of a company depicts the competence of a company to generate profit from its production and investment activities and as well meet its financial obligations.

In accounting, financial evaluation is done by examining firm's financial performance which is measured by: profitability of companies in terms of return on assets, profit after tax, returns on equity, earnings per share and lots more; liquidity of firms in terms of current ratio, quick ratio, cash asset ratio; market value of shares; firm growth in terms total assets and returns on capital employed (Ahmad, Simon & Mohammed, 2017).

The two dominants' indicators considered by primary stakeholders like management, creditors, shareholders and customers are profitability and liquidity capability of firms because they give details of their information needs. In this light, the study will evaluate financial performance of sampled firms by considering their profitability and liquidity status. Two measurements (Profit after Tax and Earnings per Share) were considered for profitability while liquidity ratio was used to capture firm's liquidity.

The profitability of an organization on the one hand connotes their earning power or operating performance. It shows how efficiently the management can make profit by using all the resources at its disposal in the available market (Pallavi, 2018). According to Karambu and Joseph (2016), profitability is the earnings or profits made by firm in order to survive and grow over a period of time. After studying the nature of relationship that exist between environmental reporting and oil companies' performance in Nigeria by considering 11 quoted oil companies selected through simple random sampling technique, Umoren et al. (2018) found insignificant relationships between environmental reporting and performance variables, that is, return on capital employed, net profit margin, earnings per share and dividend per share. The major limitation of the study is that the measurements concentrate and captures only shareholders expectation on investment.

Liquidity on the other hand depicts firm's ability to pay all short-term financial liabilities at maturity using the available current assets (Nasution et al., 2018). Liquidity ratio indicates the easiness at which a corporate entity can meet both its expected and unexpected obligations at a reasonable cost (Olatunde, 2015). It further describes the ability of a firm to finance a desired increase in its asset without incurring damaging losses that can lead to its insolvency. The higher the liquidity ratio, the better it is for companies. This is because the companies are exposed to lower risk of failure. Conversely, this means a liquid firm has the ability to carry out environmental responsibility by which they could send out signal that the firm is doing well because a company with strong financial condition tends to reveal more information.

Several empirical studies have been carried out to analyze the relationship between environmental sustainability practice and financial performance of Nigerian firms. Egbunike and Okoro (2018) investigated whether green accounting matters to the profitability of Nigerian firms or not. Towards achieving this, an expo-facto research design was adopted and 10 non-consumer goods firms listed on the Nigerian Stock Exchange were selected over the period of 2012-2016. The study revealed that there was

no significant relationship between green accounting and profitability measures among the non-consumer goods firms.

In the same vein, Abdullah (2018) examined the effect of social and environmental accounting on companies' profit. The objective of the study is to find out if there is a relationship between environmental accounting and profitability and to know whether the firms actually care about any social or environmental practice or it's been neglected. The study employed survey research design, and sourced the qualitative data from distributed questionnaire to 50 local and international firms located in Erbil. The outcomes of the study showed that there exists a critical relationship between environmental accounting and company's benefit.

Ahmad et al. (2017) in their findings indicate that larger companies disclosed more environmental information because firm size influence the extent of environmental disclosure. Return on Asset (ROA), Return on Equity (ROE), and Earnings per Share (EPS) were used as proxies for measuring performance. The empirical result indicates that quantitative environmental disclosure has a positive but insignificant effect on ROA and EPS respectively. While examining the relevance of environmental accounting practices to sustainable development and performance of listed manufacturing companies in Nigeria,

Osemene et al. (2016) found a significant positive relationship between environmental accounting and returns on equity (ROE) of thirty-six quoted companies randomly selected in Nigeria. Also, Huey Shi Tho and Boon Heng The (2016) examined the relationship between environmental disclosure and financial performance of public listed companies in Malaysia. Content analysis approach was adopted to determine the quantity and quality of environmental disclosures in the annual reports of 100 companies listed on the Main board of Bursa Sarhan Malaysia for the year 2009 until 2013. The result showed that only the quality of the environmental information has positive relationship with companies' earnings per share (EPS).

Theoretical Review

One of the most influential theories that discuss organizational and strategic management is the Freeman's stakeholder theory (1983). It explains better the relationship that is expected between a firm and its stakeholders that are capable of influencing its decision. This is important because focusing exclusively on the need of the shareholders expose firms to complicated conflict of interest that can affect the firms' resources and reputation (Iheduru & Chukwuma, 2019).

Stakeholders' theory proposed an improved level of corporate planning which includes the non-traditional stakeholders like customers, local community and regulatory groups in order to adapt to changing social demands. Since accountability towards the range of stakeholders in business is the message of stakeholders' theory and perhaps the standard that is expected to meet societal expectations, companies will have difficulty in accomplishing environmental goals if the resources are not available or if it will result in monetary losses for the shareholders since they still remain the financial sponsors of the company.

In this era of sustainable developments, the expectations of stakeholders like shareholders and creditors who are the main financial sponsors of the company is that companies should manage resources properly in an environmentally friendly way that will result in direct returns such as cost savings and indirect returns such as better goodwill and image for the organization (Igbodo et al., 2018). This shows that shareholders do pay

attention to economic consequences of environmental behaviour of their company because of the direct or indirect impacts it will have on the returns of their investment (Eze et al., 2016).

In the study of Ebieri (2018), it was revealed that sustainability costs have significant effect on the net worth of 20 listed firms on Nigeria Stock Exchange after examining the effect of sustainability costs on net-worth of firms listed on Nigeria Stock Exchange. Hence, the financial capability of a firm may dictate its environmental responsibility including its reporting practices.

Signaling theory argues firm's motivation for providing information to their relevant stakeholders. The theory implies that a firm tends to provide information that is useful for individuals or groups of individuals who form impressions about the company values and its future performance based on the information at their disposal (Jones & Murell, 2001). Hence, firms that are socially responsible emit signals that identify and explain their underlying qualities.

For the past two decades, it is observed that large companies are more exposed to public scrutiny which made voluntary reporting a justification and means of legitimization for their practices (Bednárová et al., 2019). In relating environmental reporting with profitability, it is being argued that managers of profitable companies are more likely to provide more voluntary environmental disclosure in their annual reports to support continuation of their current position and to boost the level of current and future compensation.

It is also being done to utilize the financial resources of firm to influence administration's choice to take part in environmental sustainability. However, some believe that the relationship between environmental accounting and profitability is non-monotonic (Bassey et al., 2013). This is because less profitable firms may disclose more information to explain the reasons for the negative performance and reassure the shareholders about future growth.

Also, high liquidity firms are more likely to report more voluntary information to distinguish their companies from low liquidity firms (Khaled et al., 2011). Therefore, one might argue that corporate managers of companies with low liquidity ratio may publish more voluntary information in their annual reports to satisfy the information requirements of stakeholders. Critical examination of previous studies has inclined that researchers have not satisfactorily juxtaposed the relationship between firm’s financial performance and environmental reporting as to whether it support the signaling assumption or it is merely a resource dependence perspective.

Based on the conceptual and empirical review, it is noticed that many researchers (Ogar, 2018; Achoki et al., 2016; Nwaiwu & Oluka, 2018; Kamal, 2016; Odia & Imagbe, 2015; Magali et al., 2015; Makori & Jangogo, 2013; Bassey et al., 2013; Suttipun & Stanton, 2012; Echave & Bhati, 2010) have succeeded in examining the influence of environmental reporting on other variables like financial performance and they have stressed the prospective value and benefit environmental reporting can add to a firms’ financial performance. However, only few examined how the financial capability of a firm will influence its environmental sustainability practice as most studies used financial performances as a dependent variable.

Also, many studies concentrate only on a particular sector of the manufacturing industry. So, with an unpretentious effort to close the gap in literature, the study has made attempt to use the concept as dependent variable in other to assess the influence of financial performance determinants on environmental sustainability reporting. The study also expands the scope of previous studies by drawing sample from all sub-sectors of the manufacturing industry. In lieu of the aforementioned, it is hypothesized in a null form that;

3. Research Methods

The study adopted ex-post facto research design and content analysis to generate quantitative data from the annual reports of selected firms in order to achieve the stated objectives. The population consist of all the 67 manufacturing firms listed on the Nigerian Stock Exchange as at the year ended 2018. On the Nigeria Stock Exchange, manufacturing firms cut across 7 sectors which are; oil and gas, conglomerates, agriculture, consumable goods, industrial goods, healthcare and natural resources.

The environmental and social effects which the industrial operations of these manufacturing firms have on the environment have made them a subject of focus. Twenty-three firms (23) which represent 30% of the population were proportionally selected from the stratified sector to ensure each sub-sector have equal chance of being represented in proportion of their sizes. The annual reports were obtained from the website of these firms and the Nigerian Exchange Limited factbook.

Data gathered were analyzed using descriptive and inferential statistics. The descriptive statistics showed the mean, median, standard deviation, skewness and kurtosis and others. In order to test for multicollinearity of the data collected, heteroskedasticity test and auto-Correlation were conducted. Hausman Specification, LM test and Shapiro-Wilk test for data normality were also used to test the validity and reliability of the data before regression analysis was conducted.

Table 1

Distribution of selected listed manufacturing companies in Nigeria

Classification of Company	Total	Sample Size (30%)
Consumer goods	21	7
Industrial goods	14	5
Conglomerates	6	2
Healthcare	10	4
Agriculture	4	1
Oil and gas	8	3
Natural Resources	4	1
Total	67	23

Source: Author's compilation, 2025.

The period 2015 to 2024 was chosen for this study to capture the evolving dynamics of environmental sustainability reporting (ESR) in Nigeria, particularly as awareness and regulatory frameworks surrounding environmental sustainability intensified. Starting in 2015, the Nigerian manufacturing sector began experiencing heightened pressure from

both local regulators and international stakeholders to adopt more sustainable practices, influenced by the global shift toward environmental accountability.

Additionally, in 2015, Nigeria saw the enactment of policies and initiatives aimed at improving corporate environmental disclosures, such as the National Environmental Standards and Regulations Enforcement Agency (NESREA). The proposed model is premised on the idea of signaling theory which contends that firm's social performance and reporting practices is influenced by its financial capability and performance. The explanatory variables are Profit after Tax (PAT), Earnings per Share (EPS) and Liquidity Ratio (LR). How the variables are measured is shown in Table 2.

In order to assess the effect of firms' financial performance on environmental sustainability reporting of listed manufacturing firms in Nigeria, the model is stated thus;

$ESR_{it} = f(FP_{it})$

$ESR_{it} = f(PAT_{it}, EPS_{it}, LR_{it})$ *equation i*

$ESR_{it} = a + \beta_1 PAT_{it} + \beta_2 EPS_{it} + \beta_3 LR_{it} + e_{it}$ *equation ii*

Where; ESR = Environmental sustainability reporting; FPD = Financial performance; PAT = Profit after Tax; EPS = Earnings per Share; LR = Liquidity ratio.

Table 2

Measurement of Study Variables

S/N	Variables	Description	Measurement	Sources
1.	Environmental Sustainability Reporting (dependent)	It refers to drawing up reports regarding environmental responsibilities, environmental costs and other information relating to the environment and climate from a financial standpoint for the external users of the annual report.	If there is separate disclosure score, 3 was allotted; if it is in the chairman/director statement 2; if it is disclosed in the footnote to financial statement 1 and if not disclosed, the firm scored 0 (ESR indicators- environmental research & development, pollution control policy, waste management, water management, environmental award etc.)	(Khaled et al., 2011)
2.	Profit after Tax (Independent)	It is the earnings of a business after income taxes have been deducted	Net profit less income tax	Beredugo, 2014

3.	Earnings per share (Independent)	It is the portion of a company's profit that is allocated to every individual share of the firm	Total earnings after interest, tax, and preferred dividend divided by total numbers of ordinary shares outstanding	(Ahmad et al., 2018; Ahmed et al., 2017)

Source: Author's Compilation, 2025

4. Results and Discussion

Table 3

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Minimum	Maximum
ESR	230	1.4826	1.0561	0	3
PAT	230	1.97e+10	9.31e+10	-1.91e+11	1.03e+12
EPS	230	6.6509	25.941	-127.61	251.15
LR	230	1.3209	0.8601	0.1844	9.3873

Source: STATA 16.0 Output file 2026 (Appendix)

Table 3 shows the summary statistics of the study's data set based on the variable measurements. It revealed that, ESR has a mean of 1.4826 with a standard deviation of 1.0561, implying moderate disclosure on the 0–3 scale with observable differences across firms (minimum 0, maximum 3). Profit after tax (PAT) records a mean of ₦19,700,000,000 and a standard deviation of ₦93,100,000,000, with values ranging from −₦191,000,000,000 to ₦1,030,000,000,000, showing very wide variation in profitability.

Earnings per share (EPS) has a mean of 6.6509 and a standard deviation of 25.9410, spanning from −127.61 to 251.15, which suggests substantial differences in shareholder returns and the presence of negative earnings for some observations. In addition, the liquidity ratio (LR) has a mean of 1.3209 and a standard deviation of 0.8601, with a minimum of 0.1844 and maximum of 9.3873, indicating that although average liquidity is slightly above 1, some firms experienced weak short-term solvency while others held unusually high liquidity positions.

Table 4

Correlation Matrix

Variable	ESR	PAT	EPS	LR
ESR	1			
PAT	0.0147	1		
	0.8247			
EPS	0.1002	0.2077*	1	
	0.1297	0.0015		
LR	0.0085	-0.0565	0.0927	1
	0.8982	0.3935	0.1612	

Source: STATA 16.0 Output file 2026 (Appendix)

The correlation matrix results in Table 4 reveal that environmental sustainability reporting (ESR) exhibits very weak and statistically insignificant relationships with all the financial performance variables, suggesting limited linear association at the bivariate level. Specifically, ESR is weakly and positively correlated with profit after tax (PAT) (r = 0.0147, p = 0.8247) and earnings per share (EPS) (r = 0.1002, p = 0.1297), while its relationship with liquidity ratio (LR) is also positive but negligible (r = 0.0085, p = 0.8982).

These findings imply that variations in firms' profitability and liquidity do not strongly explain differences in environmental disclosure practices among listed manufacturing firms in Nigeria, which aligns with prior evidence that environmental reporting is often driven more by ethical, regulatory, or stakeholder considerations than by short-term financial outcomes (Ali & Hafez, 2014; Bednárová et al., 2019).

Among the explanatory variables, the correlation between PAT and EPS is positive and statistically significant (r = 0.2077, p = 0.0015), which is theoretically expected since higher profits generally translate into higher earnings available to shareholders. Other correlations among the independent variables are weak and insignificant, indicating that the model is unlikely to suffer from multicollinearity. Consistent with the guideline of Gujarati and Porter (2009), where correlation coefficients below ±0.80 suggest no serious multicollinearity problem, the results confirm the suitability of jointly including PAT, EPS, and LR in the regression analysis.

Table 5

Summary of Regression Results

ESR	**Coef.**	**T**	**P>|t|**	**VIF**	**1/VIF**
PAT	5.91e-11	3.29	0.001	1.00	0.996575
EPS	2.3632	1.49	0.137	1.00	0.996718
LR	3.1327	1.61	0.109	1.00	0.999697
_cons	-2.1525	-0.56	0.578		
R-sq	0.0633				
Prob>F	0.0020				
F-stats	5.09				
Hausman:					
Prob>chi2	0.0943				
Chi2	4.72				
LM Test:					
Chibar2	8.19				
Prob>chibar2	0.1021				

Source: STATA 16.0 Output file 2026 (Appendix)

The regression results in Table 5 shows that the model is jointly significant with F-statistic = 5.09 and Prob > F = 0.0020, meaning the explanatory variables (PAT, EPS, and LR) collectively explain variations in environmental sustainability reporting (ESR) at conventional significance levels. However, the R-squared = 0.0633 indicates that only about 6.33% of the variation in ESR is explained by these financial performance proxies, suggesting that ESR is likely influenced by other factors beyond profitability and liquidity.

Discussion of Findings

Profit After Tax and Environmental Sustainability Reporting

The results show that profit after tax (PAT) positively and significantly influences environmental sustainability reporting (ESR) in the sampled Nigerian manufacturing firms (Coef = 5.91e-11; p = 0.001), indicating that more profitable firms tend to disclose greater environmental information. This aligns with studies in the Nigerian manufacturing context which similarly found that profitability significantly affects environmental sustainability reporting, implying that financially robust firms are better positioned to engage in voluntary disclosures and absorb the costs associated with environmental initiatives (Igbekoyi, 2021).

Earnings Per Share (EPS) and Environmental Sustainability Reporting

Also, Earnings per share (EPS) shows a positive but statistically insignificant association with ESR in this study (Coef = 2.3632; p = 0.137), suggesting that while better per-share earnings may be associated with more environmental disclosure, this effect is not strong enough to be conclusive once profitability and liquidity are controlled. This result is consistent with Igbekoyi's (2021) findings, where EPS exhibited a positive but insignificant relationship with environmental reporting, indicating that EPS may not be a strong predictor of disclosure behaviour in the manufacturing sector.

Liquidity Ratio (LR) and Environmental Sustainability Reporting

The liquidity ratio (LR) also has a positive but statistically insignificant effect on ESR (Coef = 3.1327; p = 0.109), indicating that although firms with better short-term solvency appear slightly more inclined to disclose environmental information, liquidity does not robustly drive ESR in the manufacturing context. This is consistent with findings in some Nigerian studies, where liquidity's impact on sustainability reporting was weak or statistically insignificant, suggesting liquidity constraints are not a primary barrier to environmental disclosure practices in these firms.

Multicollinearity diagnostics (VIF and tolerance). The reported VIF values are approximately 1.00 for PAT, EPS and LR (with tolerance values close to 1), which indicates no multicollinearity concern i.e., the predictors are not linearly redundant and coefficient estimates are not being inflated by high inter-correlation. As a rule-of-thumb, VIF values above 10 are often treated as evidence of serious multicollinearity requiring attention; values near 1 imply essentially no inflation.

Hausman test (fixed vs random effects choice). The Hausman test reports Chi^2 = 4.72 with Prob > Chi^2 = 0.0943, which implies that at the 5% significance level you fail to reject the null hypothesis that the random effects estimator is consistent so random effects is generally preferred over fixed effects for this specification. At the 10% level, the result is borderline, meaning you should be transparent in reporting that the FE vs RE decision is somewhat sensitive to the chosen significance threshold.

Breusch–Pagan LM test (random effects vs pooled OLS). The LM test shows $Chibar^2$ = 8.19 with Prob > $Chibar^2$ = 0.1021, indicating that at the 5% level there is insufficient evidence that the random effects component is needed relative to pooled OLS (again, borderline at 10%). In applied panel work, if the LM test is not significant at 5%, pooled OLS may be adequate; however, since your Hausman result points more toward RE than FE (and the LM is close), you can justify proceeding with RE while clearly noting the LM test outcome and robustness-checking with pooled OLS as a sensitivity analysis.

5. Conclusion and Recommendations

The findings indicate that PAT has a positive and statistically significant effect on ESR, showing that firms with stronger overall profitability tend to disclose more environmental sustainability information. In contrast, EPS and LR exhibit positive but statistically insignificant relationships with ESR, implying that shareholder-return performance and short-term solvency do not reliably drive environmental reporting practices in the sampled firms.

Overall, the results suggest that while broad profitability (PAT) can strengthen the capacity and motivation for sustainability reporting, environmental disclosure behaviour is not fully explained by financial indicators alone, meaning other forces likely play major roles in shaping ESR in the Nigerian manufacturing sector.

Recommendations

Management of listed manufacturing firms should institutionalize environmental sustainability reporting by adopting clear reporting policies and standardized disclosure frameworks, rather than treating environmental disclosure as optional or dependent solely on financial conditions. Since profitability (PAT) significantly improves ESR, firms should allocate a defined portion of annual profits toward environmental compliance, pollution control, waste management, and sustainability initiatives, and ensure these activities are transparently disclosed in annual reports.

Regulators and market institutions should strengthen sustainability disclosure guidelines by issuing sector-specific minimum disclosure requirements, monitoring compliance, and encouraging consistent reporting across manufacturing sub-sectors to reduce the observed disclosure gaps. Investors and other stakeholders should increase engagement with firms by demanding clearer environmental performance metrics and evidence-based disclosures, which can help transform ESR into a routine accountability practice.

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