
ENVIRONMENTAL COST AND PERFORMANCE OF MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

The research examined the effect of environmental costs on the performance of manufacturing firms in Nigeria, with particular emphasis on education sustainability, community development, and social welfare costs. It used secondary data sourced from the Nigerian Exchange Group (NGX) Factbook and the annual reports of selected firms covering the period from 2018 to 2023. An ex-post facto research approach was used, and statistical analysis was performed with the Panel Least Squares Model. The findings indicated that the costs associated with education sustainability had a positive albeit statistically insignificant effect on the earnings per share (EPS) of publicly listed manufacturing firms in Nigeria, indicating that expenditures in education sustainability did not significantly affect financial performance. Conversely, community development costs shown a negative and substantial effect on EPS, suggesting that these charges detrimentally influenced the enterprises' financial performance. Social welfare costs had a positive although statistically negligible effect on EPS, indicating that investments in social welfare did not significantly affect performance. The research shows that environmental costs significantly affect the performance of manufacturing firms in Nigeria. Based on the findings, it is recommended that firms optimize their community development initiatives by identifying strategic projects that align with business objectives; companies should also invest more in their education sustainability programs to enhance their effectiveness in contributing to social development and improving business performance; additionally, manufacturing firms should refine their social welfare initiatives to ensure they provide meaningful benefits to both employees and society.

Keywords: Environmental costs, Education sustainability, Community development, Social welfare costs, Earnings per share, Manufacturing firms, Nigeria

1.0 INTRODUCTION

Environmental sustainability has become an increasingly pertinent issue in the global discourse surrounding business operations, particularly within the manufacturing sector. In Nigeria, where industrial activities contribute significantly to economic growth and development, the environmental impact of manufacturing firms has garnered heightened attention. As acknowledged by UNEP (2013), the manufacturing sector plays a crucial role in Nigeria's economy, but its operations often entail environmental costs that must be carefully assessed and mitigated to ensure long-term sustainability and performance.

Manufacturing firms in Nigeria grapple with complex challenges as they strive for sustainable growth and profitability, amidst global apprehensions surrounding environmental degradation and resource scarcity. As a developing nation undergoing rapid industrialization, Nigeria faces the pressing need to harmonize economic advancement with environmental preservation (Ogunba *et al.*, 2020). In this context, the environmental costs incurred by manufacturing firms emerge as a pivotal focal point of investigation, exerting profound implications on both corporate performance and environmental sustainability.

Environmental costs encompass a spectrum of expenditures borne by manufacturing firms in Nigeria, including those related to compliance with environmental regulations, pollution control measures, waste management, and initiatives aimed at fostering education sustainability, community development, and social security (Adeoti & Akanbi, 2018). These costs represent significant financial commitments for firms operating within Nigeria's manufacturing sector, necessitating investments in eco-friendly technologies and sustainable practices to mitigate adverse environmental impacts (Adegbe *et al.*, 2017). However, despite the apparent financial strain imposed by environmental expenditures, their strategic management holds the potential to yield long-term benefits in terms of operational efficiency, reputation enhancement, and regulatory compliance (Olusegun *et al.*, 2021).

Moreover, the environmental performance of manufacturing firms in Nigeria is subject to scrutiny by various stakeholders, including investors, consumers, regulatory bodies, and civil society organizations. With the rise of environmental consciousness and the emergence of sustainable investing trends, firms are increasingly pressured to demonstrate their commitment to environmental stewardship and social responsibility, encompassing education sustainability, community development, and social security initiatives (Achugamonu *et al.*, 2018). Failure to address these concerns adequately not only poses reputational risks but also undermines the long-term viability and competitiveness of manufacturing firms in the Nigerian market (Ayadi *et al.*, 2020).

Furthermore, the nexus between environmental cost management and corporate financial performance has garnered considerable attention in academic literature and business practice. Studies suggest that effective management of environmental costs, including those related to education sustainability, community development, and social security, can positively influence firm performance by reducing operational inefficiencies, enhancing resource productivity, and fostering innovation (Olusola *et al.*, 2018). Conversely, neglecting these environmental costs may lead to adverse financial consequences, including regulatory penalties, litigation costs, and reputational damage, thereby compromising the profitability and sustainability of manufacturing firms in Nigeria (Ogbeibu *et al.*, 2021).

Theoretical frameworks such as the Resource-Based View (RBV) and Stakeholder Theory offer valuable insights into the relationship between environmental costs and firm performance in the Nigerian manufacturing context (Nwaogwugwu *et al.*, 2022). RBV posits that firms can achieve sustainable competitive advantage by leveraging their internal

resources and capabilities, including environmental management practices, to mitigate costs and enhance performance (Ojo *et al.*, 2020). On the other hand, Stakeholder Theory emphasises the importance of considering the interests of various stakeholders, including regulators, communities, and consumers, in shaping firms' environmental strategies and performance outcomes (Olowolaju *et al.*, 2021).

Against this backdrop, this study seeks to investigate the effect of various environmental costs, including those associated with education sustainability, community development, and social security, on the financial performance of manufacturing firms in Nigeria.

Statement of the Problem

Despite growing awareness, theoretical underpinnings and empirical evidence of environmental concerns, the relationship between environmental costs and the performance of manufacturing firms in Nigeria remains relatively underexplored. There exist notable gaps in the literature regarding environmental costs and firm performance in Nigeria. Limited studies provide comprehensive analyses encompassing various industries and regions, thereby restricting the generalizability of findings (Obeng-Odoom *et al.*, 2023).

Previous studies have primarily focused on assessing environmental impacts or compliance with regulatory standards, often overlooking the broader implications of environmental and social costs on firm performance (Ogbonna *et al.*, 2019; Worimegbe, 2021; Ike *et al.*, 2024; Okulenu *et al.*, 2023; Iheduru & Chukwuma, 2019). While these studies have examined various dimensions of environmental costs and profitability, they have not specifically addressed the effects of education sustainability cost, community development cost, and social security cost on the earnings per share of manufacturing firms. This study seeks to fill this gap by exploring how these specific environmental and social expenditures affect the earnings per share of manufacturing firms in Nigeria.

Research Hypotheses

The following null hypotheses are listed to achieve the objective of the study:

1. There is no significant effect of education sustainability cost on the earnings per share of listed manufacturing firms in Nigeria.
2. Community development cost has no significant effect on the earnings per share of listed manufacturing firms in Nigeria.
3. Social security cost has no significant effect on the earnings per share of listed manufacturing firms in Nigeria.

2.0 LITERATURE REVIEW

Environmental Cost

Environmental costs refer to the expenses incurred as a result of company activities on the environment (Schaltegger & Burritt, 2017). These expenses include both direct and indirect financial expenditures associated with mitigating environmental damage, adhering to regulatory mandates, and executing sustainable practices (Rahman, 2020). Firms suffer expenses in several ways, including pollution control, waste management, resource depletion, and ecosystem restoration (Horngren *et al.*, 2018). These expenditures beyond financial implications and may also include reputational harm, legal liabilities, and enduring environmental deterioration (Epstein & Buhovac, 2014).

- **Education Sustainability Cost**

Education sustainability cost (ESC) is an essential component of environmental expenditure, including various costs intended to enhance environmental education and awareness in

communities. These initiatives include investments in programs, campaigns, and resources aimed at enhancing comprehension of environmental conservation and sustainability among diverse stakeholders (Adewole & Babalola, 2022). In Nigeria, where deforestation, pollution, and climate change are significant concerns, prioritising educational sustainability is essential. By investing funding to ESC, stakeholders may cultivate a culture of environmental accountability and motivate people to incorporate sustainable practices into their daily routines. ESC activities are crucial in equipping residents with the information and skills necessary to address pressing environmental issues and engage in collective sustainability efforts via training sessions, public awareness campaigns, and the dissemination of educational materials.

- **Community Development Cost**

Community development cost (CDC) encompasses financial allocations towards a diverse array of grassroots projects and initiatives intended to tackle environmental concerns and enhance the quality of life within local communities. These investments often target key areas such as clean water and sanitation, renewable energy deployment, and infrastructure enhancement in regions affected by environmental challenges (Ojo & Ogunleye, 2021).

- **Social Welfare Cost**

Social welfare cost (SWC) constitutes a comprehensive framework of expenditures aimed at addressing both social and environmental justice issues, ensuring fairness in resource allocation, and alleviating the adverse impacts of environmental degradation on vulnerable segments of the population. This encompasses a range of investments in healthcare infrastructure, social services provision, and poverty alleviation programmes, all targeted at communities disproportionately affected by environmental pollution and degradation (Oladunjoye & Adekoya, 2023).

Performance of Manufacturing Firms in Nigeria

The performance of manufacturing companies in Nigeria is of significant interest to scholars, policymakers, and industry stakeholders. In this context, performance denotes the efficiency, productivity, profitability, and overall success of manufacturing firms within the Nigerian economy. According to Ogunleye and Ojo (2020), the success of manufacturing companies in Nigeria is influenced by several variables, including macroeconomic circumstances, government policies, technical advancements, and market dynamics. These elements together establish the competitive landscape and affect enterprises' capacity to thrive and expand in the market. Olowookere et al. (2019) emphasise the importance of operational efficiency and cost management in improving the performance of manufacturing companies in Nigeria. The research finds efficient manufacturing processes, robust supply chain management, and prudent financial management procedures as critical components that enhance business success.

Earnings Per Share (EPS)

A company's capacity to make money for its shareholders is gauged by its earnings per share (EPS), which also shows how well its operations and financial management are doing (Adegbite & Ogunleye, 2021). Investors, analysts, and policymakers often utilise earnings per share (EPS) as a crucial performance metric to evaluate the financial stability and investment potential of manufacturing firms in Nigeria (Olowookere et al., 2020). While lower EPS numbers may indicate operational inefficiencies or financial challenges within the organisation, higher EPS values indicate improved profitability and increasing shareholder

value. Additionally, EPS serves as a standard by which manufacturing companies in the same industry or in separate sectors may be evaluated (Adewole & Yusuf, 2019). Stakeholders may get important insights into the relative strength and competitiveness of Nigerian manufacturing enterprises by looking at EPS changes over time and contrasting them with industry norms and rivals' outcomes.

Theoretical Foundation

- **Resource-Based View (RBV)**

Penrose first presented the Resource-Based View (RBV) theoretical framework in 1959, and Barney subsequently developed it in 1991. Fundamentally, RBV argues that businesses may successfully use their distinct resources and competencies to gain a long-term competitive edge. According to this notion, businesses may create valuable environmental resources by investing in environmentally friendly activities and technology. Adopting eco-friendly manufacturing techniques or clean energy solutions, for instance, may lessen their negative effects on the environment while simultaneously providing competitive benefits including lower costs, regulatory compliance, and improved brand recognition (Barney, 1991).

Businesses may become leaders in environmental stewardship and enhance their long-term performance and competitiveness by implementing ecologically friendly strategies. Businesses may lower environmental risks and take advantage of possibilities brought about by consumers' increasing demand for eco-friendly goods and services by making strategic investments in sustainable resources and skills. Consequently, the Resource-Based View offers a theoretical framework for comprehending how businesses might integrate environmental considerations into their strategic choices, resulting in long-term value generation and a competitive edge.

- **Stakeholder Theory**

Stakeholder Theory, introduced by Freeman in 1984, provides the perspective that firms operate within a broader network of stakeholders, including shareholders, customers, employees, communities, and others. The theory asserts that businesses have an obligation to consider the interests of these stakeholders when making decisions. From an environmental cost viewpoint, firms that actively address environmental concerns by investing in sustainable practices can strengthen their relationships with stakeholders. By showcasing their commitment to environmental responsibility, firms can enhance their reputation and goodwill among stakeholders, which can ultimately lead to better firm performance (Freeman, 1984).

In essence, Stakeholder Theory highlights the importance of incorporating the diverse interests of stakeholders, including environmental factors, into business decision-making. By emphasizing environmental sustainability and engaging actively with stakeholders, firms can cultivate stronger relationships, build trust, and contribute to long-term success and sustainability.

- **Institutional Theory**

The 1983 development of Institutional Theory by DiMaggio and Powell offers crucial insights into how external institutional influences resulting from cultural values, social conventions, and legal frameworks impact businesses. The theory contends that the larger institutional context in which businesses function has a considerable influence on them in addition to internal issues. About environmental concerns, businesses may become more legitimate and socially acceptable if they match their activities with environmental laws and society norms about environmental responsibility.

In accordance with Institutional Theory, stakeholders, including investors, consumers, and regulatory bodies, see companies that follow environmental laws and implement sustainable practices as legitimate. According to DiMaggio and Powell (1983), these companies improve their credibility and reputation by conforming to environmental stewardship standards and ideals. This may have a favourable effect on their performance and long-term market presence. The necessity of comprehending and reacting to external institutional constraints in influencing corporate behaviour and results is ultimately emphasised by institutional theory. Businesses who recognise and respond to these demands by implementing eco-friendly procedures not only strengthen their reputation but also set themselves up for long-term success in a market that is becoming more and more concerned with sustainability.

Empirical Review

Worimegbe's (2021) research examined the effects of environmental expenses on the profitability of Nigerian listed manufacturing companies between 2007 and 2017. The study purposefully chose 20 manufacturing businesses from a pool of 60 companies listed on the Nigerian Stock Exchange using an ex-post facto research approach. Over the course of eleven years, from 2007 to 2017, the research collected information from the firms' standalone environmental statements, annual reports, and accounts. The expenditures associated with staff environmental education and community environmental projects served as a representation of environmental costs. Meanwhile, the DuPont return on equity ratio was used to gauge profitability. Environmental costs had no significant effect on operating efficiency ($F = 0.5158$, $p = 0.72$) at the 5% significance level, but they had a significant impact on the equity multiplier ($F = 3.3301$, $p = 0.01$) and asset use efficiency ($F = 3.368$, $p = 0.01$), according to the results of the panel random-effect regression analysis. The research found that the equity multiplier and asset utilisation efficiency were the main drivers of the considerable increase in return on equity for listed manufacturing companies in Nigeria throughout the study period. As a result, the research verified that environmental costs significantly affect the financial performance of manufacturing firms that are listed in Nigeria.

The research by Okunlenu, Olusanya, and Ogunbajo (2023) examined how the performance of selected Nigerian manufacturing firms was affected by environmental accounting reporting. The study used an ex post facto approach and secondary data gathered from the yearly financial reports of industrial companies listed in Nigeria. The research focused on a number of sub-variables associated with Environmental Accounting Reporting (EVARP), such as the costs of waste management (WMC), community development, and worker health and safety. The research evaluated three performance metrics: return on equity (ROE), return on assets (ROA), and profit margin. Canonical correlation analysis and SPSS version 26 were used for data analysis. The findings showed a high correlation between the environmental accounting reporting procedures of several Nigerian industrial companies and their growth and development. Given that the majority of businesses do not declare their environmental actions, the research suggests that environmental accounting be made a required part of yearly reports at all levels of government.

The research by Ike, Adeneye, and Anuolam (2024) investigated how environmental protection expenditures (EPE) affected the bottom line of industrial goods firms in Nigeria. As indicators of financial performance, the research used earnings per share (EPS), return on equity (ROE), and return on assets (ROA). From 2011 to 2020, information was gathered from the sustainability and annual reports of a few chosen industrial goods firms. Text analysis was used to collect information on environmental protection expenditures, while

accounting data from the firms' reports was used to determine ROA and ROE. The data that was gathered was examined using panel regression analysis. The findings indicated that EPE had a little negative influence on both ROA and EPS and a slight favourable impact on ROE. The research came to the conclusion that Nigerian industrial goods companies environmental protection reporting and expenditure practices are insufficient, and that these expenditures have not substantially improved their financial performance.

The research by Ezenwafor, Christy, and Nene (2024) looked at how environmental expenses affected the profitability of consumer products firms in Nigeria between 2013 and 2022. The study addressed two research topics and assessed two hypotheses at the 0.05 level of significance. The study used an ex-post facto research approach and included sixteen consumer products businesses that were listed on the Nigerian Stock Exchange as of January 2023. Companies have to have released annual reports between 2013 and 2022 in order to be included for the research. Panel Least Squares regression was used to evaluate the hypotheses, and Pearson Product Moment Correlation was used to analyse the study issues. According to the statistics, which came from these annual reports, environmental spending had a very little positive impact on operating profit margin but a moderate positive impact on earnings per share.

Iheduru and Chukwuma's (2019) research investigated the connection between Nigerian manufacturing firms' social and environmental costs and their performance. The study set out to investigate the relationship between these companies' performance and the social and environmental effects of their activities. Fourteen randomly chosen Nigerian manufacturing enterprises' annual reports and accounts provided the study's data. A variety of regression models were used in the investigation. The findings showed that social and environmental costs were significantly positively correlated with both dividends per share (DPS) and net profit margin (NPM). Nonetheless, a substantial inverse relationship was seen between environmental and social costs and both ROCE and EPS.

3.0 METHODOLOGY

This study adopts the ex-post facto research design which is appropriate since the variables under investigation are obtained from annual reports of manufacturing firms and cannot be manipulated by the researcher as they have already occurred. Ex-post facto design allows for systematic empirical inquiry by examining the relationships among variables without altering them. The population of the study comprises the entire manufacturing industry in Nigeria, covering data from 2018 to 2022, but due to practicality and data availability, a sample of ten manufacturing firms was selected using judgmental sampling. These firms include Shell Petroleum Development Company, Julius Berger, Lee Engineering and Construction Company, Welltec Construction, SEPLAT, Flour Mills of Nigeria Plc, BUA Cement, Aluminium Extrusion Industries Plc, Berger Paints, and Cadbury Plc, chosen because of their relevance and accessibility of financial information. Data were collected from secondary sources, specifically the published annual reports of these firms for the study period. For the method of analysis, both econometric and statistical techniques were employed. Econometric analysis included trend analysis to evaluate patterns and tendencies in the variables over time, descriptive statistics to summarize the data and panel least squares regression to estimate the impact of cost structure, sales volume, and pricing decisions on profitability.

Model Specification

In capturing the variables in the study, the model is presented in a functional form as shown below:

$$Y = f(\text{Explanatory variables}) + \text{error term} \quad (\text{i})$$

Where Y = Dependent Variable “manufacturing firms’ performance”

X = Independent Variable which was represented by education sustainability costs (EDSC), community development costs (CMDC), and social security cost (SOSC).

The multiple linear regression models for this study are defined as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \quad (\text{ii})$$

$$\text{EPS} = \beta_0 + \beta_1 \text{EDSC}_{t1} + \beta_2 \text{CMDC}_{t2} + \beta_3 \text{SOSC}_{t3} + e \quad (\text{iii})$$

Where:

β_0 =Constant; e = Error term; β_{1-3} = Coefficient of the independent variables

EPS= Manufacturing Firms Earnings per Share; EDSC= Education sustainability costs

CMDC = Community development costs; SOSC = Social security cost

4.0 RESULTS AND DISCUSSION

Results Presentation of Data

The data employed in this study were obtained from various annual report of ten (10) selected manufacturing firms listed in the Nigerian Exchange Group, and are presented in the table 4.1 (See Appendix I). The data is presented in tabular form with the manufacturing firms performance measured by earnings per share (FEPS) as the dependent variable, in naira per share; while Environmental Cost measured by education sustainability cost (EDSC), community development cost (CMDC), and social welfare cost (SWLC), as independent variables, all in million naira (₦, Million).

Trend Analysis

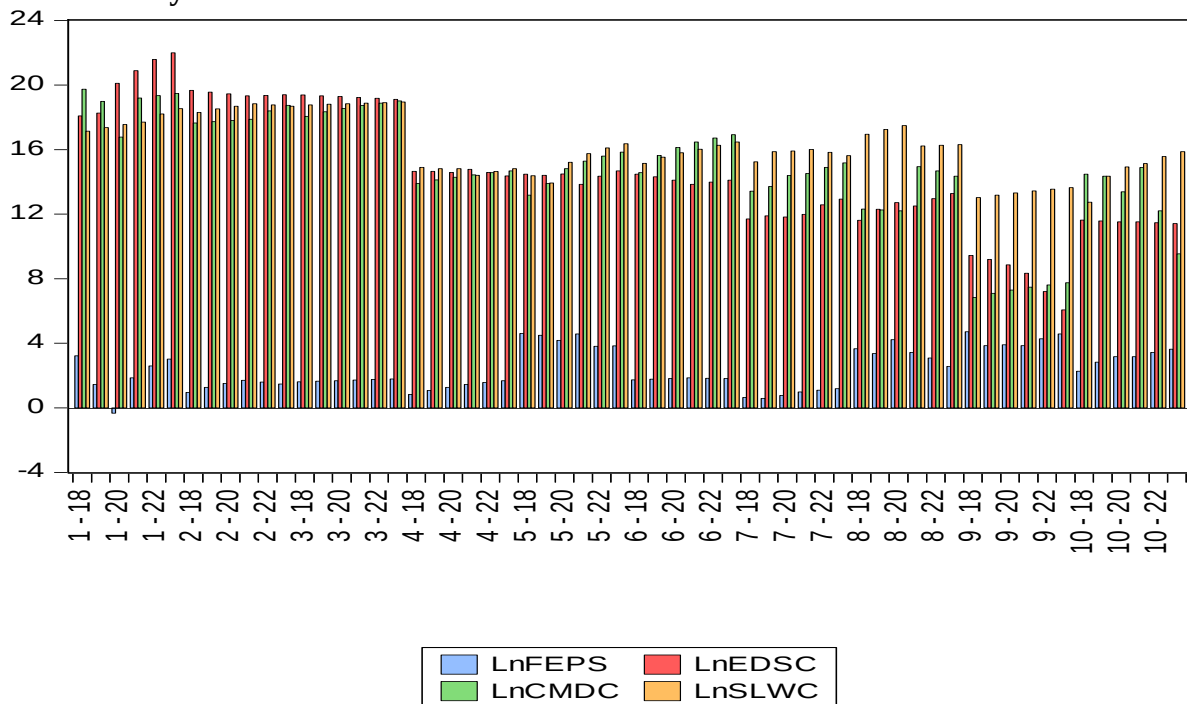


Fig 1 Trend Analysis Graph

The trend analysis shows noticeable fluctuations in the variables over the study period, with sales volume cost (LnSLWC) and commodity cost (LnCMDC) maintaining consistently higher values compared to firm earnings per share (LnFEPS), which remained relatively lower and less volatile. Education cost (LnEDSC) and commodity cost follow similar upward and downward movements, reflecting their sensitivity to changes in firm operations and market dynamics. Sales volume cost exhibits a dominant trend, suggesting its strong

influence on firm activities and profitability, while firm earnings per share displays more stability with modest variations. Overall, the graphical trend indicates that cost-related variables exert substantial influence on firm outcomes, underscoring their importance in understanding the cost-volume-profit relationship in the Nigerian manufacturing sector.

Table 1. Descriptive Result

	LnFEPS	LnEDSC	LnCMDC	LnSLWC
Mean	2.400494	14.64217	14.90342	16.17863
Median	1.824503	14.32918	14.85305	15.95555
Maximum	4.709530	21.99964	19.73884	18.94336
Minimum	-0.334405	6.064220	6.837333	12.74752
Std. Dev.	1.273037	3.794105	3.375991	1.798422
Skewness	0.261766	0.110815	-0.832585	0.044653
Kurtosis	1.954108	2.308962	3.274090	2.000098
Jarque-Bera	3.419943	1.316634	7.119797	2.519449
Probability	0.180871	0.517722	0.028442	0.283732
Sum	144.0296	878.5305	894.2049	970.7178
Sum Sq. Dev.	95.61671	849.3186	672.4417	190.8250
Observations	60	60	60	60

Source: Eview 10

The descriptive statistics show that firm earnings per share (LnFEPS) has an average of 2.40 with moderate variation, while education cost (LnEDSC) and commodity cost (LnCMDC) recorded higher means of 14.64 and 14.90 respectively, reflecting their larger scale. Sales volume cost (LnSLWC) has the highest mean of 16.18, indicating its dominant role in firm operations. The results suggest that most variables are fairly normally distributed, although LnCMDC shows mild skewness and significant Jarque-Bera probability, implying potential deviations from normality that may influence regression outcomes.

Regression Analysis

Table 2: Panel Least Square Regression Result

Dependent Variable: LnFEPS

Method: Panel Least Squares

Date: 09/17/25 Time: 09:17

Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.250309	1.681853	3.121741	0.0031
LnEDSC	0.004904	0.103168	0.047530	0.9623
LnCMDC	-0.218687	0.105042	-2.081894	0.0429
LnSLWC	0.019662	0.156509	0.125631	0.9006
R-squared	0.787245	Mean dependent var		2.390378
Adjusted R-squared	0.740761	S.D. dependent var		1.266156
S.E. of regression	1.103256	Akaike info criterion		3.111028
Sum squared resid	55.99002	Schwarz criterion		3.263989
Log likelihood	-73.77569	Hannan-Quinn criter.		3.169276
F-statistic	6.179437	Durbin-Watson stat		1.967677
Prob(F-statistic)	0.001282			

Source: Eview 10

Hypotheses Testing

Decision Rule: If the test statistic falls within the critical region or the p-value is less than 0.05, the null hypothesis is rejected. Conversely, if the test statistic falls outside the critical region or the p-value exceeds 0.05, the null hypothesis is not rejected.

Hypothesis One

There is no significant effect of education sustainability cost on the earnings per share of listed manufacturing firms in Nigeria.

Based on the data presented in the table, it is evident that education sustainability cost yields a t-statistic value of 0.047530 with a probability value of 0.9623, which is beyond the predetermined level of significance of 0.05. Consequently, one can infer the presence of a positive but statistically insignificant effect of education sustainability cost on earnings per share.

Decision: Based on the results, we reject the null hypothesis. Therefore, it can be concluded that education sustainability cost does exert an insignificant effect on the earnings per share of listed manufacturing firms in Nigeria.

Hypothesis Two

Ho₂: Community development cost has no significant effect on the earnings per share of listed manufacturing firms in Nigeria.

Community development cost has a t-statistic value of -2.081894 and a p-value of 0.0429, both of which are below the predefined significance threshold of 0.05, as can be seen from the table. Thus, the research comes to the conclusion that earnings per share of Nigerian listed manufacturing companies are negatively but significantly affected by community development costs.

Hypothesis Three

Social security cost has no significant effect on the earnings per share of listed manufacturing firms in Nigeria.

The social security cost variable has a t-statistic value of 0.125631 and a p-value of 0.9006, both of which are above the predefined significance threshold of 0.05, as can be seen from the table analysis. These results show that social security cost has a beneficial but non-significant effect on earnings per share of Nigerian listed manufacturing companies, leading us to accept the null hypothesis and reject the alternative.

Discussion of findings

Both theoretical and empirical literature support and broaden the study's results on how environmental costs affect Nigerian manufacturing companies' performance. The research found that the cost of education sustainability has a beneficial but insignificant effect on Nigerian manufacturing companies' earnings per share (EPS). Since no prior research has directly examined the effect of education sustainability cost on earnings per share (EPS) in manufacturing firms, this discovery provides a novel addition to the present body of literature. Investments in environmental sustainability frequently have a delayed effect on firm performance, according to related studies like Worimegbe (2021), which looked at the impact of environmental costs on profitability. This supports the notion that sustainability costs may not produce immediate financial returns but can have long-term benefits.

However, the research discovered that the cost of community development had a negative and significant effect on EPS. Stakeholder Theory emphasises the significance of taking into account the interests of several stakeholders, including communities, when making corporate

choices, and this conclusion is consistent with that theory (Freeman, 1984). Iheduru and Chukwuma (2019) found that environmental and social costs significantly affected financial performance, especially Return on Capital Employed (ROCE) and EPS. This negative association is in line with their results. Worimegbe (2021) further supported the substantial adverse effect shown in this research by emphasising that, while community development expenses might be advantageous in the long run, they often have a detrimental short-term effect on profitability.

Additionally, the research discovered that social welfare cost had a beneficial but non significant effect on EPS. The concept of Institutional Theory, which contends that social welfare expenditures may improve a company's legitimacy and reputation and hence have an indirect effect on its performance, helps explain this outcome (DiMaggio & Powell, 1983). Since no empirical studies have explicitly looked at how social welfare costs affect EPS in manufacturing companies, this discovery adds a novel aspect to the body of research. However, analogous studies that have looked at how environmental and social costs affect performance, such those by Okunlenu et al. (2023) and Ike et al. (2024), have shown that they have a positive but negligible effect on profitability metrics like ROA and ROE. In line with the positive but negligible effect shown in this research, these studies emphasise that while social welfare programs may enhance a company's stakeholder relationships and public image, their immediate financial benefit is often small. The study's conclusions imply that environmental costs significantly impact Nigerian manufacturing companies' performance. This is consistent with other research that examined the effect of social and environmental costs on financial performance, such Worimegbe (2021) and Iheduru and Chukwuma (2019).

5.0 CONCLUSION AND RECOMMENATIONS

Conclusion

This research examined the effect of environmental cost on the performance of manufacturing firms in Nigeria, specifically on educational sustainability, community development, and social welfare costs. The findings indicated that education sustainability costs had a positive yet statistically insignificant effect on the earnings per share (EPS) of publicly listed manufacturing firms in Nigeria, suggesting that investments in education sustainability did not meaningfully affect the firms' financial performance during the study period. Conversely, community development cost had a negative but substantial effect on EPS, indicating that investment in community development projects correlated with a deterioration in the enterprises' financial performance. This conclusion indicates that while community development initiatives may provide many non-financial advantages, they could also diminish short-term profitability. Conversely, social welfare expenditures had a negative albeit statistically negligible effect on EPS, suggesting that investments in social welfare initiatives did not materially affect the financial performance of the firms analysed in the research. The findings underscore the significance of community development expenditures in affecting the financial performance of manufacturing firms, while also indicating the necessity for additional research to evaluate the long-term efficacy of educational sustainability and social welfare initiatives in the Nigerian manufacturing sector.

Recommendations

Based on the findings of the study, several recommendations can be proposed:

1. **Optimise Community Development Initiatives:** Given the positive effect of community development costs on the earnings per share (EPS) of manufacturing firms, it is advisable for companies to continue investing in community development projects. Firms should identify strategic community development initiatives that align

with their business objectives and have a tangible positive impact on local communities.

2. **Review Education Sustainability Investments:** Although education sustainability costs did not show a significant effect on EPS, it is important for manufacturing firms to critically assess their investments in education sustainability. Companies should review their education sustainability programmes to ensure that they are effectively contributing to both social development and business performance.
3. **Enhance Social Welfare Programmes:** Despite the non-significant effect on EPS, manufacturing firms should not neglect their social welfare initiatives. However, it is recommended that companies evaluate and refine their social welfare programmes to ensure they are targeted towards areas where they can have the greatest impact on both employees and society.

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APPENDIX 1:

Logged Data of Environmental Cost and Manufacturing Firms Performance

YEAR	COMPANY	S/N	LnFEPS	LnEDSC	LnCMDSC	LnSLWC
2018	Shell petroleum Development Company	1	3.21881	18.0857	19.73884	17.1404
2019		1	1.4422	18.2586	18.99272	17.3682
2020		1	-0.3344	20.1168	16.77446	17.5537
2021		1	1.86408	20.885	19.1896	17.71
2022		1	2.60121	21.5902	19.34724	18.211
2023		1	3.02091	21.9996	19.48338	18.5432
2018	Julius Berger	2	0.95166	19.6702	17.64419	18.3047
2019		2	1.27257	19.5691	17.72768	18.5185
2020		2	1.51513	19.4565	17.80474	18.6946
2021		2	1.71019	19.3296	17.87628	18.8442
2022		2	1.59737	19.3641	18.40413	18.7722
2023		2	1.47018	19.3974	18.74781	18.6946
2018	Lee Eng & Cons Co.	3	1.60744	19.3848	18.06586	18.7722
2019		3	1.64673	19.3363	18.34058	18.8088
2020		3	1.68455	19.2852	18.55587	18.8442
2021		3	1.72098	19.2315	18.73292	18.8784
2022		3	1.75613	19.1746	18.88328	18.9114
2023		3	1.79009	19.1143	19.01397	18.9434
2018	Welltec Construction	4	0.83291	14.6507	13.90293	14.9048
2019		4	1.075	14.6517	14.11544	14.824
2020		4	1.26695	14.5878	14.29062	14.824
2021		4	1.44456	14.7719	14.43963	14.4133
2022		4	1.57277	14.5898	14.56929	14.6396
2023		4	1.6864	14.3671	14.68405	14.824
2018	SEPLAT	5	4.60089	14.4782	13.18041	14.3863
2019		5	4.49416	14.4117	13.90462	13.9321
2020		5	4.18205	14.4857	14.81732	15.2112
2021		5	4.57636	13.8525	15.28005	15.7424
2022		5	3.81419	14.3493	15.60215	16.1004
2023		5	3.83902	14.6797	15.84539	16.3634
2018	Flour Mills of Nigeria Plc	6	1.73342	14.4772	14.56724	15.1536
2019		6	1.77495	14.3091	15.63374	15.5345
2020		6	1.81483	14.107	16.13802	15.8096
2021		6	1.85317	13.8533	16.47167	16.0252
2022		6	1.83418	13.9881	16.72141	16.2731
2023		6	1.81483	14.107	16.92108	16.4717
2018	BUA Cement	7	0.63658	11.6966	13.42643	15.2481
2019		7	0.58222	11.8961	13.70758	15.8784
2020		7	0.76081	11.822	14.39538	15.9073
2021		7	0.97833	11.9955	14.52161	16.0038
2022		7	1.09192	12.5707	14.90061	15.8307

2023		7	1.19392	12.9336	15.17479	15.6212
2018	Aluminium Extrusion Industries PLC	8	3.66356	11.62	12.31346	16.9504
2019		8	3.3673	12.3104	12.259	17.2555
2020		8	4.21951	12.715	12.2014	17.4889
2021		8	3.43399	12.5062	14.93979	16.2276
2022		8	3.09104	12.9622	14.68722	16.2702
2023		8	2.56495	13.2742	14.34849	16.3111
2018	Berger Paints	9	4.70953	9.44747	6.837333	13.0297
2019		9	3.85015	9.19441	7.096721	13.1854
2020		9	3.91202	8.85481	7.302496	13.3201
2021		9	3.85015	8.33663	7.473069	13.4388
2022		9	4.27667	7.20043	7.618742	13.5449
2023		9	4.57471	6.06422	7.745868	13.6408
2018	Cadbury PLC	10	2.27419	11.6327	14.47202	12.7475
2019		10	2.82316	11.5825	14.34895	14.3487
2020		10	3.17555	11.5296	13.38196	14.9355
2021		10	3.17555	11.5296	14.88878	15.1379
2022		10	3.4356	11.4738	12.21446	15.5734
2023		10	3.64179	11.4147	9.54014	15.8758