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**Ajayi Oluwafemi Ezekiel**  
Department of Accounting and  
Finance, Usmanu Danfodiyo  
University, Sokoto, Nigeria

**Nkasi E Ernest**  
Department of Accountancy  
School of Business and  
Management Technology,  
Federal Polytechnic, Bali,  
Taraba State, Nigeria

**Corresponding Author:**  
**Ajayi Oluwafemi Ezekiel**  
Department of Accounting and  
Finance, Usmanu Danfodiyo  
University, Sokoto, Nigeria

## Environmental accounting practices and profitability of quoted industrial goods sector in Nigeria

**Ajayi Oluwafemi Ezekiel and Nkasi E Ernest**

### Abstract

The study therefore aims at accessing environmental accounting practices and profitability of quoted industrial goods sector in Nigeria. The study's population consists of all publicly quoted Industrial Goods Sector on the Nigerian Stock Exchange (22). From 2010 to 2021, a sample size of ten (10) out of the total population was drawn. The regression model used by the researcher is a Fixed Effects Model, a Random Effects Model, and a Pooled Ordinary Least Square (OLS) model with panel data. The researcher used the Hausman and Wald tests to choose the best appropriate regression model with the maximum explanatory power. The result revealed that ROA has a mean of 6.532658, median of 5.900000, standard deviation of 4.663992, skewness index of 0.874641. EnA shows a mean of 2369618, a median of 229141.0, and standard deviation of 5293062 does not have a significant effect on the ROA since the p-value is greater than the 0.05. The study concluded that Environmental accounting does not have significant effect on return in asset which means other factors are more responsible for decline in the ROA of quoted Industrial Goods Sector in Nigeria.

**Keywords:** Return on asset (ROA), Nigerian stock exchange (NSE), industrial goods sector (IGS)

### Introduction

Businesses in the industrial goods sector make and sell machinery, equipment, and supplies that are used to produce other goods rather than sold directly to consumers. The industrial goods sector includes companies involved with aerospace and defense, industrial machinery, tools, lumber production, construction, and waste management.

Supply and demand for building construction in the residential, commercial, and industrial real estate divisions, as well as demand for manufactured goods, determine the performance of the industrial goods sector. When the economy declines during a recession, businesses postpone expansion and manufacture fewer items, which reduce activity in this sector. The industrial goods sector, on the other hand, covers a large range of subsectors, thus there is generally at least one area of development. The study therefore aims at accessing environmental accounting practices and profitability of quoted industrial goods sector in Nigeria. The society has given businesses social duties, which has made the business climate more competitive. The environmental factor, which will undoubtedly draw cost if corporations comply, is an essential feature of corporate social responsibility being integrated into business concepts.

The widespread knowledge of stakeholders about the environmental effect of businesses' economic operations has presented a threat to traditional financial reporting as a means of evaluating their success (Malik & Mittal, 2015) <sup>[7]</sup>. As a result, environmental policies have been viewed as a cost of expansion and financial performance for businesses (Nwaiwu & Oluka, 2018) <sup>[8]</sup>.

Environmentally sustainable methods must, however, be ethically desired for every environmentally responsible organization, in addition to regulatory compliance (Okoye & Asika, 2013) <sup>[6]</sup>. However, for many businesses, the financial resources required to engage in environmental accounting may be a barrier. This is because developing and implementing an environmental protection plan may be expensive, increasing a company's product cost and so affecting its financial success (Ebieri, 2018) <sup>[4]</sup>.

When it comes to environmental reporting and profitability, it's been suggested that managers of prosperous firms are more inclined to make more voluntary environmental disclosure in their annual reports in order to keep their existing jobs and increase their current and future income.

It's also being done to use the company's financial resources to sway the administration's decision to participate in environmental sustainability. Some argue, however, that the link between environmental accounting and profitability is not one-to-one (Bassey, Sunday & Okon, 2013) <sup>[3]</sup>.

The variance in opinion and conclusions between these studies might be attributed to varied perspectives among firm stakeholders on the social and economic consequences of environmental reporting methods, as well as the extent of these research' coverage. The study aims to investigate environmental accounting methods and profitability of the listed industrial products industry due to the inconclusive nature of prior studies' conclusions. Manufacturing enterprises were chosen as the focus of this study because they are a highly environmentally sensitive industry that is also subjected to increased social pressure as a result of visible ecological distress caused by their industrial operations. Introduction, literature and theoretical review, data and methodology, findings and discussion, conclusion and suggestions are the five components of the study.

### Statement of the problem

Because of the expanding population and limiting natural resources, governments and corporations are realizing that business as usual will not operate in the future. Chemicals released into the atmosphere, water, land, and other waste as a result of the current linear economic model are causing health problems for people and other creatures (Ellen Macarthur Foundation, 2012) <sup>[13]</sup>. As the human population grows, material demand rises, and manufacturing technology advances, the amount and quality of environmental resources are progressively dwindling (Vlek & Steg, 2007) <sup>[9]</sup>.

Freshwater shortages, overfishing of the oceans, global warming, extreme weather events, air pollution, water pollution, environmental noise, and complete disdain for the local environment, much alone the future environment, are all grounds for concern. Flooding, drought, and severe heat and cold are all unwanted climatic changes caused by global warming, which is roughly two degrees Celsius beyond pre-industrial levels.

The fact that Nigeria's waste generation rate is estimated to be 0.65-0.95 kg/capita per day, resulting in an annual average of 42 million tons, with plastic bottles accounting for 150,000 and solid waste accounting for 32 million tons annually, respectively, is concerning. Only 20-30 percent of this waste is collected (Iheanachor, 2021) <sup>[5]</sup>.

### Objectives of the study

1. The study aims at assessing the impact of Environmental accounting on the profitability of quoted Industrial Goods Sector in Nigeria.
2. Examine the relationship between Environmental accounting on the profitability of quoted Industrial Goods Sector in Nigeria.

### Significance of the study

This study will place emphasis on environmental accounting practice amongst quoted Industrial Goods Sector in Nigeria. It will enlighten the general public, accountant and management of business scale enterprise on environmental accounting practice. It would also add to the available literature on the area of study while also providing a platform for other students and researchers who may want to

further this study.

### Scope of the study

The population of the research is made up of all publicly traded Industrial Goods Sector companies on the Nigerian Stock Exchange.

A sample of twenty-two (22) listed manufacturing enterprises on the Nigerian Stock Exchange WAS carefully selected from 2010 to 2021 which is a period of 12 years.

The chosen organizations were chosen based on the fact that they are manufacturing enterprises that are listed in the Industrial Goods Sector.

This means that the researcher will look at all of the companies in the quoted Industrial Goods Sector.

Their acts are regarded to have a higher societal influence, as seen by their financial records.

As a consequence, the findings from the companies that were sampled may be applied to the overall population.

Environmental expenditure was used as a metric for measuring environmental accountability, the dependent variable for performance will be represented by proxy which is return on asset, whereas the independent variable will be represented by environmental accounting practice.

### Literature Review

Enahoro (2019) <sup>[10]</sup> in his investigation with the federal ministry of environment, EIA study conducted by the oil & gas (exploration and producing) manufacturing and other companies having activities that impact on the environment has been accepted as a regulatory requirement in Nigeria. Achieving effective EIA is however fraught with uncertainties in Nigeria since the objective estimation of input and output values is not so reliable.

Besides, there is excessive fluctuation in the discount factor for purpose of benefit-cost analysis. Non-available market values for certain natural resources costs and benefits such as the fauna, fishing pods or rivers, among others, makes it extremely difficult to place a monetary value on the factors of measurement.

Epstein (2020) <sup>[11]</sup> explains the pertinent aspect of environmental degradation and cost as those including emissions into the air, water and land. It also includes aspects of untreated domestic waster outflows into the river and coastal oceans and quantities of solid water that must then be disposed of perhaps through land spreading or incineration. Pollution includes airborne SO<sub>2</sub> emissions from power plants by stack – gas scrubbing which leaves a highly concentrated sludge and degradation which incorporated midnight dumping, illegal dumping along the sides of roads or in remote areas.

Hughes (2001) <sup>[12]</sup> examined environmental disclosures made by U.S. manufacturing firms in 1992 and 1993 using a modified Wiseman index to measure disclosures in the president's letter, MD&A, and notes sections of the annual report, and the CEP rankings to proxy for environmental performance. They found that firms rated as poor by the CEP generally make the most disclosures.

Al-Tuwaijri (2020) <sup>[2]</sup> employed simultaneous equations approach to investigate the relations among environmental disclosure, environmental performance and economic performance. They used proxy for environmental performance using the percentage of total waste generated recycled as identified using the TRI database and measure environmental disclosure using content analysis in four

categories, potentially responsible parties' designation, toxic waste, oil and chemical spills, and environmental fines and penalties, disclosures which are largely non-discretionary. Based on these proxies, Al-Tuwaijri *et al.* (2004) [2] documented a positive association between environmental performance and environmental disclosure. Bassey, Sunday & Okon (2021) [2] on the other hand used Pearson's product-moment correlation analysis of oil and gas companies in the Niger Delta region of Nigeria. They observed that environmental cost has satisfied relationship with the firm's profitability. Adediran and Alade (2021) [1] used multiple regression analysis of 14 randomly selected companies quoted on the Nigerian Stock Exchange 2010. Their findings show that environmental accounting has a positive relationship with net profit margin, dividend per share and a negative relationship with return on capital employed and earnings per share.

**Methodology**

The study's population consists of all publicly quoted Industrial Goods Sector on the Nigerian Stock Exchange. From 2010 to 2021, a sample size of ten (22) listed manufacturing businesses on the Nigerian Stock Exchange was purposefully selected. The decision of the selected firms is based on the fact that they are manufacturing companies that are quoted under Industrial Goods Sector. This indicates that the researcher will be covering all the firms under quoted Industrial Goods Sector. It is thought that their actions have a greater social impact, as seen by their financial accounts. As a result, the findings from the sampled businesses can be applied to the entire population. Environmental accountability was measured operationally by environmental spending. On the other hand, net profit was calculated by dividing net profit by total asset. The sustainability reporting template of the Nigerian Code of Corporate Governance by FRCN (2018) supported by SEC informed the choice of these measures. The principle of "apply and explain," also known as "principle based," guiding IFRS and the sustainability reporting template of the Nigerian Code of Corporate Governance by FRCN (2018) was employed. The regression model used by the researcher is a Fixed Effects Model, a Random Effects Model, and a Pooled Ordinary Least Square (OLS) model with panel data. The researcher used the Hausman and Wald tests to choose the best appropriate regression model with the maximum explanatory power that is better suited to the data set used in the study, which is a balanced panel. Ex-post factor design was used by the researcher. It is employed in retrospect when the researcher is looking for potential and reasonable linkages and impacts of changes in the independent variables on the dependent variable

**Model Specification**

With respect to the study variables, the following representations or denotations were constructed. Environmental accountability is one for the predictive variable (EnA). Return on Assets is one for the criteria variable (ROA). The researcher began by stating the functional relationship between the explanatory and response variable, which was as follows:

$$ROA=f(EnA,) \tag{1}$$

Because it lacks an error term and a constant, the given model is incomplete. To circumvent this, the researcher uses a regression model to rewrite the aforementioned equations

in econometric terms.

The regression model is thus stated as:  $Y_{it} = \alpha_0 + \beta_1 X_{it} + \mu_{it}$ . Where:  $y_{it}$  is the criterion variable,  $\alpha$  is Constant term for the criterion variable and  $\mu$  the random disturbance term.  $X_{it}$  are the predictor variables with  $\beta$  as the regression coefficients for the independent variables.

This study operationalizes the variables as follows in order to improve the model based on the nature of the data:

$$ROA_{it} = \alpha_0 + \beta_1 SoA_{it} + \mu_{it} \tag{2}$$

**Apriori Expectation**

The apriori expectations for this study are projected as follows:  $\beta_1 > 0$  (i.e. in each of the models), which means that:  $\beta_1 > 0$ : implies that environmental accountability is estimated to have a positive effect on ROA.

**Decision Rule:** Reject the null hypothesis if the P-value is less than 0.05. Consequently the alternative hypothesis becomes acceptable. EView 10.0 was used for the data analysis.

**Results and Discussions**

The presentation of data, analysis, and discussion of conclusions are all addressed in this chapter. The study looked into the effect of environmental accounting on the return on assets of publicly traded manufacturing companies in Nigeria, as previously stated.

**Data Analysis**

**Unit Root Test for Stationary Using Augmented Dickey Fuller**

The presentation of data, analysis, and discussion of conclusions are all addressed here. The study looked into the environmental accounting on the return on assets of publicly traded manufacturing companies in Nigeria, as previously stated.

**Table 1:** Unit Root Test Results Presentation

Variables	P-Value	Unit Root At	ADF Result	Decision	Remarks
ROA	0.0000	Level form	-8.11056	Reject	Stationary
EnA	0.0000	Level form	-53.0911	Reject	Stationary

Under this test, the null hypothesis is that the series has a unit root. From the table 1 above, for ROA, since the P-value of 0.0000 with ADF result of -8.11056 is less than 0.05, the null hypothesis is rejected. Meaning that ROA is stationary at level form.

For EnA, since the P-value of 0.0000 with ADF result of -53.0911 is less than 0.05, the null hypothesis is rejected. Meaning that EnA is stationary at level form.

**Table 2:** Descriptive Statistics Result

	ROA	ENA
Mean	6.532658	2369618.
Median	5.900000	229141.0
Maximum	20.29000	20691448
Minimum	0.390000	0.000000
Std. Dev.	4.663992	5293062.
Skewness	0.874641	2.450758
Kurtosis	3.386030	7.467175
Jarque-Bera	10.56297	144.7692
Probability	0.005085	0.000000
Sum	516.0800	1.87E+08
Sum Sq. Dev.	1696.720	2.19E+15
Observations	79	79

**Descriptive Analysis and Preliminary Tests**

For the measures of central tendency, in table 2. ROA has a mean of 6.532658, median of 5.900000, standard deviation of 4.663992, skewness index of 0.874641. EnA shows a mean of 2369618, a median of 229141.0, and standard deviation of 5293062, for the measures of normality, kurtosis measures the peakness and flatness of the distribution of the series. In the table 2 below, ROA has a Positive Kurtosis of 3.386. It is Leptokurtic. EnA has a kurtosis of 7.467175. Skewness measures the asymmetry of the series. Normal skewness has a 0 skew which its distribution is symmetric around its mean. Therefore in table 2, ROA has a positive skewness (0.8748). This mirrors a normal distribution. EnA has a skewness of 2.450758. Jarque Bera test measures the difference between the

skewness and kurtosis of the series with those of the normal distribution. The null hypothesis of Jarque Bera test states that the distribution is normal. ROA has a Jarque Bera of 10.56297 and p-value of 0.005085. This implies that the null hypothesis will be rejected. EnA shows a Jarque Bera of 144.7692 and p-value of 0.000000. The null hypothesis will also be rejected. The null hypothesis of Jarque Bera will be rejected since p-value is less than 0.05.

**Test of Hypothesis**

**H01:** Environmental accounting does not have any significant effect on return on asset of quoted manufacturing firms in Nigeria.

The Wald test conducted on the outcome of the Hausman test, revealed that Pooled OLS is a better model.

**Table 3:** Pooled OLS Model

Dependent Variable: ROA				
Method: Panel Least Squares				
Date: 07/20/21 Time: 14:47				
Sample (adjusted): 2013 2019				
Periods included: 7				
Cross-sections included: 10				
Total panel (unbalanced) observations: 68				
ROA= C(1) + C(2)*D2+ C(3)*D3 + C(4)*D4 + C(5)*D5 + C(6)*D6 + C(7)*D7 + C(8)*D8 + C(9)*D9 + C(10)*D10 + C(11)*ENA				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	9.569938	1.875932	5.101430	0.0000
C(2)	-9.826730	7.346887	-1.337536	0.1866
C(3)	-6.471822	2.193641	-2.950265	0.0047
C(4)	-7.308061	2.736958	-2.670140	0.0099
C(5)	-4.600712	2.276569	-2.020898	0.0482
C(6)	-4.537174	2.281446	-1.988728	0.0517
C(7)	-2.516916	2.276790	-1.105467	0.2738
C(8)	-5.081465	2.276746	-2.231898	0.0297
C(9)	-6.464334	2.128421	-3.037149	0.0036
C(10)	-3.997829	2.222679	-1.798653	0.0776
C(11)	4.20E-07	4.41E-07	0.952480	0.3450
R-squared	0.409826	Mean dependent var		5.886912
Adjusted R-squared	0.281061	S.D. dependent var		4.023870
S.E. of regression	3.411850	Akaike info criterion		5.462565
Sum squared resid	640.2396	Schwarz criterion		5.886882
Log likelihood	-172.7272	Hannan-Quinn criter.		5.630692
F-statistic	3.182743	Durbin-Watson stat		1.309402
Prob(F-statistic)	0.001668			
ROA= C(1) + C(2)*D2+ C(3)*D3 + C(4)*D4 + C(5)*D5 + C(6)*D6 + C(7)*D7 + C(8)*D8 + C(9)*D9 + C(10)*D10 + + C(11)*ENA				

EnA has a coefficient of  $4.2 \times 10^7$  and a p-value of 0.3450. This means that EnA does not have a significant effect on the ROA since the p-value is greater than the 0.05.

The R-Square value which determines the fitness of the model is 0.409826 (40.9%). This implies that the independent variable has 40.9% effect on the dependent variable.

**Conclusion and recommendation**

The study's population consists of all publicly quoted Industrial Goods Sector on the Nigerian Stock Exchange. From 2010 to 2021, a sample size of ten (22) listed manufacturing businesses on the Nigerian Stock Exchange was purposefully selected. With respect to the study variables, the following representations or denotations were constructed. Environmental accountability is one for the predictive variable (EnA). Return on Assets is one for the criteria variable (ROA). Under this test, the null hypothesis is that the series has a unit root. From the table 1 above, for

ROA, since the P-value of 0.0000 with ADF result of -8.11056 is less than 0.05, the null hypothesis is rejected. Meaning that ROA is stationary at level form, For the measures of central tendency, in table 2. ROA has a mean of 6.532658, median of 5.900000, standard deviation of 4.663992, skewness index of 0.874641. EnA shows a mean of 2369618, a median of 229141.0, and standard deviation of 5293062, for the measures of normality, kurtosis measures the peakness and flatness of the distribution of the series. In the table 2 below, ROA has a Positive Kurtosis of 3.386 This means that EnA does not have a significant effect on the ROA since the p-value is greater than the 0.05.

**Recommendation**

Environmental accounting does not have significant effect on return in asset which means other factors are more responsible for decline in the ROA of quoted Industrial Goods Sector in Nigeria sound management techniques should be put in place to manage those factors that affect

profitability.

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