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THE IMPACT OF ENVIRONMENTAL COST ACCOUNTING ON PROFITABILITY OF CONSUMER GOODS COMPANIES IN NIGERIA

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Abstract
The environment provides a platform for every business enterprise to strive. Therefore, it is imperative that there should be accountability on the use of environment especially in financial terms. The impact of such financial accountability on the financial performance of enterprises is also of great concern. Hence, the study was aimed at assessing the impact of environmental cost accounting on the profitability of consumer goods companies in Nigeria. Two research questions were raised and answered while two hypotheses were tested. The study covered a period of ten years (2013-2022). The design of the study was ex-post fact research design. Sixteen consumer goods companies whose annual reports were published participated in the study. Annual reports were used as instrument for data collection. Pearson correlation and panel least square regression analysis were used to analyze the study. The findings of the study revealed that environmental cost had a positive but weak impact on returns on equity and a negative impact on returns on assets of consumer goods companies in Nigeria.
Keywords. Environmental cost accounting, return on assets, return on equity, consumer goods companies.

Introduction

Education is the key to any sustainable development in a society. Business education, as a branch of education, is a programme that equips recipients with requisite knowledge, attitude, values and skills to enable them secure and succeed in employment as office workers, school teachers or entrepreneurs. Uchenu, Okeke-Okonkwo and Ifi (2019) defined business education as an educational programme that prepares students for entry into and advancement in jobs within business as well as handle their own business affairs and function intelligently as consumers and citizens in a business economy. It provides the necessary knowledge and skills needed to establish and manage business enterprises effectively.

Business enterprises play a key role in the development of a nation because they are pivotal to the sustenance of any society which in turn provides a conducive environment for the enterprise to situate their factories and carry out their business activities. The primary objective of a business enterprise is profit making (Ayanda, 2015). In a bid to make profits, the enterprises tend to forget that their activities, sometimes, have some negative impacts on the environment leading to the popular belief that engaging in business means prospering at the expense of the society. However, the impact of business activities on the environment cannot be neglected because doing so would lead to the collapse of the environment thereby making it impossible for the business and other operations in the environment to thrive. Hence, there is need for businesses to become accountable for the use of the

environment in line with the current trend. This led to the emergence of environmental accounting and subsequently, environmental cost accounting.

Environmental cost accounting as a branch of environmental accounting deals with identification and allocation of environment costs to material flows or other physical aspects of a firms operation (Okoroafor, 2016). Amin, Magara and Momanyi (2015) depicted environmental cost accounting as a systematic approach that seeks to quantitatively evaluate the costs and benefits accruing to an enterprise as a direct result of its eco-friendly initiatives, using either monetary or physical metrics. Environmental cost accounting is measured by environmental cost.

. Environmental costs refer to expenditures incurred by corporate organizations to eradicate, minimize, or recuperate negative consequences of the entity's activities on the environment (Ezeagba, John-Akamelu & Umeoduagu, 2017). These environmental costs borne by companies could increase the operating cost of running businesses. However, with proper identification, management and control of environmental costs, the company, in the long run, will begin to enjoy the benefits in various forms such as reduction in operating costs, better company image and goodwill, higher sales turnover, higher profits and increase in market share among others. Hence, environmental cost accounting could be regarded as a type of panacea to the increasing negative environmental impacts of manufacturing companies. Therefore, environmental costs can have either a positive impact or negative impact on profitability. Shehu (2014); Falope, Offor and Ofurum (2019) and Kaoje, Idris, Danrimi, Kurfi and Abubakar (2020) found out that environmental expenditure (cost) had significant effect on profitability (ROA and ROE) but there are no studies carried out on consumer goods companies yet to determine the impact of environmental cost on profitability.

The following formed the research questions:

1. What is the impact of environmental costs on return on equity in consumer goods companies in Nigeria?
2. What is the impact of environmental costs on return on assets in consumer goods companies in Nigeria?

The hypotheses tested are below:

1. Environmental costs do not have significant impact on return on equity of consumer goods companies in Nigeria.
2. Environmental costs do not have significant impact on return on assets of consumer goods companies in Nigeria.

Literature Review

Environmental Cost Accounting

Environmental cost accounting according to Effiok, Bassey and Okon (2013) is a process that entails the identification, quantification, and allocation of environmental expenses, as well as the seamless integration of these costs into business operations and transparent communication of such information to relevant stakeholders. Environmental cost accounting takes on the role of consolidating and presenting accounting information, including the practice of natural resource accounting, at the organizational level for the purpose of natural resource management (Oluwamayowa, 2020).

Environmental cost accounting majorly aims at achieving new goals by using major indicators in measuring and evaluating potential or actual environmental impacts of projects and organizations to help in accurate assessment of costs and benefits of environmental preservation

measures of companies ((Asuquo, 2012; Egbunike & Oraka, 2016). Rakos and Antohe (2014) asserted that the objective of the environmental cost accounting is to allow the economic entities, local and governmental collectivities, to have a correct assessment of the impact exerted by the productive activity of an economic entity on the environment. Environmental cost accounting enables proper allocation or tracing of costs to the activity or production process that incurs it. Every company strives to reduce its environmental costs and this can only be achieved with proper identification and allocation of environmental costs. Therefore, environmental cost accounting is foundational and should precede all efforts to lower environmental costs.

Environmental Costs

Jing and Song-Qing (2011) defines environmental costs as those costs associated with the implementation of environmental responsibility, regulatory compliance, environmental protection law, negative environmental impact prevention activities and measures to achieve environmental goals. They include the costs of waste reduction, waste recycling, pollution treatment and management, environmental protection, environmental and social compensation.

Nwaiwu and Oluka (2018) saw environmental costs as costs incurred by companies in order to protect the environment, prevent environmental problems and minimize damages to the environment. They include costs incurred in compliance with or prevention of breach of environmental laws, regulations and company policies.

Profitability

Kwaltommai, Enemali, Duna and Ahmed (2019) averred that profitability is the ability to make profit from all business activities of an organization, firm, company or enterprise. Onipe (2018) posited that firm profitability is the extent to which financial objectives of the firm are being achieved. This involves various financial metrics that are utilized to assess or measure the outcomes of a firm's policies and operations in monetary terms (Ezeagba, John-Akamelu & Umeoduagu, 2017). Profitability is used to measure a company's financial performance as it shows how efficiently the management can make profit by using all the resources available. There are some indices for measuring profitability which include among others: return on assets and returns to equity.

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Returns on equity (ROE)

Return on Equity (ROE) is a financial metric that measures a company's profitability relative to the total amount of shareholder equity invested in the company. Kaoje, Idris, Danrimi, Kurfi and Abubakar (2020) averred that return on equity ratio indicates the margin available for the shareholders after satisfying all other obligation and taxes. It indicates the percentage of profit that shareholders earn on their investment in the company (Almira &Wiagustini, 2020). A company with a high ROE is likely to be proficient at generating internal cash flow. As a result, a higher ROE

generally signifies better profitability. To calculate ROE, the net income of a company is divided by the total shareholder equity, and then multiplied by 100 to get a percentage.

Returns on equity = Profit before interest and tax
Shareholders fund

Shareholder equity is the difference between a company's assets and liabilities, and represents the amount of money that would be returned to shareholders if all assets were sold and liabilities paid off. A higher ROE is generally seen as a positive sign, as it indicates that the company is generating a higher return on its equity. This could mean that the company is profitable, efficient, and able to generate internal cash flow. However, a high ROE should also be evaluated in the context of the industry and the company's peers. It is important to note that ROE can be affected by several factors, such as the amount of debt a company has, the industry it operates in, and the economic conditions. For example, a company with a high debt-to-equity ratio may have a higher ROE, but this could also mean that it is taking on more risk.

Return on assets (ROA)

ROA shows profitability on assets of a firm after meeting all expenses and taxes. It measures the profit of the firm after tax for each amount of money invested in its asset. It is an indicator of the managerial performance of a company. Nnamani, Onyekwelu and Ugwu (2017) opine that ROA indicates how profitable a firm is relative to its total asset and how well management is employing the firm's total asset to make profit. Higher ROA ratio means better managerial performance. ROA can be increased by increasing profit margin or asset turnover. ROA = Net Profit before Tax/ Total Assets.

Methods

The study adopted an expo-facto research design. The population of the study was 21 consumer goods companies listed in the Nigeria Stock Exchange (NSE) as at January, 2023. The sample for the study was 16 consumer goods companies. The study covered a period of ten years (2013-2022). All the consumer goods companies whose annual report were published online for the period of study made up the sample. The instrument for data collection was annual reports of the companies under study hence, it was deemed reliable. Panel least square regression and Pearson correlation were used for analysis.

In this study, a positive correlation indicates that as environmental costs increase, the profitability index tends to increase as well, while a negative correlation would suggest the opposite. The p-value is used to determine the statistical significance of the correlation coefficient (Sedgwick, 2012) as it shows whether the observed correlation is statistically significant or if it could have occurred by random chance. When the correlation coefficient (r) is: ±0.01 to 0.20 = Very weak, ±0.21 to 0.40 = Weak, ±0.41 to 0.60 = Moderate, ±0.61 to 0.80 = Strong and ±0.81 to 1.00 = Very strong. Note that positive (+) implies that an increase in one variable leads to increase in the other variable, while (-) implies that an increase in one variable leads to a decrease in the other variable; zero (0) implies that there is no relationship; unit (1) implies a perfect relationship.

Results

Research Question 1. What is the impact of environmental costs on return on equity in consumer goods companies in Nigeria?

Table 1.
Correlation of the impact of environmental cost on returns on equity

Correlation (*r*)	
Variable	Return On Equity
Environmental Cost	0.1903*
p-value	0.0160

Source: Stata 13 Analysis Output (2023)

Table 1 shows the correlation of the impact of environmental cost on return on equity. The correlation coefficient 0.1903 suggests a very weak positive relationship between environmental costs and return on equity. This means that, on the average, as environmental costs increase, there is a tendency for return on equity to increase slightly.

Research Question 2. What is the impact of environmental costs on return on asset in consumer goods companies in Nigeria?

Table 2.
Correlation of the impact of environmental cost on returns on assets

Variable	**Returns On Assets**
Environmental Cost	-0.0163
p-value	0.8383

Source: Stata 13 Analysis Output (2023)

Table 2 shows the correlation of the impact of environmental cost on return on assets. The correlation coefficient is negative (-0.0163), suggesting that environmental costs has a very weak negative effect on return on assets. This means that, increase in environmental cost leads to slight decrease on return on assets.

Hypothesis 1. Environmental costs do not have significant impact on returns on equity of consumer goods companies in Nigeria.

Table 3.
Regression Analysis of the Impact of EC on ROE

Sources	**SS**	**Df**	**MS**	**F**	**Sig.**	**Decision**
Model	16.79	3	5.598	43.19	0.000	Significant
Residual	20.22	156	.1296			
Total	37.01	159	.233			
	Coefficient	**SE**	**Beta**	**T**	**Sig.**	**Decision**
EC	.226	.077	.2035	2.92	0.004	Significant
FS	.069	.037	.130	1.85	0.066	Not Significant
Lev	-.068	.006	-.656	-10.91	0.000	Significant
Constant	-.343	.266		-1.28	0.201	Not Significant

Source: Stata 13 Analysis Output (2023)

Table 3 reveals the outcome of the regression analysis conducted to test the null hypothesis that environmental costs do not have a significant impact on the return on equity (ROE) of consumer goods companies in Nigeria. The F-statistic tests the overall significance of the regression model. In this analysis, the F-statistic is 43.19, and the associated probability (p) is 0.0000< 0.05, which indicates that the overall regression model is statistically significant. The R-squared value is 0.454, representing the proportion of the variance in return on equity that is explained by the independent variables in the model. Thus, the model explains approximately 45.37% of the variance in ROE.

The coefficient for the environmental costs variable (EC) is 0.2257499. This coefficient represents the estimated change in return on equity for a one-unit change in environmental costs, holding other variables constant. Hence, an increase in EC by a margin will lead to an increase in ROE by 0.226. The p-value associated with the environmental costs variable is 0.004, which is less than 0.05 level of significance. This indicates that the coefficient for environmental costs is statistically significant at the 0.05 significance level.

Since the *p*-value for EC is less than 0.05, do not accept null hypothesis and the researcher concludes that environmental costs have a positive and significant effect on return on equity of consumer goods companies in Nigeria (β = .226, *p*-value = 0.004).As for the control variables, while firm size has a non-significant positive effect on ROE, firm leverage has a significant negative effect on ROE at 5% level of significance.

Hypothesis 2. Environmental costs do not have significant effect on returns on assets of consumer goods companies in Nigeria.

Table 4
Regression Analysis of the Impact of EC on ROA

Sources	**SS**	**Df**	**MS**	**F**	**Sig.**	**Decision**
Model	1.531	3	.5103	1.79	0.1514	Not Significant
Residual	44.477	156	.285			
Total	46.007	159	.289			
	Coefficient	**SE**	**Beta**	**T**	**Sig.**	**Decision**
EC	.118	.115	.0365	1.03	0.306	Not Significant
FS	-.117	.055	.2186	-2.14	0.034	Significant
Lev	-.005	.009	-.4013	-0.58	0.561	Not Significant
Constant	.988	.395		2.50	0.014	Significant

Source: Stata 13 Analysis Output (2023)

Table 4 shows the output of the regression analysis which tested the hypothesis that environmental costs (EC) do not have a significant effect on the return on assets (ROA) of consumer goods companies in Nigeria. The F-statistic measures the overall significance of the regression model. The F-statistic is 1.79, and the probability (p) is 0.151 which is greater than the significance level of 0.05. This suggests that the regression model as a whole is not statistically significant. In other words, there is not enough evidence to conclude that the independent variable (environmental costs) has a significant effect on the dependent variable (ROA) in your model.

The R-squared value (0.033) represents the proportion of the variance in the dependent variable (ROA) that is explained by the independent variables in your model. The model explains

approximately 3.33% of the variance in ROA. This is a relatively low R-squared value, indicating that the independent variable (environmental costs) does not explain much of the variation in ROA.

The coefficient for environmental costs (EC) is 0.118. This coefficient represents the estimated change in the dependent variable (ROA) for a one-unit change in the independent variable (EC), holding all other variables constant. Hence, an increase in EC by a margin will lead to an increase in ROA by 0.118. The p-value (P>|t|) associated with the coefficient for EC is 0.306, which is greater than 0.05. This indicates that the coefficient for environmental costs is not statistically significant at the 0.05 significance level. In other words, there is no strong evidence to suggest that environmental costs have a significant impact on ROA in your model.

Since the *p*-value for EC is greater than 0.05, the null hypothesis was accepted and the researcher concludes that environmental costs have a positive but has non-significant effect on return on asset of consumer goods companies in Nigeria (β = .1180132, *p*-value = 0.306).As for the control variables, while firm size has a significant negative effect on ROA, firm leverage has a non significant negative effect on ROA at 5% level of significance.

Discussion of Findings

The findings of the study revealed that EC has a positive and significant effect on ROE as opposed to the finding of Norhasmimah (2016) who found out EC has a negative significant impact on ROE. The significant positive relationship between environmental costs and return on equity (ROE) for consumer goods companies in Nigeria reflects the potential for sustainable practices to create value for shareholders. Investments in sustainability not only bolster a company's financial performance but also demonstrate responsible corporate governance, which can attract investors seeking ethically sound and profitable opportunities. The resultant higher ROE signifies that these companies effectively utilize shareholders' equity to generate profits while aligning with environmental goals.

The findings of the study revealed that EC has a negative impact on ROA of consumer goods manufacturing companies in Nigeria. It also showed a non-significant effect on ROA. This means that, increase in environmental cost leads to slight decrease on return on assets. The negative but non-significant effect of environmental costs on return on assets (ROA) underscores how sustainable practices can enhance the overall efficiency of consumer goods companies in Nigeria. The finding of the study differs from Falope, Offor and Ofurum (2019) who found out that EC has positive effect on ROA. By incorporating eco-friendly processes and resource conservation measures, these companies can maximize the productivity of their assets while minimizing waste and environmental impacts. Consequently, their ROA will improve, reflecting the effectiveness of their asset management in generating profits and supporting sustainable operations.

Recommendations

1. Consumer goods companies should establish robust environmental monitoring and reporting systems in order to attain a positive effect of environmental costs on ROA. Regularly tracking key sustainability metrics, such as energy consumption, waste generation, and carbon emissions, allows companies to identify areas for improvement and make data-driven decisions.
2. Consumer goods companies in Nigeria should optimize their supply chain operations to reduce waste, implement energy-efficient technologies, and explore partnerships for

recycling and waste reduction. Such efforts can lead to higher net profits, making it advisable to allocate resources to environmentally responsible practices.

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