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Effect of Environmental Costs on Firm Performance

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ABSTRACT

The paramount importance in most management settings for environmental cost and its management in manufacturing/oil and gas companies has become the concern and focus of most companies. However, the sample of companies used for the study are Nigerian Breweries Plc., Dangote Cement Plc. Conoil Nigeria Plc., MRS Oil Nigeria Plc., and Total Nigeria Plc. The data used in this study were extracted from the financial annual reports of the selected corporate management strategies. This study carried out an empirical analysis of the effect of environmental costs on firm performance of selected companies in Nigeria covering the period 2010-2019. The population of this study is a constitution of all manufacturing/oil and gas companies enlisted in the Nigeria Stock Exchange companies. In this study, environmental cost was captured with health and safety expenditures, staff training and litigation claims/fines, while performance was captured with profit for the year. The panel data regression analysis was employed as a method of data analysis. The major findings of the study were that health and safety costs have no significant impact on profit for the year of selected companies in Nigeria, staff training contributed positively and have significant impact on profit for the year of selected manufacturing oil and gas companies in Nigeria and litigation claim/fines contributed negatively and have no significant impact on profit for the year of selected companies in Nigeria. The study, therefore, recommended that the management of these companies should be more strategic in engaging in such expenses and cost engagements and companies should however be more careful not to keep incurring litigations claims/ fines by conducting their activities with serenity and consideration.

Keywords: *Environmental Costs; Firm Performance; Nigeria*

1. Introduction

Environmental deterioration has been a huge problem facing many countries, Nigeria inclusive. Manufacturing activities, among others, have contributed to environmental deterioration in many countries, emission of fossil fuels in the atmosphere, oil spillage in the sea and on the land, indiscriminate disposal of waste products and many more. These have made the atmosphere, land and sea very difficult for animal's and man's convenience. These problems have made many governments to involve environmental experts to address the menace. The paramount importance of environmental costs and their management in manufacturing companies and others have become the concern and focus of most corporate management strategies. It has become one of the foremost issues on the agenda of business earlier in the 1990s and the reasons for this were varied emanating from both within and outside of the firm and particularly at the global level, (Okoye and Ngwakwe, 2013). Protection of environment and the potential involvement of accountants are becoming a common subject of discussion among the accountants all over the world, (Pramanik, Shil and Das, 2017).

The increase in environmental awareness is redirecting the attention of firms towards environmental costs, (Bala and Yusuf, 2003).
Environmental expenditures in terms of effective organizational cost reduction are a highly viable approach toward managerial justification of environmental management system expenditures, (Acti, Lyndon, & Bingilar, 2013).
The effect of these environmental costs, such as health, safety and environment, staff training and litigation claims/fines on corporate performance represented by profit for the year of manufacturing /oil and gas companies covering the period 2010-2019 are examined in this study.

Statement of the Problem

The environmental hazards, menace, pollution and degradation caused by the activities of manufacturing, construction, oil and gas, et cetera, companies are causing a global concern, because, these activities go down to lower the life span of people and affect the economy adversely. Oil Spilled in the water, kill aquatic animals, those spilled on the land, damage the soil thereby causing harm to farm land, emission of fossil fuels which trap heat in atmosphere making them the primary contributors to global warming and climate change contributed by many companies in Nigeria. This problem prompted the researcher to look into the financial statement of some selected manufacture/oil and gas companies to know the precautionary measures taken by these selected companies to correct this menace, also to see how they have tried to compensate those affected by their negative impact activities and their effect on their performance.

Objectives of the Study

The broad objective of this study is to examine the effect of environmental costs on corporate performance of selected manufacturing/oil and gas companies in Nigeria. The specific objectives are to:

1. Ascertain the effect of health and safety costs on profit for the year of selected manufacturing/oil and gas companies in Nigeria.
2. Determine the effect of staff training on profit for the year of selected manufacturing/oil and gas companies in Nigeria.
3. Appraise the effect of litigation claims/fines on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

Research Questions

In this study, the following research questions are as follows:

1. What is the extent of health and safety costs on profit for the year of selected manufacturing/ oil and gas companies in Nigeria?
2. How do staff training costs affect profit for the year of selected manufacturing/oil and gas companies in Nigeria?
3. What is the effect of litigation claims/fines on profit for the year of selected manufacturing/oil and gas companies in Nigeria?

Research Hypotheses

The following null hypotheses were tested in the course of the study:

1. Health and safety costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.
2. Staff training costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

3. Litigation claims/fines have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

2. Review of Related Literature

2.1 Conceptual Review

Environmental Costs

There is no standard definition as regards environmental costs as this is left to the discretion of the companies to decide which expenditures or costs should be included under the environmental expenses or costs. Measuring environmental performance or setting targets is a critical component for organizations to become more productive, more profitable, and more sustainable (Freedman, 1983).

Environmental costs consist of environmental measures and environmental losses. They include cleanup costs, costs of recycling materials, conserving energy, closure costs, et cetera. These costs are incurred in preventing, reducing or repairing damage to the environment and conserving resources. However, environmental losses are costs, which bring no benefits to the business, such as, fines, compensation, waste management and disposal losses relating to assets which have to be scrapped or abandoned because of their damage to the environment, (Wright and Noe, 2006).

Health and Safety Costs

One of the issues being addressed as part of the company's environmental costs is health and safety. Health and safety as a function, focuses on securing and promoting safety and health of the persons working for the company including both physical and mental health (Holt, 2012).

Ignoring health and safety can be expensive and dangerous, resulting effects being occupational accidents, causing money for the companies in which they happen, leading to financial losses for the employees to whom they happened and causing society money, example, health care and loss of working capacity.

One of the environmental costs in the course of every company operation is the possibility of health hazard. George (2006) asserted that health expenditures are the expenditures tailored towards health curative and preventive measures on the employees and the inhabitants of the host communities of the firm. According to him, the preventive costs are the expenses tailored towards arming the beneficiaries against the possibility of ill health related to environmental hazards while the curative expenses are the one related to treatment of actual health hazards caused by the firm environmental practices. Dennis (2009) on the other hand posited that companies through the insurance companies pay premium in advance for the registered employees of the firm.

Traditionally, the information collected regarding occupational accidents have been on, frequency, types, location, employee groups, length of sick-leaves et cetera. This information has been put in relation with number of employees, number of hours worked, number of sites etc. (Holt 2012). However, when seeing health and safety issues and occupational accidents in an accounting context, the costs of these accidents, the value that the company loses in the course of occupational accidents and the value that is created becomes a concern though prevention initiatives becomes of interest.

Community Development/Staff Training

Community is defined as group of people sharing common purpose, who are interdependent for fulfillment of certain needs, who live in close proximity and interact on a regular basis (Maimunah, 2009). Within a community, there exist shared blames for all members of the group and responsibility taken from these expectations. Interestingly, each community has leaders who are responsible for the success of their community event depending on the need of the community. Puke (2008) defined development as a multidimensional process involving the reorganization and reorientation of the entire economic and social system. It involves improvement in income and output, changes in institutional, social and administrative structures as well as in popular attitude, customs and beliefs. The United Nations in Omale and Ebiloma (2005) defined development as a process by which the effort of the people is united with those of government or other organizations to improve the economic, social and cultural condition of communities to integrate these communities into the life of the nation and to enable them to contribute fully to the nations' progress.

However, in the context of this study, community development refers to the extension of existing companies' corporate social responsibility targeted at contributing to the host community. It involves giving away in cash or kind to social causes, especially to the favor of the host community. There has been a growing demand for companies to offer community development initiatives to the communities within which they are carrying out their operations.

The failure of some government of developing countries to provide adequate basic social infrastructures to their citizenry has put corporations especially the multinational companies operating in these countries under pressure, in particular, oil exploration in developing countries, where the main source of livelihood for the residents are from fishing and farming, has resulted into high unemployment of the residents in the community. Oil activities have polluted the water and the fertile land destroyed by oil spills and gas flares. It has been argued that business should take account of the social, ethical, and environmental perceptions of their operations.
For businesses to thrive, they must conduct their operations in such a way as to add value, rather than detracting from the economic and social infrastructures of their host communities. Firms must take an active part in the social development of such areas as well as the residents.

Litigation Claims/Fines
Lots of systems are occupied with irregularities, some companies compromise on defaulting environmental efficiency without due compensations. In response to this, the government through some of its instituted agencies impose an unavoidable fine/penalties on the companies that default. In other words, in the context of environmental costs, Helen (2010) submitted that fines are monetary and compulsory levies imposed on firms for compromising some of their compensatory standards on their employees, stakeholders or prospective beneficiaries in the host communities. She further asserted that the more a firm is fined, the uglier the image of the firm in the perception of prospective investors and host community.

Ihunanya (2016) recognized fine in the context of environmental cost as a mandatory payment firms are charged for operating below optimal standard against their employees and other stakeholders. He agreed that fine be paid directly to the victim so as to compensate for a default cost.

Firm Financial Performance (Profit for the Year)
Financial Performance as a way of definition is a subjective measure of how well a firm can use assets from its primary mode of business to generate revenues. It is a process of measuring the results of a firm's policies and operations in monetary form. The variable used to measure performance in this study is profit for the year. Profit is an excess of revenues over associated expenses for an activity over a period of time.

2.2 Theoretical Review

This study is anchored on stakeholders' theory.

Stakeholders Theory
The basic proposition of the stakeholder's theory is that the firm's success is dependent upon the successful management of all the relationships that a firm has with its stakeholders, a term originally introduced by Stanford research institute to refer to those groups without whose support the organization would cease to exist (Freeman 1983). Freeman's stakeholders' theory asserts that, managers must satisfy a variety of constituents, examples are, employees, customers, suppliers, local community and so on who can influence the firm's outcomes. According to this view, it is not sufficient for managers to focus exclusively on the needs of stakeholders, or the owners of the business. This implies that it can be beneficial for the firm to engage in certain environmental activities that non-financial stakeholders perceive important, because without this, these groups might withdraw their support from the business. In developing the stakeholder theory, Freeman, (1983) incorporated the stakeholders' concept into categories: business planning and policy model, and a corporate social responsibility model of stakeholder management. In the first model, the stakeholder analysis focuses on developing and evaluating the approval of corporate strategy decisions by groups whose support is required for the firms' continued existence. The stakeholders identified in the model include the owners, customers, public groups and suppliers. Although these groups are not adversaries in nature, their possibly conflicting behaviour is considered a constant on the strategy developed by management to best match their firms' resources with the environment (Degan and Gordon, 1966).

2.3 Empirical Literature

Some of the related past studies in this subject matter were reviewed in this section.
Ngozi and Ike (2019) examined the effect of environmental and social costs on performance of manufacturing companies in Nigeria. The objectives of that study were to examine the relationship between environmental and social costs and performance of manufacturing companies in Nigeria. The data for the study were collected from annual reports and accounts of fourteen (14) randomly selected manufacturing companies in Nigeria. The data were analyzed using multiple regression models. The key findings of the study showed that there was significant negative relationship between environmental and social costs and return on capital employed and earnings per share and a significant positive relationship between environmental and social costs and net profit margin and dividend per share. Based on that, it was recommended that government should give tax credit to firms that comply with its environmental laws in order to reduce their environmental costs and that environmental reporting should be made compulsory in Nigeria so as to improve the performance of organizations and the nation as a whole.

Agbo (2017) carried out a study on the effect of environmental cost on organizational performance of Nigerian brewery Plc. Data used for this study were obtained from the annual report of Nigerian brewery Plc. on donations, medical expenses and on the return on asset within a period of five years, 2011 to 2015. Hypotheses were formulated and multiple regressions were used for the analysis. It was found that both donation and medical expenses have a negative relationship with return on assets. Trainings, recruitment and canteen expenses and return on assets have a positive relationship on Nigerian brewery Plc.

Adediran and Alade (2013) 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.

Agbasa (2016) examined the effects of environmental cost on firm performance of selected manufacturing and Oil and gas companies in Nigeria. This study was anchored on stakeholder theory with the aim to establish whether there is any significant relationship between environmental cost and performance of companies in Nigeria from 2010-2014. The data used were obtained from the annual report of the selected firms. The study used descriptive statistics, correlation and regression analysis. The regression result showed that a positive significant relationship existed among corporate social responsibility, employee health and safety cost, waste management and firm performance while community development cost had a negative and insignificant relationship with firm performance. The study, therefore, recommended that firms should invest more in the development of their host communities to boost their corporate image and maintain good relationship with the host communities.

Bewley and Li (2000) appealed to voluntary disclosure theory to examine the environmental disclosures of Canadian manufacturing firms. They used the Wiseman index to measure the 1993 annual report disclosures of 188 firms and industry membership to proxy for pollution propensity. They found that firms with a higher pollution propensity and greater media coverage of their environmental performance are more likely to disclose general environmental information, a result also, that was consistent with the socio-political theories.

Ahmed (2019) investigated the effect of environmental cost on the performance of oil and gas companies (upstream) in Nigeria. The study used panel data obtained from the National petroleum management investment services, the study period was from 2007 to 2016. The annual reports and accounts were the basic source for the data collection. Arising from the findings, the study concluded that the significance of environmental cost, that is, the model indicated three out of four environmental costs used as proxies had significant effect on the performance of listed oil and gas firms in Nigeria. Based on the conclusions of the research, the study recommended that amount spent by oil and gas firms in Nigeria on environment remediation control cost should be increased and prevention control should be reduced to a very considerable level as this would go a long way in enhancing the performance of listed oil and gas companies in Nigeria. The amount spent on environmental laws and compliance and penalty should be increased as these would eventually translate into a better performance for the listed oil and gas firms in Nigeria.

Hassel, Nilsson and Nyquist (2005) using regression method, examined the effect of environmental cost information on the market value of listed companies in Sweden using a residual income valuation model. The results showed that environmental responsibility as disclosed by sampled companies had value relevance, since it was expected to affect the future earnings of the listed companies. Their findings have implications for companies that pollute the environment, their future solvency may be eroded with gradual depletion in earnings.

Milne, Owen & Tilt (2005) conducted a comparative study of the relevance of environmental cost report to stakeholders between Australia and New Zealand, and found out that they used annual reports as an important source in the assessment of environmental cost variable on companies. They found out that 82% of the community members made use of environmental cost disclosure in corporate reports of the companies.

Anna and Emelie, (2015) investigated whether corporate social responsibility engagement have a direct impact on financial performance in the form of stock returns, and found out that a top ranking did not have an effect on stock returns, whereas a bottom ranking had a negative impact. This negative impact according to the authors has been consistent over the years, and has increased over time, even though top-performers within the area of corporate social responsibility are not rewarded, companies are still punished for poor corporate social responsibility performance. Also, their results showed that the number of companies not engaging in corporate social responsibility at all have decreased.

Neungruthai and Mula (2012) carried a study towards a conceptual design for environmental and social cost identification and measurement system. The purpose of the paper was to identify an effective management accounting system using sustainability accounting concepts for environmental and social cost measurement to add shareholder value. The results of the study indicated that companies are intending to change to new management accounting practices while looking for ways to improve cost identification and measurement of environment and social impacts.

Nwaiwu and Oluka (2018) examined the effect of environmental cost disclosure and financial performance measures of quoted oil and gas companies in Nigeria. Time series data were collected from annual financial reporting and economic review of Central Bank of Nigeria. The econometric results reviewed adequate disclosure on environmental cost, compliance to corporate environmental regulations have positive significant effect on financial performance measures. Thus, the study recommended regulatory enforcement for adequate environmental cost disclosure and proper reporting. Management of oil and gas companies in Nigeria were advised to develop a well-articulated environmental costing system in order to guarantee a conflict free corporate atmosphere for improved corporate performance.

Shehu (2014) examined the effect of environmental expenditure on the performance of quoted Nigerian oil companies, within a period of twelve years (1999-2010) using selected firm financial statement of all quoted oil companies listed in the Nigerian Stock Exchange. The data was analyzed using multiple regression, employing return on assets.

Arong, Ezugwu and Egbere (2014), carried out a study on the effect of environmental cost management on the profitability of oil sector in Nigeria from 2004 to 2013. Data used were obtained from the Central Bank of Nigeria. Multiple regression analytical technique was employed. Result revealed that there existed a significant relationship between influence of environmental cost management and the profitability of oil sector in Nigeria. Also, it was discovered that there are established standards in Nigeria guiding environmental cost management in the oil and gas industries in Nigeria. It was concluded that the extent of environmental cost management in the oil sector is at its rudimentary stage. It was however recommended inter alia that there should be policy consistency on the improvement of external reporting in environmental cost data.

Dierkes (2013), in his works condemned the whole essence of placing monetary value above other human virtues in environmental issues.

Arong (2014) examined the effect of environmental cost management on the profitability of oil sector in Nigeria from 2004 to 2013. Data used were obtained from the Central Bank of Nigeria. Multiple regression analytical technique was employed. Result revealed that there existed a significant relationship between influence of environmental cost management and the profitability of oil sector in Nigeria. Also, it was discovered that there are established standards in Nigeria guiding environmental cost management in the oil and gas industries in Nigeria. It was concluded that the extent of environmental cost management in the oil sector is at its rudimentary stage. It was however recommended inter alia that, there should be policy consistency on the improvement of external reporting in environmental cost data.

Lawal, Florence and Willy (2016) carried out a study on the effect of identification of environmental cost on quality of disclosure on shipping lines. This study adopted both descriptive design and correlation analysis and the population of the study was the registered shipping lines in Nigeria. The sample of this study was restricted to the legal department, finance and account department, and technical and marine department of the shipping companies. This study made use of primary data. Data was collected through administering of questionnaires to the staff of the shipping lines in Nigeria. Simple regression model was used to establish the relationship between the dependent variable and the independent variable. The findings showed that identification of environmental cost influences quality of disclosure on shipping lines in Nigeria. Based on the findings of that study, it was recommended that companies should decide in their discretion which expenditure or cost should be included under the environmental expenses or costs.

Bassey, Effiok and Eton (2013), in their work, examined the impact of environmental cost and reporting on organizational performance of selected oil and gas companies in Niger Delta region of Nigeria and found that firms which are environmentally friendly would significantly publish environmental related information in their financial statements and other reports of the business.

Azar, Shahbazi, Abad and Moasavi (2014), in their work aimed at evaluating the relationship between provision of environmental costs information and improving management performance of companies of pharmaceutical industry in the Tehran stock exchange, concluded that a relationship existed between improving management performance and environmental costs information disclosure of the companies in Tehran stock exchange.

Lubomir and Dietrich (2009), carried out a research on the topic captioned "Does better environmental costs affect revenues, costs or both"? Evidence from transition economy. The work used unbalanced panel data of Czech firms from 1996-1998. The analytical results indicated that better environmental performance improves profitability by driving down costs more than it drives down revenue.

Mohammad, Sutrisno, Prihat and Rosidi (2013) also researched on effect of environmental costs and environmental information disclosure as mediation on company value. The researchers selected 59 companies in Indonesia, their major finding was that environmental accounting implementation had not been able to affect company value through environmental information disclosure.

Okezie (2017) evaluated the effect of indirect costs on corporate profitability of quoted companies in Nigeria. The indirect costs are measured by power and electricity, rent charges, and employees' salaries; while firm performance is measured by return on assets. The study used secondary data from the financial reports of the quoted companies. The study employed multiple regression analysis to test the hypothesized variables. It was discovered that power and electricity have significant impact on return on assets, while rent charges, and employees' salaries have insignificant impact on return on assets of quoted companies studied. The study recommended that quoted companies in Nigeria should look into their power and electricity costs with a view to applying innovative energy management solutions that are available today for reducing operational cost, and preventing device failure to improve profitability.

3. Methodology

This study adopted the *Ex post facto* research design. This is a quasi-experimental design examining how an independent variable affects a dependent variable. The design also creates a framework whereby the researcher has no direct control over the variables but estimates them as they are objectively appeared.
The area this research covered are the environmental cost variables encompassing health and safety costs, community development/staff training costs and litigation claims/fines and the performance proxy by profit for the year in selected firms in Nigeria, namely: Nigerian Breweries, Conoil Nigeria Plc., MRS Oil Nigeria Plc, Dangote Cement Nigeria Plc. and Total Nigeria Plc.
The population of this study comprises of the fifteen (15) top manufacturing companies and ten (10) oil & gas companies/sectors in Nigeria.

Five (5) major companies were objectively selected based on their greatest effect on environment in Nigeria and availability of environmental expenditures/costs. Companies that did not participate in environmentally costing activities or that had not kept data pertaining to such were excluded, therefore, the five companies used for the study are, Nigerian Breweries Plc., Conoil Nigeria Plc., MRS Oil Nigeria Plc., Dangote Plc. and Total Nigeria Plc. These comprised of selected manufacturing and oil and gas companies.
The data used in this study is extracted from the financial annual reports of the selected manufacturing and oil and gas companies in Nigeria, namely: Nigerian Breweries Plc., Conoil Nigeria Plc., MRS Oil Nigeria Plc., Dangote Cement

Nigeria Plc. and Total Nigeria Plc. from 2010-2019 being a period of ten (10) years but on cross-section estimation (50 years). Data from profit for the year, health and safety costs, staff training costs and litigation claims/fines were extracted.

Panel data regression analysis (longitudinal data) is employed in this study because of the estimation of two manufacturing companies and three oil and gas companies, the presence of both cross sectional and time series component. Panel data makes it possible to get a handle on the time ordering of variables and to monitor the individual trends over time. In additional, complex and difficult data can be estimated using panel data.

Decision Rule
Reject null hypothesis (Ho) if p-value is < 5% otherwise accept the null hypothesis (Ho).

Model Specification
The guiding econometric model for this research is specified thus:

Implicitly: $PRO_{it} = f(HSC_{it}, ST_{it}, LIT_{it})$......................... (3.1)

The explicit panel econometric model is specified thus:

$$PRO_{it} = \beta_{0it} + \beta_{it}HSC + \beta_{it}ST + \beta_{it}LIT + \mu$$

Where:
PRO = Profit for the Year
HSC = Health and Safety Costs
ST = Staff Training
LIT = Litigation claims/fines
i = Individual manufacturing company
t = Time Series
β's = structural Parameters to be estimated
μ = Stochastic Error Term

4. Data Presentation Analysis of Results

Table 4.1.1: Panel Regression Output
Dependent Variable: PRO
Method: Panel Least Squares
Date: 10/18/20   Time: 06:10
Sample: 2010 2019
Periods included: 10
Cross-sections included: 5
Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.318454	2.077879	3.522078	0.0010
HSC	-0.134585	0.198956	-0.676454	0.5021
CD	0.449525	0.158633	2.833735	0.0068
LIT	-0.095937	0.100278	-0.956711	0.3437

R-squared	0.334020	Mean dependent var	15.86305
Adjusted R-squared	0.290587	S.D. dependent var	2.098070
S.E. of regression	1.767135	Akaike info criterion	4.053215
Sum squared resid	143.6473	Schwarz criterion	4.206177
Log likelihood	-97.33037	Hannan-Quinn criter.	4.111463
F-statistic	7.690386	Durbin-Watson stat	0.880631
Prob(F-statistic)	0.000288		

Source: Researcher's Computation Using E-views 10.

Interpretation of the Numerical Coefficients

Table 4.1.1 clearly shows the regression estimation carried out to examine the effect of environmental costs on firm performance of selected companies in Nigeria. The regression output shows that the numerical coefficient for health safety and environmental costs (HSC) yielded a negative numerical estimated coefficient at the magnitude of -0.134585. This practically entails that there is a negative relationship between HSC and the performance of selected firms in Nigeria. One can also that the numerical coefficient implies that a 1% increase in HSC yields a corresponding decrease in performance of firms by 0.134585 and vice-versa.

Furthermore, the numerical coefficient for staff training (ST) yielded a positive value at the magnitude of 0.449525. This implies that staff training contributes positively to the performance of the selected firms in Nigeria. It further implies that with a 1% increase in ST, it will lead to a 0.449525 increase in the performance of firms measured with profit for the year (PRO). It finally implies that there exists a direct relationship between ST and PRO for the period under analysis.

The numerical coefficient of litigation claims/fines (LIT) is -0.095937. This negative value implies that there exists an inverse relationship between litigations and the performance of selected firms measured with profit for the year. This value clearly shows that with a 1% increase in LIT, the level of firm performance is expected to decrease by -0.095937.

Coefficient of Determination (R-Squared)

The result in the table 4.1.1 shows that R-squared value is 0.334020, which implies that approximately 33% of the variation in PRO is explained in the model by the changes in HSC, CD and LIT; leaving approximately 67% to the error term. This also means that the line of best fit was not highly fitted.

F-Statistics

The F-statistics is used to test the statistical significance of the entire regression plane. The result of F-statistic is 7.690386 with a corresponding probability of 0.000288 which implies that the overall regression is statistically significant. This also means that all the independent variables taking together have significant effect on the performance of the firm.

Test of Autocorrelation (Durbin-Watson)

The test of autocorrelation is a test that evaluates if the error terms in a series are serially correlated. The value of the Durbin-Watson from table 4.1.1 yielded 0.880631. This implies that there is no presence of autocorrelation problem in the model. It further implies that the error terms are not serially correlated and hence the regression coefficients are reliable for policy analysis and forecasts.

Test of Hypotheses

The hypotheses stated earlier in this research were tested using the p-value extracted from the regression estimation. Three steps were used to test the hypotheses. In step one; the hypotheses were restated in their null forms. In step two, the results were analyzed while in step three, decisions were made. The decision rule involved the rejection or acceptance of the null hypotheses based on criterion of the techniques of analysis.

Test of Hypothesis One

Ho_1 Health and safety costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

Decision Rule

The decision rule is to reject the null hypothesis (**Ho)** if the probability is less than 0.05 and to accept the null hypothesis (**Ho)** if the probability is greater than 0.05.

Decision

From the above analysis, it is clearly seen that the probability value for health and safety costs (HSC) yielded 0.5021 and it is obviously greater than 0.05. This compels the acceptance of the null hypothesis (Ho_1). Hence; health and safety costs have no significant effect on profit for the year of selected manufacturing companies in Nigeria.

Test of Hypothesis Two

Ho_2: Staff training costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

Table 4.1.2: Presentation and Analysis of Result

Dependent Variable: PRO
Method: Panel Least Squares
Date: 10/18/20 Time: 06:10
Sample: 2010 2019
Periods included: 10
Cross-sections included: 5
Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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LIT	-0.095937	0.100278	-0.956711	0.3437

R-squared	0.334020	Mean dependent var	15.86305
Adjusted R-squared	0.290587	S.D. dependent var	2.098070
S.E. of regression	1.767135	Akaike info criterion	4.053215
Sum squared resid	143.6473	Schwarz criterion	4.206177
Log likelihood	-97.33037	Hannan-Quinn criter.	4.111463
F-statistic	7.690386	Durbin-Watson stat	0.880631
Prob(F-statistic)	0.000288		

Source: Researcher's Computation Using E-views 10

Decision Rule

The decision rule is to reject the null hypothesis (**Ho)** if the probability is less than 0.05 and to accept the null hypothesis (**Ho)** if the probability is greater than 0.05.

Decision

From the above analysis, it is clearly seen that the probability value for staff training (ST) yielded 0.0068 and it is obviously less than 0.05. This compels the rejection of the null hypothesis (Ho_2). Hence; staff training costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

Test of Hypothesis Three

Ho_3 Litigation claims/Fines have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

Table 4.1.3: Presentation and Analysis of Result

Dependent Variable: PRO
Method: Panel Least Squares
Date: 10/18/20 Time: 06:10
Sample: 2010 2019
Periods included: 10
Cross-sections included: 5
Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.318454	2.077879	3.522078	0.0010
HSC	-0.134585	0.198956	-0.676454	0.5021
ST	0.449525	0.158633	2.833735	0.0068
LIT	-0.095937	0.100278	-0.956711	0.3437

R-squared	0.334020	Mean dependent var	15.86305
Adjusted R-squared	0.290587	S.D. dependent var	2.098070
S.E. of regression	1.767135	Akaike info criterion	4.053215
Sum squared resid	143.6473	Schwarz criterion	4.206177
Log likelihood	-97.33037	Hannan-Quinn criter.	4.111463
F-statistic	7.690386	Durbin-Watson stat	0.880631
Prob(F-statistic)	0.000288		

Source: ***Researcher's Computation Using E-views 10***

Decision Rule

The decision rule is to reject the null hypothesis (**Ho)** if the probability is less than 0.05 and to accept the null hypothesis (**Ho)** if the probability is greater than 0.05.

Decision

From the above analysis, it is clearly seen that the probability value for litigations/fines (LIT) yielded 0.3437 and it is obviously greater than 0.05. This compels the acceptance of the null hypothesis (Ho_3). Hence; litigation claims/fines have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

4.2 Discussion of Findings/Results

In the course of this study, three objectives, research questions and research hypotheses were outlined. To actualize them, the panel regression analysis was carried out on the corresponding variables and findings were made. These findings are discussed here accordingly.

The first objective was to ascertain the effect of health and safety costs on the profit of the year of selected companies in Nigeria. To actualize this objective, data for the corresponding variables were compiled and estimated using the panel data regression analysis. Findings of the analyses revealed that health and safety costs have a negative and no significant impact on profit for the year of selected companies in Nigeria. This simply entails that on the average, health and safety costs contributes negatively to the performance of the selected firms but not significantly. This further shows that even though health and safety costs is a dimension of expenditures, it is not burdening enough to take the companies out of business, hence; the insignificance. This is in line with the findings of Hassel, Nilsson and Nyquist (2005).

The second objective of the study was to evaluate the effect of staff training on the profit for the year of selected companies in Nigeria. In actualizing this objective, data for the corresponding variables were generated and estimated using the panel longitudinal regression. Findings from the analysis revealed that staff training have a positive and significant impact on profit for the year of selected companies in Nigeria. This further entails that performance of firms increase proportionally with staff training expenditures of the selected companies. This is justifiable as community development/staff training expenditures are costs channeled to human capacity development, who in turn becomes efficient agents of the company on short and long run. This finding is in agreement with the findings of Arong, Ezugwu and Egbere (2014).

The third objective of the study was to ascertain the effect of litigations on the profit for the year of selected companies in Nigeria. Based on the regression results, it was found out that litigations have a negative and insignificant impact on profit for the year of selected companies in Nigeria. Litigation/fines are direct expenditures from defaulting firms that has no economic or profit promise. The negative coefficients of litigations/fines entail that there is an inverse relationship existing between litigation claims/fines and profit for the year of selected firms in Nigeria for the period under analysis. In conclusion, litigation claims/fines reduce profit and deserve to be avoided or minimized. This study is in disagreement with the findings of Ahmed (2019).

5. Summary of Findings

The primary essence of this research is to carry out an empirical analysis of effect of environmental costs on the performance of selected manufacturing/oil and gas companies in Nigeria covering the periods, 2010-2019. To achieve this aim, data for the study were generated from the financial annual statements of the selected companies. The panel data regression was used to estimate the structural parameters of the model. The major findings based on the objectives of the study, are summarized below:

1. Health and safety costs have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.
2. Staff training costs have significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.
3. Litigation claims/fines have no significant effect on profit for the year of selected manufacturing/oil and gas companies in Nigeria.

6. Conclusion

This study has been able to carry out an empirical analysis of effect of environmental costs on the performance of selected manufacturing/oil and gas companies in Nigeria covering the periods, 2010-2019. Based on the findings of this study, it was concluded that environmental costs occupy a strategic and significant place in determining the performance of firms in Nigeria.

7. Recommendations

1. The companies should continuously stick to improve its operation to ensure safe working environment, for example, fumigation exercise, installation of pest and rodent control gadgets.
2. Safety and environmental workshop should be organized for employees to ensure good and safe working environment. Also, Companies are advised to maintain a very high standard of safety with its working environment in compliance with the factories' Act, 1987. Personnel working in risky and hazardous areas should be issued with suitable protective garments.
3. Impart of the production process on environment should be monitored in compliance with the rules and regulations of the Federal Ministry of Environment to avoid huge cost of litigation claims.

8. Contribution to Knowledge

The researcher has been able to contribute to knowledge, filling the research gap by extensively analyzing the individual variables to ascertaining their significance on the companies' performance

It is seen that several studies carried out on the correlation between environmental costs and the performance of firms were mostly at international level, but this is done on local level. Also, some studies carried out on environmental costs have been abandoned or left incomplete by some researchers in Nigeria. Most work on environmental costs varied dependent variables, like return on investment, profit margin, return on capital employed, e cetera, which could be easier to work on unlike this work, where the dependent variables were varied, which was a difficult task of sourcing the related data .This study, therefore, fills the research gap, exhaustively analyzing environmental costs measured by health and safety costs, community development/staff training costs and litigation claims/fines on corporate performance of manufacturing/oil and gas companies in Nigeria.

Suggestions for Further Studies

This present study carried out an analysis on effect of environmental costs on corporate performance in Nigeria. The researcher suggests a further study on the effect of environmental costs on the performance of firms in Nigeria using other environmental expenditures other than the ones used here.

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