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# ENVIRONMENTAL ACCOUNTING AND PROFIT PERFORMANCE OF QUOTED OIL AND GAS COMPANIES IN NIGERIA

**Dr. Solomon Egbe**
Department of Accounting
Faculty of Management Sciences,
University of Port Harcourt, Choba,
Nigeria

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**Abstract:**

*This paper examined the relationship between environmental accounting and the profit performance of listed oil companies and gas companies in Nigeria for a period of 5 years, 2013-2007. The secondary data from the annual report and accounts of five (5) quoted oil and gas companies were used for the analysis to test the formulated hypotheses. The multiple linear regression was the statistical tool used for the analysis, done by e-view 10. The proxy for the independent variable; environmental accounting used is, environmental remediation and pollution control costs white gross profit margin was the proxy for dependent variable; profit performance. The stationary test shows that the variables are stationary at the first difference. The co-integration test proved the presence of a long run relationship. The granger causality test proved no causality between the variables and after testing the hypotheses the variables showed a statistically significant relationship with each other. The paper recommends that, it is essential that oil and gas companies avoid violating environmental legislation to avoid their sanctions, which may adversely affect their profits, and the management of oil and gas companies must have a positive disposition towards cost-effective practices and environmental projects to restore and guarantee stable and sustainable operations in the Nigerian oil sector.*

**Keywords:** Environmental Accounting, Profit Performance, environmental remediation and pollution control costs

## INTRODUCTION

Every company will function properly in clean, welcoming environment, hence the importance of environmental preservation and the adherence to green polices. Shareholders care about the attitude of their company in regards to the environment. They pay attention to the economic consequence of environmental behaviour of the business and how this behaviour impacts on return on investment. No business minded individual will invest in a business where the environs are unkept and degraded.Earth's environment is a rich heritage handed over to us by previous generations. The present civilization has involved us in varied activities. Many of these activities generate waste with potential constituents. The ultimate disposal of the waste leads to environmental pollution in many parts of the world, the magnitude of pollution of the environment has already reached an alarming level, (Pramanil, Shiland, & Das, 2007). The awareness of the environment and man's ability to cause damage started from the fifties of the 19th century. This concern had been repeatedly expressed in a series of international summits and consensus right from time memorial. In recent years, the adverse environmental effect of economic development has become a matter of great public concern all over the world. Gradually the environment is becoming a much more urgent economic, social and politifcal problem. We are now faced with serious challenges of environmental changes such as global warming, oil spillage, health care and poverty. Hence, Investors constant demand that companies go for environmental accounting strategies that will reduce environmental damage and increase shareholders' value and the companies profit performance as a whole.

### Theoretical Framework *Porter's hypothesis*

Traditionally, responding to environmental challenges has been seen as a no-win proposition for business, with the related expenditure seen as a net cost. However, in 1991 Porter posited that stricter environmental regulation would lead to innovative approaches that would enhance competitiveness (Porter, 1991 cited in Porter & Van der Linde, 1995). The hypothesis suggests that strict environmental regulation triggers the discovery and introduction of cleaner technologies and environmental improvements, the innovation effect, making production processes and products more efficient. The cost savings that can be achieved are sufficient to overcompensate for both the compliance costs directly attributed to new regulations and innovation costs. In the first advantage, a company is able to exploit innovation by learning effects and attains a dominating competitive position compared to companies in countries where environmental regulations are enforced much later. Porter's view was critiqued by various authors (Walley & Whitehead 1994; Palmer

et al. 1995; Maxwell, 1996) as being too simplistic. Wagner, Schaltegger, and Wehrmeyer (2001) moderated Porter's hypothesis and developed a model in which the traditionalist view and Porter's hypothesis were combined. The moderated Porter hypothesis argues that companies implementing corporate environmental accounting will perceive some benefits from doing so. The relevance of this theory is that strict environmental regulation would trigger the discovery and introduction of cleaner technologies and environmental improvements, the innovation effect, making production processes and products more efficient in a companies.

## CONCEPTUAL FRAMEWORK

### Environmental remediation and pollution control costs

These are costs of activities which are meant to prevent the production of contaminants and wastes which could cause damage to the environment. The costs include costs incurred in evaluating and selecting pollution control equipment, quality environment consumables, designing processes, designing products and carrying out environment studies. Others are auditing environmental risks and developmental management systems.

### *Gross profit margin*

Gross profit margin is a profitability ratio that calculates the percentage of sales that exceed the cost of goods sold. It is a financial ratio use in measuring the profitability of companies. It assesses a company's financial stability and shows the percentage of revenue that exceeds the cost of goods sold. The gross profit formula is calculated by subtracting total cost of goods sold from total sales. It is also known as gross profit rate, or gross profit ratio.

Formula =

Sales/revenue -cost of goods sold

Sales or revenue

### Empirical Framework

Bassey, Effiok and Eton (2013), whose objective is to examine the impact of environmental accounting and reporting on organizational performance of selected oil and gas companies in Niger Delta region of Nigeria, found that companies which are environmentally friendly will significantly publish environmental related information in their financial statements and other reports of the business. Sarumpaet (2005) using a sample size of 252 listed companies in Indonesia, investigated the relationship between financial performance and environmental reporting. It concluded that that financial performance had no significant relationship with environmental performance. Furthermore, Ngwakwe (2009) in his study titled environmental responsibility and companies performance in Nigeria; investigated the relationship between companies social responsibility practices and their performance. The study while focusing only on the manufacturing industry revealed in his conclusion that a positive relationship exist between the social responsibility practice of companies and their performance.

### Methodology *Research Design*

The survey design was used. This method involves the direct inspection of past records for the purpose of extracting useful information.

### *Population for the Study*

The population of this study was Five (5) quoted Oil and Gas Companies in Nigeria; Total NG, Forte oil pic, Mobil NG, MRS Petroleum and Oando pic registered in the Nigerian Stock Exchange Commission.

### *Sampling/Sample Determination*

The sample size was 5 years (2013- 2017) data selected from the report of the Five (5)1 quoted oil and gas companies registered in the Nigerian Stock Exchange Commission. Purposive sampling technique or judgmental sampling technique was used.

### *Data Collection Method*

Data for the study was collected from secondary sources. Secondary data which was the major source was collected from the Annual Report and Accounts of the Five (5) quoted oil and gas companies in the Nigerian Stock Exchange Commission. The data collected was for the period of 5years, (2013- 2017).

### *Data Analysis Technique*

This work used the ordinary least square, multiple regression analysis on E-view 10 to determine the relationship between the independent variables and the dependent variables. With the aid of; The Unit Root Test, Co-integration Test, Granger Causality Test, Descriptive Analysis

### *Model Specification*

Using dependent variable; Gross Profit Margin and the independent variable; Environmental Remediation and Pollution Control Costs (ERPCC), a model was formulated thus;

Model specification showing the functional relationship is expressed as follows:

$$GPM = f(ERPCC) \quad \ldots\ldots 1$$

Expanding the functional relationship in mathematical terms:

$$GPM = \beta o + \beta i ERPCC \quad \ldots\ldots 1$$

Adding error terms to the econometric form:

$$GPM = \beta o + \beta i ERPCC + p \quad \ldots\ldots :..l$$

Where:

βo = Intercept

β1-3 = Coefficient of the independent variables
ERPCC = Environmental Remediation and Pollution Control Costs,
GPM = Gross Profit Margin

## RESULTS AND DISCUSSION *RESEARCH QUESTIONS*

1. What is the relationship between Environmental Remediation and Pollution Control Costs and Gross Profit Margin?

### *a) Descriptive Statistics*

The table below is the descriptive statistics results gotten from the analysis carried out with the data gotten from the published Annual Reports and Accounts of Five (5) quoted Oil and Gas companies in Nigeria, Gotten from the Nigerian Stock Exchange Commission form 2013-2017.The result of the descriptive statistics is presented in the table below. ***Table 1 Summary of the Descriptive Statistics***

| | ERPCC | GPM |
|---|---|---|
| Mean | 23813352 | 9.275200 |
| *Median* | *8000000.* | *10.02000* |
| Maximum | 1.10E+08 | 17.30000 |
| Minimum | 971000.0 | **1.000000** |
| Std. Dev. | 30274264 | 5.270110 |
| Skewness | 1.468303 | -0.097755 |
| Kurtosis | 4.043744 | 1.980411 |
| | | |
| Jarque-Bera | 10.11776 | 1.122693 |
| Probability | 0.006353 | 0.570440 |
| Sum | 5.95E+08 | 231.8800 |
| Sum Sq. Dev. | 2.20E+16 | 666.5774 |
| | | |
| Observatio ns ; | 25 | 25 |

*Source: Extracts from E-view print out Version 10 and author's compilation*

The result in table 1 provided some insight into the nature of the component of the Environmental Accounting used in this study. The table also shows the component of the Profit Performance of Oil and Gas Companies used. Environmental Remediation and Pollution Control Costs and Gross Profit Margin recorded an average value of 23813352 and 9.275200 respectively. Both variables recorded a standard deviation which is lower than their respective mean and this shows that these variables recorded a slow growth within the period under study. This is also seen in the wide margins between their respective maximum and minimum values. Jarque-Bera statistics which measures whether the series is normally distributed shows that ERPC is statistically significant at 5% and GPM is not.

### *b) Unit R0oot Test*

Table 2 Summary of the Unit Root Test, Augmented Dickey-Fuller (ADF) results at I[sl] Difference.

| | ADF STATISTICS | CKINNON 1% critical Value | 5% critical Value | 10% critical Value | Order of INT | Prob |
|---|---|---|---|---|---|---|
| | | | | | | |
| VARIABLES | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ERPCC | 21.35278 | -3.808546 | 3.020686 | 2.650413 | 1(1) | **0.0000** |
| GPM | 7.388132 | -3.808546 | 3.020686 | 2.650413 | 1(1) | **0.0000** |

*Source: Extracts from E-view print out Version 10 and author's compilation*

The ADF results in Table 2 above shows that ERPCC and GPM showed that the test statistics in absolute terms were less than the test critical values in absolute terms at the conventional levels of significance (1%, 5% and 10%). To this effect the null hypothesis; there is a unit root, implying that the variables are not stationary was rejected and the alternate hypothesis; there is no unit root, implying that the variables are stationary was accepted, thus concludes that the variables are stationary and integrated of order one. This research analysis applied 5% level of significance and judging from the P-values computed they are all below 0.05 and the null hypothesis is also rejected. The results of the variables being stationary at first difference makes it inappropriate for the application of the ordinary least square method of regression, therefore the test to determine the long run relationship can be achieved with the aid of the co-integration test.

### *c) Co-integration Test*

Johansen co-integration test was employed to determine whether variables are cointegrated and will not produce a spurious regression. The result is presented and summarized in the tables below for Trace and Maximum Eigen value co-integration rank test respectively. ;

Table 3 Summary of the Result of Johansen Multivariate Co-integration Test

| Unrestrictec | Co-inteqratio | n Rank Test | Trace) | |
|---|---|---|---|---|
| | | | | |
| Hypothesiz ed No. of CE(s) | Eigen value | Trace Statistic | 0.05 Critical Value | Prob.** Decision |
| None * | 0.967575 | 112.0065 | 69.81889 | 0.0000 Reject |
| At most 1 | 0.606934 | 21.11933 | 29.79707 | 0.3503 Accept |
| Trace test | ndicates 2 co | -integrating e | qn(s) at the 0 | .05 level |
| * denotes rejection of the hypothesis at the 0.05 level | | | | |
| **MacKinnon-Hauq-Michelis (1999) p-values | | | | |
| | | | | |
| Unrestrictec | Co-inteqratic | n Rank Test | 'Maximum Eic | en value) |
| Hypothesiz Ed | | Max-Eigen | 0.05 | |
| No. of CE£sL _ | Eigen value | Statistic | Critical Value | Prob.** Decision |
| None * | 0.967575 | 54.86123 | 33.87687 | 0.0001 Reject |
| At most 1 | 0.606934 | 14.94043 | 21.13162 | 0.2931 Accept |
| Max-eigen | yalue test ind | cates 2 co-int | :eqratinq eqn( | s) at the 0.05 level |
| * denotes rejection of the hypothesis at the 0.05 level | | | | |
| **MacKinnon-Hauq-Michelis (1999) p-values | | | | |
| | | | | |

It can be seen from Table 3 that both the Trace Statistic and the Maximum- Eigen Value Statistic indicate the presence of co-integration among the variables. This confirms the existence of a stable long-run relationship amongst the variables and assures that the variables will not produce a spurious regression.

### *d) Granger Causality Tests*

| Pairwise Grahger Causality Tests | | | |
|---|---|---|---|
| Date: 05/04/19 Time: 21:43 | | | |
| Sampled. 25 Lags: 2 | | — | - |
| Null Hypothesis: | Obs | F-Statistic | Prob. |
| GPM does not Granger Cause ERPCC | 23 | 0.01954 | 0.9807 |
| ERPCC does not Granger Cause GPN | | 0.88377 | 0.4304 |

*Source: Extracts from E-view print out Version 10 and author's compilation*

The result of the test presented above proves that there is no causal relationship between the variables .This makes the null hypotheses acceptable.

### *e) Regression Test*

Ordinary Least Square was employed to measure the relationship between Environmental Accounting and Profit Performance of Quoted Oil and Gas Companies in Nigeria. The results obtained are presented in the tables below.

**Table 5: GPM = $B_0$ + BiERPCC + u..** ....1

| Dependent Variable: GPM | | | | |
|---|---|---|---|---|
| Method: Least Squares | | | | |
| Date: 05/04/19 Time: 21:53 | | | | |
| Sampje: 1_25<br>Included observations: 22 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| ERPCC | 0.135007 | 40.800008 | 3.299422 | 0.0038 |
| R-squared | 0.327216 | Mean dependent Var | | 8.558636 |
| Adjusted R-squared | 0.466923 | S.D. dependent Var | | 5.081559 |
| S.E. of reqression | 6.154610 | Akaike Info criterion | | 6.598404 |
| Sum squared Resid | 719.7053 : | Schwarz criterion | | 6.747182 |
| Log likelihood | -69.58244 | Hannan-Quinn criter. | | 6.633451 |
| Durbin-Watson Stat | 1.226672 | | | |
| -- | | | | — |

*Source: Extracts from E-view print out Version 10 and author's compilation*

The result shows that the coefficient of ERPCC has a positive relationship with GPM to the extent that a percentage

increase or a unit change in ERPCC will result to a 14% increase in GPM of the five Quoted Oil and Gas Companies in Nigeria for the period under investigation. Coefficient of Determination ($R^2$): This shows the value of changes in the dependent variables attributable to changes in the explanatory variables. $R^2$ is the ratio that explains the variation in the model. From the result, 33% and 47% of the total variable of GPM can be explained by the independent variable; ERPCC in a multiple relationship. The remaining the 67 and 53 of the total variation were not fully included in the model but have been taken care of by the error term. Durbin Watson: The Durbin Watson statistics from the result is 1.226672 this value is below 1.5; hence there is a minimum presence of serial auto correlation in the model. The findings are however fit for short and long term decision making. F-statistics: This shows goodness of fit of the model, with probability values of less than 0.05 for ERPCC. It means there is a significant relationship between the independent variable ERPCC and the dependent variable GPM of the five Quoted Oil and Gas Companies in Nigeria for the period under investigation.

***Test of Hypothesis***

HOi: There is no significant relationship between Environmental Remediation and Pollution Control Costs and Gross Profit Margin

## Summary, Conclusion And Recommendations *Summary*

The stationary test shows that the variables are stationary at the first difference.
The co-integration test proved the presence of a long run relationship.
The granger causality test proved no causality between the variables and after testing the hypotheses the variables showed a statistically significant relationship with each other.

### *CONCLUSION*

In accordance with the research findings of the study, we can therefore conclude that Environmental Accounting has a relationship with the Profit Performance of Quoted Oil and Gas Companies in Nigeria. From the analysis carried out, Environmental Remediation and Pollution Control Costs was significant in explaining the Profit Performance of Quoted Oil and Gas Companies in Nigeria. Such costs are incurred because of environmental protection such as emissions treatment as well as wasted material, capital and labour which so called 'non product output' as a result of inefficiency in production activities. It is therefore imperative that oil and gas companies avoid breaking environmental laws to avoid its penalties that may affect their profit performance negatively.

### *RECOMMENDATION*

After a careful analysis and critical appraisal of the research topic, this paper therefore makes the following recommendations:
Management of oil companies should have positive disposition towards environmental cost friendly practices in order to restore and guarantee stable and sustainable operations in the oil sector of Nigeria.
Management of oil companies should develop a well articulated environmental costing system in order to guarantee a conflict free corporate atmosphere needed by managers and workers for maximum productivity.
Government , should make Environmental Reporting in annual reports compulsory since most organization hardly report their environmental activities in their report.
Government agencies should give tax credit to organisations that comply with its environmental laws of the land which will encourage environmental reporting and also help their profit performance
Companies should adhere strictly to the environmental laws of the nation in order to avoid heavy and outrageous penalties and fines levied against them that may affect their profit performance.

### *CONTRIBUTION TO KNOWLEDGE*

This study will create more awareness on the importance of safe environmental practice which will not affect a firm's profitability but instead will increase a firms profit, create more environmental friendly products, protect the environment, facilitate environmental accounting and general corporate social responsibility to enhance society growth and its environment.

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