



Evaluation of Environmental Accounting, Financial Reporting and Profitability of Oil and Gas Firms in Nigeria

Hwerien Rosemary Idamoyibo¹

Abstract: This study evaluates environmental accounting, financial reporting and profitability of oil and gas firms in Nigeria. The study ascertains the relationship between environmental accounting reporting standard index and Return on Asset; Liquidity and Tobin's q; and relationship between Leverage and Tobin's q of the selected oil and gas firms in Nigeria, 2009 to 2019. The study adopts the *ex-post facto* design. The population of the study comprises the twelve (12) oil and gas firms listed on the Nigeria Stock Exchange. The sample size of six (6) of the oil and gas firms was randomly selected and used, the data was obtained from the annual financial reports of the listed oil and gas firms. The study explores panel and pool data (cross-sectional data), application of ordinary least square (OLS), and multiple regression to analyze the data. The results show that there is no significant relationship between ERA and ROA, $t\text{-test}=0.98>0.05$, there is a significant relationship between LQT and TOQ, $t\text{-test}=0.8>0.05$, while there is no significant relationship between LVG and TOQ, $t\text{-test}=0.017<0.05$. The study concludes that there is a weak relationship between environmental accounting, financial reporting and profitability of the oil and gas firms in Nigeria.

Keywords: Evaluation; Environmental Accounting; Financial Reporting; Profitability

JEL Classification: Q56

1. Introduction

The importance of environmental accounting has drawn the attention of stakeholders, including accountable company executives operating in societies. Environmental accounting is one of the trending issues for businesses worldwide and the reasons for this are wide-ranging, stemming from both internal and external environment of the firm mainly at the international level (Okoye & Ngwakwe, 2004). There are several government laws and regulations that have been put in place for environmental protection in a number of countries in the world. The environmental impact assessment act of 1992 and the environmental guidelines and standards for the petroleum industry in Nigeria introduced by the Department of Petroleum Resources (DPR) in 2002 are examples. These make company executives ponder on environmental consequences in their board of management decisions, while organizations that are monitored by environmental policy agencies show much thoughtfulness in decision making. Environmental accounting provides financial reports for both internal and external usage. The internal use includes generating environmental information to help make management

¹ PhD in progress, Department of Accounting, Ignatius Ajuru University of Education, Nigeria, Address: Port Harcourt, Nigeria, Corresponding author: idamoyibohwerien@gmail.com.

decisions on pricing, controlling overhead and capital budgeting, and the external use includes, disclosing environmental information of interest to the general public and to the financial community. International businesses have helped to unite societies and their environmental fortunes for sustainable development. However, environmental difficulties gradually go beyond countrywide restrictions and pose severe challenges to the wellbeing of the earth. The development of active environmental laws and legal systems throughout the biosphere has turned out to direct economic growth and development on the track of environmental sustainability. As financial globalization continues, international financial reporting and auditing standards are progressively more imperative instruments of integration (Firoz, Islamia & Ansari, 2010). The Nigerian business environment, over the years, has issues of raw materials, energy consumption and use of natural resources which have steadily depleted the environment (Enahoro, 2009). The problem for this study is the oil and gas firms' environmental reporting outlay and profitability. It seeks to determine if after providing for environmental expenditures, the firms are still able to meet their obligations, make payment to short term and long term creditors, and perform very well financially to gain competitive advantage over their competitors. Against this setting, this study aims to ascertain the relationship between environmental accounting, financial reporting and profitability of the oil and gas firms in Nigeria.

2. Review of Related Literature

2.1. The philosophical approach and theoretical framework

The philosophical approach and theoretical framework underpinning this study is the deductive and risk society framework which is the eco-efficiency framework and environmental quality cost model of environmental accounting. Unerman and O'Dwyer (2004) and Solomon (2005) portray so well 'a society that is faced with high consequence Social, Ethical and Environmental risks' (SEER). This view was, however, credited as first been mooted by Beck in 1992 and 1999. In the opinion of Solomon, this is another lens view to explain voluntary Social and Environmental Risks (SER). Solomon (2005) argues that Giddens' (1990) and Lupton's (1999) works explain that 'society was becoming characterized increasingly by a decline in trust in institutions and organizations in general'. He argues further that 'it was this decline in trust which was exaggerating the level of risk in society'; and that 'reducing perceived growth in society risk was rebuilding trust as a means of risk reduction'. Solomon and Darby (2005) carried out an empirical research and had series of interviews with company employees from the UK, FTSE 100 to uncover the philosophy and theory of motivation for voluntary SER. They aimed to discover: i) whether a risk society theoretical framework was an appropriate lens through which to view voluntary SER, and ii) whether SER acted as a risk management mechanism for reducing risk and anxiety, nurturing trust and engaging with shareholders, within a risk society theoretical framework. Among severalities of factors for SER verified by Solomon and Darby (2005) were:

- i. Reducing Risk and Anxiety by nurturing Trust, evidence supporting the Risk Society Theoretical Framework;
- ii. Trust and Financial Performance, The Philosophy underlying Voluntary SER; and;
- iii. Evidence supporting a Legitimacy Theoretical Framework for Voluntary SER.

The findings of Solomon and Darby (2005) on Risk Society factor were that interviewees considered that they needed to build trust between themselves and their stakeholders and viewed SER as a

mechanism for promoting trust. The researchers identified a strong link between reputation risk and trust as drivers of SER and that SER was a Social and Environmental Accountability (SEA). They also observed that SER could nurture trust among stakeholders, while Social, Ethical and Environment (SEE) accountability could reduce anxiety among consumers and stakeholders. Although the researchers confirmed respondents' fear of loss of reputation of stakeholders being capable of impacting adversely on corporate profitability, from the findings, they agreed that the Risk Society Theory encapsulates previous theories. They, however, concluded that 'no one theoretical framework is sufficient to view Voluntary SER clearly and that the Risk Society Framework was similarly insufficient in itself. The Risk Society motive was, however, seen as a strong lens to view SER.

2.2. Empirical Review

Kihamba (2017) studied the relationship between environmental accounting and reporting practices as well as the profitability of manufacturing firms. The study employed descriptive research design and the population of the study consists of 10 manufacturing firms listed on the Nairobi Securities Exchange (NSE) as at 31st December, 2016. The study made use of secondary sources of data obtained from published financial reports of the firms, NSE handbook and CMA website. The finding revealed a positive relationship between profitability measured by Return on Asset and independent variables (Environmental Accounting Reporting Index, Liquidity and Leverage).

Babalola (2012) carried out a study on the impact of corporate social responsibility on firms' profitability in Nigeria. The study examined the relationship between corporate social responsibility and firms' profitability in Nigeria. It employed secondary sources of data obtained from ten (10) randomly selected firms' annual reports and financial summary from the period 1999-2008. The study made use of the ordinary least square for the analysis of collected data. The findings revealed that the sampled firms invested less than ten percent of their annual profit on social responsibility. The coefficient of determination of the results obtained showed that the explanatory variable account for fluctuations or disparities in selected firms' performance, and that profit after tax results from changes in corporate social responsibility (CSR) in Nigeria.

Bassey, Effiok and Eton (2013) examined the impact of environmental accounting and reporting on organizational performance with particular reference to oil and gas companies operating in the Niger Delta Region of Nigeria. The study was conducted using the Pearson's product moment correlation co-efficient. The elements were selected by means of random and stratified sampling techniques. Data was gathered from primary and secondary sources. Data collected was presented using tables and Pearson's product moment correlational analysis. It was found from the study that environmental cost has satisfied relationship with firm's profitability. The conclusion was that environmental friendly firms significantly disclose environmental related information in financial statements and reports.

Ebiringa, Yadirichukwu, Chigbu and Ogochukwu (2013) investigated the effects of firm size and profitability on corporate social disclosures, focusing on the Nigerian Oil and Gas sector. A sample of twenty quoted companies was selected for the study, using the simple random sampling technique. Secondary data retrieved from content analysis of the audited financial reports of the selected companies for 2011 financial year was utilized in the study. The ordinary least squares regression technique was used for data analysis. The findings revealed that an insignificant negative correlation exists between CSR disclosure and firm size, while profitability is significantly and positively related to CSR disclosure of the companies.

Che-Ahmad, Osazuwa and Mgbame (2015) investigated environmental accounting and firm profitability in Nigeria. The study aimed to investigate the effects of environmental accounting on the financial performance of firms in Nigeria. It utilized a cross-sectional research design and content analysis to obtain environmental disclosure information on corporate financial performance of companies quoted on the Nigerian Stock Exchange as at 2012. From the audited annual reports, regression analysis and the ordinary least square method were adopted. The results showed that although environmental disclosures individually have insignificant impact on the profitability of the companies, both positive and negative significant relationships with profitability were evident when moderated with firm-specific variables. The results revealed further that there exists a significant relationship between environmental accounting disclosure and firm's profitability when environmental accounting is moderated by firm-specific variables like size, industry type and big four auditors.

3. Methods

The study adopts the *ex-post facto* research design. The population of the study comprises the twelve (12) oil and gas firms listed on the Nigeria Stock Exchange. The sample size of six (6) oil and gas listed firms was randomly selected for the study. These firms are Total Nigeria Plc, 11 Plc (Mobil), Seplat Plc, Oando Plc, Conoil Plc and Forte Oil Plc. The data for the study was obtained from the annual financial reports published by each of the selected oil and gas firms listed on the Nigerian Stock exchange.

3.1. Technique of Analysis

The study explores descriptive statistics, panel and pool data (cross-sectional data); technique of ordinary least square (OLS) and multiple regression with the application of E-views software version 10.0 to analyze the data. The choice of panel regression against other analytical techniques is due to the number of firms with similar data parameters.

Model Specification

This is expressed in its functional form as follows:

$$ROA_{\text{oil and gas}} = f(ERA) \quad (1)$$

$$TOQ_{\text{oil and gas}} = f(LQT, LVG) \quad (2)$$

Where;

ROA = Returns on assets of the selected oil and gas firms.

TOQ = Tobin Q which is the market value of all public firms in the US divided by their replacement cost. Many macroeconomists consider the market overvalued when Tobin's Q is above its long term mean and undervalued when it is below the long-term mean.

ERA = Environmental reporting accounts

LQT = Liquidity of the firms

LVG = Leverage of the firms

The above functional equation is further stated in econometric form as presented below:

$$ROA_t = \beta_{0t} + \beta_1 ERA_t + U_i \quad (3)$$

$$TOQ_t = \beta_{0t} + \beta_1 LQT_t + \beta_2 LVG_t + U_i \quad (4)$$

Where:

U_i = Error Term

$\beta_0 - \beta_2$ = the Parameters

A prior Expectation = $\beta_1 - \beta_2 > 0$

Hypothesis:

H_0 : $\beta > 0$ (there is unit root in the series).

H_1 : $\beta_0 - \beta_1 < 0$ (the series are stationary).

The hypothesis was tested on the basis of t-statistic of the coefficient.

Decision rule: Reject H_0 if test statistic is greater than critical values, otherwise do not reject.

4. Data Analysis and Interpretations

Table 4.1. Descriptive Statistical Results for the Models

	ROA, ERA– Model I	
	ERA	ROA
Mean	3.510433	14907.61
Median	1.170000	3681.920
Maximum	32.62000	113024.5
Minimum	0.030000	3.070000
Std. Dev.	5.425137	20698.57
Skewness	2.477282	1.771155
Kurtosis	9.756790	6.158139
Jarque-Bera	877.5239	281.5225
Probability	0.390053	0.000000
Sum	1053.130	4472283.
Sum Sq. Dev.	8800.202	1.28E+11
Observations	300	300

Source: Author's computation using E-views 10.0

TOQ, LQT, LVG – Model II

	TOQ	LVG	LQT
Mean	89029.84	1.915927	3.510433
Median	29967.84	0.745000	1.170000
Maximum	771365.3	23.61500	32.62900
Minimum	922.1500	-8.989000	0.030000
Std. Dev.	132972.5	3.353246	5.425137
Skewness	2.415582	2.430798	2.477282
KurTOQis	9.324219	12.10671	9.756790
Jarque-Bera	791.6986	1332.092	877.5239
Probability	0.738800	0.000000	0.122000
Sum	26708952	574.7780	1053.130
Sum Sq. Dev.	5.22E+12	3362.033	8800.292
Observations	300	300	300

Source: Author's computation using E-views 10.0

The descriptive statistics specifies the mean, median, standard deviation, skewness, kurtosis and normality in the table. Descriptive statistics shows that the JB, which measures the normality of the trend analysis, has ERA to be normally distributed. For model II, the analysis shows that TOQ and LQT are normally distributed.

4.2. Panel Regression Analysis

The panel and pool data (cross-sectional data) for each of the models are presented, compared and analysed below. Researcher used the Hausman test to choose the best fit model between fixed and random analysis. This was used to analyse the hypotheses as stated in the introduction.

Table 4.3. Multiple Regression Tests: Model I

Variables	Pooled OLS		Panel OLS (Fixed effects)		Panel OLS (Random effects)	
	Coeff	Prob.	Coeff.	Prob.	Coeff.	Prob.
C			0.112411		0.146221	
ERA	208.4308	0.0000	243.4850	0.3234	117.9283	0.6173
R-Square	-0.102855		0.582764		0.014166	
F-Test			2.853957	0.007359	1.009815	
DW	0.525374		2.173103		1.785686	

Source: Author's computation using E-views 10.0

Table 4.4. Multiple Regression Tests: Model II

Variables	Pooled OLS		Panel OLS (Fixed effects)		Panel OLS (Random effects)	
	Coeff	Prob.	Coeff.	Prob.	Coeff.	Prob.
C			0.038343			
ERA	0.278240	0.0000	-1777.493	0.4300	-948.6484	0.6097
R-Square	-0.003076		0.144701		0.041671	
F-Test			2.992397	0.150668	2.326340	0.102573
DW	1.997892		0.530394		0.509097	

Source: Author's computation using E-views 10.0

4.3. Stationarity Test

In an attempt to confirm the order of integration of the series under study, thereby confirming their suitability for a linear combination in the form of a model, the panel unit root test followed the form specified as ADF – Fisher Chi-Square.

Panel Unit Root Tests for all the Variables using ADF – Fisher Chi Square

Variables	ADF	Prob.V	INT	REMARK
ROA	83.0195	0.0000	I (1)	stationary
TOQ	41.4258	0.0033	I (0)	stationary
ERA	13.4291	0.0079	I (1)	stationary
LVG	8.44256	0.0033	1 (1)	stationary
LQT	2.24534	0.0041	1 (1)	stationary

Source: Author's computation, E-view 10.0

Table above shows the results of the ADF-Fisher Chi Square Panel Unit Root Tests of all the variables. The results are found to be integrated of the same order. At second difference, the p-values are found to be less than 5% which is the level of significance. Unlike Philip-Peron statistics which follows the precondition for the Engle and Granger residual based approach for cointegration tests ($PP \leq$ critical value), emphasis on ADF-Chi Square statistics is on P-value.

Tests of Hypotheses

Model I

H₀₁: *There is no significant relationship between ERA and ROA of listed Oil and Gas firms in Nigeria.*

The analysis in model I was based on the fixed effects as shown by the significance of the hausman test. The analysis shows that the goodness-of-fit, $R^2 = 0.58$. Therefore, 58% of the changes in the dependent variables is caused by the changes in the independent variable. The f-test of 24 shows that the model is statistically significant. Again, the analysis shows that ERA is positively related to ROA. The result further shows that as ERA increases by a unit, ROA increases by 243.4850 and vice versa. The result also shows that ERA is statistically insignificant using the t-test=0.98. We, therefore, accept the null hypothesis, reject the alternative and conclude that there is no significant relationship between ERA and ROA within the period studied.

Model II

The analysis of model II was also based on the fixed effects as shown by the significance of the hausman test. The analysis shows that the goodness-of-fit, $R^2 = 0.14$. Therefore, 14% of the changes in the dependent variables is caused by the changes in the independent variables. The f-test of 2.9 shows that the model is statistically significant.

H₀₂: *There is no significant relationship between LQT and TOQ of listed Oil and Gas firms in Nigeria.*

Again, the analysis shows that LQT is negatively related to TOQ. The results show that as LQT increases by a unit, TOQ decreases by -1777.493 and vice versa. The result also shows that LQT is statistically insignificant using the t-test=0.8. We, therefore, accept the null hypothesis, reject the alternative and conclude that there is a significant relationship between LQT and TOQ.

H₀₃: *There is no significant relationship between LVG and TOQ of listed Oil and Gas firms in Nigeria.*

Again, the analysis shows that LVG is positively related to TOQ. The results show that as LVG increases by a unit, TOQ increases by 54.60907 and vice versa. The result shows that LVG is statistically insignificant based on the $t\text{-test}=0.017$. We, therefore, accept the null hypothesis, reject the alternative and conclude that there is no significant relationship between LVG and TOQ within the period studied.

5. Discussion of Findings

The analysis has been able to synthesize the relationship between environmental accounting and return on assets of oil and gas firms in Nigeria over the period of eleven years. Based on the results, it was discovered that ERA has a positive but insignificant relationship with the ROA. This agrees with the findings of Kihamba (2017) which state that there is a positive relationship between ERA and ROA of 10 manufacturing firms in Nigeria. The finding, however, disagrees with the findings of Bassey, Effiok and Eton (2013) which show that environmental cost had satisfied relationship with firm's profitability.

Again, the results show that liquidity (LQT) has a negative and insignificant relationship with Tobin's Q ratio. With an increase in liquidity of the oil and gas firms, there will be a decrease in the TOQ ratio by -1777.5. This generally disagrees with the findings of Babalola (2012) which state that the sampled firms invested less than ten percent of their annual profit on social responsibility.

Finally, the study found that there is a positive but insignificant relationship between LVG and TOQ. Tobin's Q was used by Ebiringa, Yadirichukwu, Chigbu and Ogochukwu (2013) and they arrived at the same conclusion with this study. However, the findings did not agree with the findings of Che-Ahmad, Osazuwa and Mgbame (2015) which show a significant relationship between environmental accounting disclosure and firm's profitability when environmental accounting is moderated by firm-specific variables like size, industry type and big four auditors.

6. Conclusion and Recommendations

The study was able to analyze environmental accounting, financial reporting and returns on assets as well as the effects of leverage, liquidity on Tobin Q's ratio of the oil and gas firms in Nigeria over the period of eleven years using the technique of panel regression analysis. This technique was informed by the nature of the data involved. Using the Hausman analysis, the study chose the fixed effect model and used the same to test the hypotheses. Again, panel unit roots and cointegration were also analysed.

Clearly, the study shows that environmental reporting accounts has positive and significant relationship with the return on assets of the oil and gas firms in Nigeria over the period and as the accounting increases, so does the return on assets and vice versa. In the same vein, the study reveals that liquidity has negative and insignificant relationship with Tobin Q. Finally, there is a positive and insignificant relationship between leverage and Tobin Q's ratio of the oil and gas firms in Nigeria over the same period. The study concludes that there is a weak relationship between environmental accounting, financial reporting and profitability of the oil and gas firms in Nigeria.

It is, therefore, recommended that the oil and gas firms should increase their ERA (environmental accounting) as this also increases their returns on assets. This evidence could be as a result of the goodwill enjoyed through the ERA in their host communities and this basically rubs off on the oil and

gas firms in a positive way. Also, the liquidity rate should be managed as much as possible based on the glaring fact that it is negatively related to the Tobin Q ratio over the period of this study. However, there should be more emphasizes on LVG since it has negative and insignificant relationship with the Tobin Q ratio of the firms.

References

- Babalola, Y. A. (2012). The impact of corporate social responsibility on firms' profitability in Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 45, pp. 39-50.
- Bassey, B. E.; Effiok, S. O. & Eton, O. E. (2013). The Impact of Environmental Accounting and Reporting on Organizational Performance of Selected Oil and Gas Companies in Niger Delta Region of Nigeria. *Research Journal of Finance and Accounting*, 4(3), pp. 57-73.
- Beredugo, S. B. & Mefor, I. P. (2012). The study evaluated the relationship between environmental accounting and reporting and sustainable development in Nigeria. *Research Journal of Finance and Accounting*, 3(7), pp. 55-63.
- Che-Ahmad, A.; Osazuwa, N. P. & Mgbame, C. O. (2015). Environmental accounting and firm profitability in Nigeria: Do firm-specific effects matter? *The IUP Journal of Accounting Research & Audit Practices*, 14(1), pp. 43-54.
- Ebiringa, O. T.; Yadirichukwu, E.; Chigbu, E. E. & Ogochukwu, O. J. (2013). Effect of firm size and profitability on corporate social disclosures: The Nigerian oil and gas sector in focus. *British Journal of Economics, Management & Trade*, 3(4), pp. 563-574.
- Enahoro, J. A. (2009). Design and bases of environmental accounting in oil & gas and manufacturing sectors in Nigeria. *Unpublished PhD Thesis*, Covenant University Ota, Nigeria.
- Firoz, M.; Islamia, J. M. & Ansari, A. (2010). Environmental accounting and international financial reporting standards (IFRS). *International Journal of Business and Management*, 5(10), pp. 105-112.
- Kihamba, R. I (2017). The relationship between environmental accounting and reporting practices and profitability of manufacturing firms listed on Nairobi securities exchange. *Unpublished Master Research Project*, University of Nairobi.
- Nigeria Stock Exchange (2020). *The Complete List of Listed Companies in Nigeria*. <https://topforeignstocks.com/stock-lists/the-list-of-listed-companies-in-nigeria/> and [TopForeignStocks.com](https://topforeignstocks.com).
- Okoye, A. E. & Ngwakwe, C. C. (2004). Environmental accounting: A convergence of antecedent divergence. Accountancy; management companion, edited by Ezejelue, A. C. & Okoye, A. E. *Nigerian Accounting Association (NAA)*. Nigeria.
- Solomon, J. F. (2005). From the erotic to the corporate: A Giddensian view of trust between companies and their stakeholders. *Working Papers*, Cardiff Business School.
- Solomon, J. & Darby, L. (2005). Is private social, ethical and environmental reporting.
- Unerman, J. & O'Dwyer, B. (1 September, 2004). Theorising CSR/CSD as a hegemonic risk discourse. Paper presented at the *International Congress on Social and Environmental Accounting*. Dundee.