Green Proficiency Accounting and Yields of Oil & Gas Consortiums: Nigeria's Outlooks

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***Abstract*—** The investigation was on green proficiency accounting and yields of the oil and gas consortiums: Nigeria's outlooks. The survey explicitly measured the effect of oil emission cost, oil waste controlling cost and gas diffusion cost on the return on equity nominated oil consortiums in Nigeria. The study embraced the ex-post facto design and obtained data from the yearbooks of the carefully chosen consortiums. The pane method was useful in valuing the studies constraints and strictures. Outcomes from the pane regression valuation indicated that oil emission cost has adverse and substantial influence on the profit after tax of oil consortiums in the upstream subdivision; gas spreading cost has a negative and irrelevant influence on the profit after tax of oil consortiums in the upstream sector and oil waste management cost has a negative and irrelevant effect on the profit after tax of oil consortiums in the upstream sector. Based on these findings, the study recommended that oil and gas consortiums should develop an anti-spillage strategy to enhance the prevention and/or timely detection of oil spillage to reduce the allocated cost for spillage relate activities and so enhance profitability and return on assets. Also, oil consortiums should formulate policies to reduce gas flaring through adequate inspection and monitoring of exploration activities to reduce the allocated cost for gas flaring and lastly, adequate controlling of oil waste should be energized and encouraged to congeal the petroleum products and augment profitability and the causative power of the assets of the oil consortiums in Nigeria.

***Keywords*—** Accounting, Consortiums, Gas, Green, Oil, Proficiency, Yields

1. INTRODUCTION

Green proficiency accounting is an all-encompassing facet of "accounting. It engenders information for both inside and outside uses, making available environmental information using modern information tools to assist management decisions on controlling overhead, capital budgeting process towards maximization of value of stakeholders and transfer pricing of goods and services produced by conglomerates within the environs, and external use, disclosing environmental information of concern to the government, public and to the financial community. Though green regulations, pressure group activities and consumer awareness is weak in developing countries, some corporations in these countries are becoming conscious of their international market and are making appreciable effort as regards sustainable business practices such as the use of responsibilities based outlay practice that ensures work consign efficiency in special consideration business (Udoayang, Asuquo & Akpan, 2020). It has asserted that organisations in search of earnings can cause undistorted societal damage and the environment writhes, hence, there is a stress for a meeting point concerning corporate objective of profit intensification besides the need for environmental controlling. In this veneration, the inevitability for environmental cost has become the trepidation and concentration of nations and answerable corporate managements are entreated. Environmental management and controlling schemes have technologically advanced as means to thoroughly applying business management to environmental costs to augment an organization's long-run financial performance by evolving processes and products that concurrently advance unassertiveness and environmental performance. However, the upsurges in universal environmental mindfulness as well as the drive for maintainable economic growth enlargement are diffusing the responsiveness of corporate bodies towards environmental costs. Environmental costs have been lengthened to account for product design for perpetuity besides sustainability, recycling and disassembly; process design to reduce environmental waves of operations; worker training; research and enlargement. A variety of government code of practice, societal pressure groups and green consumer pressure are some of the contemporary trends and current growths and enlargement invigorate corporate consideration to the strategic and competitive role of a corporate entity in capturing benefits associated with environmental sustainability and stewardship without fraudulent practices since these practices are controlled by the use investigative legitimate tool (Murphy,2003, Asuquo, Dan & Effiong, 2020a, Uwah & Asuquo, 2016, Udoayang, Akpanuko & Asuquo, 2009, Asuquo, 2011a, Asuquo & Udoayang, 2020,

Asuquo, 2012a, Asuquo, Dan & Effiong, 2020c, Ifurueze, 2013).

Eco-friendly and conservational management schemes have become known as means to methodically and scientifically apply business management to environmental costs to enhance a corporate entity's long-run financial performance by developing processes and products that concurrently improve competitive and environmental performance (Stead,1992). However, within the emerging nations, the empathetic is moderately diverse mostly because of brittle government rules and lacking of systematized pressure assemblages beside send users perception to stimulate commercial deeds positively. Environmentally friendly or green ecological overheads in relations of operative structural cost lessening are enormously practicable methodology in the direction of decision-making justification of green and eco-friendly regulatory scheme disbursements. As a result, green and conservational costs make available a structure to eco-friendly accountability besides company monetary performing. The gradation to which conservational costs stimulate business yielding is predicted or projected by certain factors, such as oil spillage cost, price changes, oily waste controlling cost as well as gas flaring cost suffered by oil and gas upstream consortiums in Nigeria. The effect of these dynamics and subtleties on business performing, epitomized here by return on assets and profit after tax, was observed in this exploration (Asuquo & Effiong, 2010, Effiong & Asuquo, 2010). The foremost purpose of this exploration was to plump the consequence of green proficiency accounting on business accomplishment of oil and gas consortiums in Nigeria. Explicitly, the exploration sought to accomplish the succeeding goals: To decide the connection flanked by oil spillage cost and return on assets of oil and gas upstream consortiums in Nigeria; to scrutinise the consequence of oily discarded controlling cost on return on assets of oil and gas upstream consortiums in Nigeria; to depict the influence of gas flaring cost on return on assets of oil and gas upstream consortiums in Nigeria; to assess the extent oil spillage cost affect profit after tax of oil and gas upstream companies in Nigeria; and to investigate the effect oily discarded controlling cost has on profit after tax of oil and gas upstream consortiums in Nigeria.

1.1 Concept of green proficiency accounting

Environmental accounting is a term with a variety of meanings. In many contexts, environmental accounting is taken to mean the identification and reporting of environmental specific costs, such as liability costs or waste disposal costs. Environmental accounting involves any costs and benefits that arise from changes to a firm's products or processes, where the change also involves a change in environmental impacts (James, 1998). Furthermore, it is highlighted that environmental accounting information need not be the product of accountants, nor need it be used by accountants. Instead, it is any information with either explicit or implicit financial content that is used as an input to a firm's decision – making. Product designers, financial analysts, and facility managers are equally to be the users of environmental accounting data. Also, almost any type of business information collected and analysed by firms concerning the environment will qualify as environmental accounting information. Examples include input price aggregate indices, economic policy versus economic growth analysis and price increases rate, evaluation of foreign exchange rate exposure risk on the performance of companies operating within the green environment, and interest rate as it affects net assets of multinationals, technical and scientific studies that relate production processes to physical outputs and legal, marketing and financial analyses. It should again be noted that environmental accounting is used to asses full environmental costs associated with activities or products. Many scholars emphasized that environmental accounting can be used to track environmental performance of organizations in more measurable manner in order to ascertain and guarantee the attainment of wealth maximization goals of the stakeholders. The key areas for monitoring are aggregated emission to air, water effluent discharge, soil contamination and boundary noise level (Seetharaman, 2007, Asuquo, 2012b, Asuquo, 2012c, Asuquo, Fadenipo, Ogbeche & Ahonkhai, 2017, Asuquo, & Arzizeh, 2012).

Environmental accounting is an emerging and dynamic field. It is a fruitful attempt to identify and bring to the light the resources exhausted and cost differential through the capacities of the firm; rendered reciprocally to the environment by the business houses. Environmental accounting reveals that corporate managers are placing high priority on environmental accounting in order to ascertain the historical cost of acquisition of the natural resources and compare it to the current value and the capability of the firm and also ascertain the kind of dividend; whether cash dividend using a specified model or profit plough back method, to give to the shareholders to encourage them to continue to invest in the businesses within a sustainable environment. Environmental accounting is usually involved in several areas, such as: energy accounting,

waste accounting, environmental criteria in capital expenditures, target setting for efficiency improvements (Akpan, Asuquo & Udoayang, 2011, Wycherley, 1991, Nagle, 1994, Effiong, Udoayang & Asuquo, 2011). Environmental accounting system is part of a larger corporate environmental policy, which aims to prevent and reduce environmental impact, through life-cycle analysis, integration of environmental values into the supply chain, eco-design of products and services and environmental monitoring and auditing (Dragomir, 2008).

Environmental accounting as a prevalent subject in the international community is not yet a priority in Nigeria. According to the US Environmental Protection Agency (1995), Green accounting or Environmental accounting is defined as: identifying and measuring the costs of environmental materials and activities and using this information for environmental management decisions.

The purpose is to recognize and seek to mitigate the negative environmental effects of activities and systems. Cormier and Gordon (2001) opined that environmental accounting is not only part of a reporting system. It is also a very effective communication tool, since all environmental remedial strategies implemented by managers must be accompanied by disclosure to have any effect on external parties.

That is, information is necessary to change perceptions. Remedial action which is not publicized will not be effective in changing perceptions. Environmental accounting is about making environmental related costs more transparent with corporate accounting systems and reports. In other words, environmental accounting is a system that attempts to make the best possible quantitative assessment (in terms of either monetary or physical units) of the costs and benefits to an enterprise due to the environmental preservation activities that it undertakes.

In the opinion of Howes (2002), environmental accounting does not only focus on internal and external environmental accounting but links environmental and financial performance more visibly. Environmental accounting assists in getting environmental sustainability embedded with an organizations' culture and operations.

The aim is to provide decision makers with the information that enable the organization to reduce costs and business risks and add value and creatively manage their environmental resources and earnings to produce the desired financial reports (Asuquo, 2011a, Asuquo, 2011b). Environmental accounting in the context of national income accounting refers to natural resource accounting, which can entail statistics about a nation 's or region 's consumption, extent, quality, and value of natural resources, both renewable and non-renewable. Environmental accounting in the context of financial accounting usually refers to the preparation of financial reports for external audiences using generally accepted accounting principles and financial accounting standards.

Environmental accounting as an aspect of management accounting serves business managers in making capital investment decisions, costing determinations, process/product design decisions, tax planning to take advantage of tax concession given by government in the environments considered to be liberated commercial zones, performance evaluations, environmental operations review and stakeholders' wealth of extracting firms: Evidence from Nigeria and a host of other forward-looking business decisions that are performed and reported professionally and ethically (Asuquo, Dan, Odey, Linus,Uklala, &Tapang, 2021, Asuquo, 2013, Asuquo, Dada, & Onyeogaziri, 2018, Gray, Bebbington & Walter, 1993, Asuquo & Udoayang, 2020, Asuquo & Akpan, 2012a, Asuquo & Akpan, 2012b, Akpan & Asuquo, 2012).

3. MATERIALS AND METHODS

3.1 Research design: The ex-post facto design was used in this study. The ex-post facto research design was equally adjudged adequate as the happenings on the work had already happened. Unlike the scientific pattern, processes of statistics were used in the therapy of the happenings.

3.2 Data collection technique: The data for this study were extracted from the annual reports of five oil consortiums selected scientifically for this study for the period 2010 to 2019. They include Mobile PLC, Total PLC, Forte Oil, Seplat PLC and Oando PLC.

3.3 Data treatment Technique: The panel data analysis was done using the multiple regression techniques to investigate the relationships that existed among the variables of interest. The study also applied the Hausman test to determine whether the fixed effect or random effect panel was the most appropriate for the study.

3.4 Model specification

The panel model was stated thus:

ROE= F (OSC, GFC, OWMC)

Putting the model in a structured form, we obtained

ROE = β_0+β_1OSC+β2GFC+ +β3OWMC+U

Where;

ROE = Dependent variable= Return on Equity

β_0 = Regression constant

β_1,β_2,β_3,= Unknown parameters

OSC = Oil Spillage Cost

GFC = Gas Flaring Cost

OWMC = Oil Waste Management Cost

U = Stochastic error term

4. RESULTS

Table 1: Result of descriptive statistical analysis

	LPAT	LOSC	LGFC	LOWMC
Mean	15.61775	18.84143	17.69707	17.75110
Median	15.48141	18.77538	18.09055	17.87474
Maximum	17.99919	19.94975	18.58930	18.44896
Minimum	13.82299	17.53846	11.52499	16.96083
Std. Dev.	0.767382	0.637179	1.147188	0.610228
Skewness	0.462045	-0.088991	-3.535931	-0.120116
Kurtosis	4.061376	2.125559	18.93498	1.280938
Jarque-Bera	3.878405	1.559469	595.2059	5.900236
Probability	0.143819	0.458528	0.000000	0.052334
Sum	734.0343	885.5470	831.7623	834.3017
Sum Sq. Dev.	27.08825	18.67587	60.53785	17.12938
Observations	47	47	47	47

Source: Eview 9.1 Computation, 2021.

Table 1 is the result of the descriptive analysis of the data used in this study. The result in table 1 shows that upstream oil companies profit after tax, hereafter called PAT has an average value of 15.61775 with a standard deviation of 0.767382 ranging from 13.82299 as minimum to 17.99919 as maximum values.

Oil Spillage Cost has its mean value as 18.84143, a standard deviation of 0.637179 with a range from 17.53846 as minimum to19.94975as maximum. Gas Flaring Cost has a mean value of 17.69707. Its minimum value is 11.52499 and maximum is 18.58930 with a standard deviation of 1.147188. Oil Waste Management Cost showed a mean value of 17.75110, a standard deviation of 0.610228 and ranges between a minimum value of 16.96083 and a maximum value of 18.44896.

Again, analysis of the descriptive statistics revealed that, the OSC, GFC and OWMC were negatively skewed, "meaning that their means are also peaked to the left.

The mean of PAT however is peaked to the right of the distribution as it is skewed to the right (positively skewed). The coefficient of the kurtosis of the OSC and OWMC were below 3.00000, meaning that they are platykurtic relative to the normal, meaning that their distribution produces fewer and less extreme outliers than does the normal distribution. However, the coefficient of the kurtosis of the PAT and GFC were above 3.00000, meaning that they are leptokurtic relative to the normal, meaning that their distribution produces heavier and more extreme outliers than does the mesokurtic distribution.

The Jarque-Bera values of 3.878405, 1.559469 and 5.900236 for PAT, OSC and OWMC respectively with their respective p-values of 14.38 per cent, 45.85 per cent and5.23 per cent means that they are normally distributed".

However, the Jarque-Bera value of 595.20 for GFC and its corresponding probability value less than 5 per cent means that data collected for gas flaring cost were not normal distributed and this is not desirable.

However, since data collected on all other variables were normally distributed, we can proceed to use the panel least square model

Table 2: Panel least Square: Dependent Variable: LPAT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.84825	4.823427	4.736934	0.0000
LOSC	-0.035021	0.179519	-0.195080	0.8462

LGFC	-0.024970	0.099948	-0.249829	0.8039
LOWMC	-0.345262	0.184847	-1.867824	0.0686
R-squared	0.079032			
Adjusted R-squared	0.014778			
F-statistic	1.230000	Durbin-Watson stat		2.008771
Prob(F-statistic)	0.310449			

Source: Eviews 9.1 Output, 2021

From table 2, all the coefficients of our independent variables are insignificant and negative, and contradict economic theories. Also, our R- square adjusted shows the variables have not explained the model. The F-statistics also shows that the model does not have a good fit. Therefore, it is inappropriate to base our findings on the Panel least square model. The study proceeds therefore to run the fixed and random effects models as presented below.

Table 3: Fixed effect model output: Dependent Variable: LPAT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.49646	8.578894	2.039477	0.0482
LOSC	-0.011609	0.002232	-5.201164	0.0095
LGFC	-0.020168	0.104590	-0.192829	0.8481
LOWMC	-0.073407	0.427031	-0.171902	0.8644
	Effects Specification			
"Cross-section fixed (dummy variables)				
R-squared	0.758531			
Adjusted R-squared	0.707498			
F-statistic	4.049644	Durbin-Watson stat		2.148691
Prob(F-statistic)"	0.013519			

Source: Eviews 9.1 Output, 2021

From table 3, only the coefficient of oil spillage cost is significant to measure companies profit after tax. The coefficients of gas flaring cost and oil waste management cost were insignificant statistically to measure the profit after tax of oil firms in Nigeria. This contradicts economic theories. Also, the R- square adjusted value of 70.749 per cent shows the variables have explained the model. The F-statistics value of 4.04 also shows that the model has a good fit. This is desirable; however, we need to also estimate the random effect model to determine whether or not it will produce a better result.

The study proceeds therefore to run the random effects model as presented below:

Table 4: Random effect model output

Dependent Variable: LPAT

Method: "Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.84825	4.841216	4.719528	0.0000
LOSC	-0.035021	0.003181	-11.00943	0.0000
LGFC	-0.024970	0.100316	-0.248911	0.8046
LOWMC	-0.345262	0.185529	-1.860961	0.0696
	Effects Specification			
			S.D.	Rho

Cross-section random		0.000000	0.0000
Idiosyncratic random		0.764500	1.0000
	Weighted Statistics		
R-squared	0.879032		
Adjusted R-squared	0.814778		
F-statistic	8.230000	Durbin-Watson stat	2.008771
Prob(F-statistic)	0.000449		
	Unweighted Statistics		
R-squared	0.079032	Mean dependent var	15.61775
Sum squared resid	24.94742	Durbin-Watson stat"	2.008771

Source: Eviews 9.1 Output, 2021

From table 4, only the coefficient of oil spillage cost is significant to measure companies' profit after tax. The coefficients of gas flaring cost and oil waste management cost were irrelevant statistically to measure the profit after tax of oil consortiums in Nigeria. These contradict economic theories. Also, the R- square adjusted value of 81.477 per cent shows the variables have explained the model. The F-statistics value of 8.23 also shows that the model has a good fit. This is desirable as the random effect estimates look better than the fixed effect estimates. Nevertheless, this conclusion cannot be reached by mere looking at the size of the estimates. This therefore calls for application of the Hausman test to determine whether the study should base its analyses on the fixed effect or random effect model. The Hausman test result is presented below:

Table 5: Hausman test output

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	"Chi-Sq. d.f.	Prob.
Cross-section random	3.289791	3	0.3491

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOSC	-0.011609	-0.035021	0.000743	0.3904
LGFC	-0.020168	-0.024970	0.000876	0.8711
LOWMC	-0.073407	-0.345262	0.147935	0.4797"

Source: Eviews 9.1 Output, 2021

From table 5 above, the Hausman test result shows that we cannot reject the null hypothesis which states that random effect test is the most appropriate. Therefore, the fixed effect model has been rejected and the random effect model accepted as the basis for our analyses. The study will therefore base its analyses and findings on the random effect model. To this course, we re-estimate the random effect model thus:

Table 6: Random effect model output

Dependent Variable: LPAT

"Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.84825	4.841216	4.719528	0.0000
LOSC	-0.035021	0.003181	-11.00943	0.0000
LGFC	-0.024970	0.100316	-0.248911	0.8046
LOWMC	-0.345262	0.185529	-1.860961	0.0696
	Effects Specification			
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			0.764500	1.0000
	Weighted Statistics			
R-squared	0.879032			
Adjusted R-squared	0.814778			
F-statistic	8.230000	Durbin-Watson stat		2.008771
Prob(F-statistic)	0.000449			
	Unweighted Statistics			
R-squared	0.079032	Mean dependent var		15.61775
Sum squared resid	24.94742	Durbin-Watson stat		2.008771

Source: Eviews 9.1 Output, 2021

From the random effect model, a one per cent increase in oil spillage cost, gas flaring cost and oil waste management cost results in 3.5 per cent, 2.49 per cent and 34.52 per cent decreases in the profit after tax of oil companies in the upstream sector.

This conforms to economic theories. Considering the individual statistical significance of the respective independent variables, it is only oil spillage cost that is a statistically weighty variable, considering it t-statistics value of 11.009 and its corresponding probability value which is less than 5 per cent.

The R-squared adjusted value of 81.4778 per cent showed that about 81.48 per cent of the changes in profit after tax have been jointly predicted by the independent variables-oil spillage cost, oil waste management cost and gas flaring cost up to 81.48 per cent.

The high implication of the F-statistics value of 8.23 with its corresponding probability less than 5 per cent shows that the high predictability of the model did not occur by chance, it actually shows that the model has a good fit. The result is supported by the findings of Howes (2002), James (1998) and Murphy (2003).

5. DISCUSSION

Findings from this study showed oil spillage cost has adverse but substantial effect on the profit after tax of oil companies in the upstream sector. This implies that the more oil companies expend on spillage related activities, the less their profitability. This is so as higher expenditure has direct consequences on income of the companies. Firms take from their reserves to fund expenditure on oil spillage which cost may involve huge sums, thus impacting adversely on profitability. This finding is supported by Seetharaman (2007), Stead (1992), Watts (1986), and Wycherley (1991), who studied the consequence of environmental accounting on the performance of oil marketers. Using the pooled least square approach, the studies found a significant negative effect of oil spillage cost on the profitability of oil marketers. The study also showed that gas spreading cost and oil waste management cost have adverse but immaterial effect on the profit after tax of oil and gas companies in the upstream sector. This is due to the fact that this cost element impact directly on profitability/yield. To fund gas flaring activities, firm must create provision which in effect reduces profitability because the higher the expenditure on gas spreading activities, the lower the profitability of the oil marketers. This outcome has been sustained and

supported by Effiong & Asuquo (2010) that surveyed environmental accounting and environmental cost reporting: implications and prospects for business survival, Asuquo (2012d) that explored the eco-friendly strategies and their financial effects on corporate performance of selected oil and gas companies in Niger Delta Region of Nigeria, Asuquo, Dan & Effiong (2020b) that investigated the effect of eco-friendly costs on net revenue of cement producing firms, and Andrew (1995), Bassey, Usang & Edom (2013), who studied the "implementation of environmental cost management and its impact on output of oil and gas companies as experience universally. The study employed the ordinary least square technique and found that the implementation of environment cost accountant is substantial in the output of oil and gas companies in Nigeria.

6. CONCLUSION

The exploration focused the impact of green and eco-friendly cost accounting on the performing of oil and gas consortiums in Nigeria. It jointly explored repercussion of cost connection in peace-keeping in the green environment to enable businesses to liberally carry out their activities without disruption within the Niger Delta Region of Nigeria. Consequentially, greater productivity is attained with the resultant economic growth of Nigeria. The case of Niger Delta Outcomes indicated that oil spillage cost has a adverse and substantial influence on the profit after tax of oil consortiums in the upstream sector; gas glaring cost has a adverse and inconsequential influence on the profit after tax of oil consortiums in the upstream sector; oil waste controlling cost has a negative and irrelevant effect on the profit after tax of oil consortiums in the upstream sector (Asuquo, Dickson, Emechebe, & Ebri, 2016). Based on the findings made by this study, it is concluded oil spillage cost lessens considerably the profitability of oil consortiums in Nigeria, while oil waste controlling cost and gas flaring cost reduce inconsequentially the profitability of oil consortiums in Nigeria. Based on these, the study concluded that environmental cost accounting has a negative effect on the profitability of oil consortiums in Nigeria. Having analysed the effect of conservational and green cost accounting on the yield of oil consortiums in Nigeria, the ensuing commendations were made: Oil companies should develop an anti-spillage strategy to enhance the prevention or timely detection of oil spillage to reduce the allocated cost for spillage relate activities and so enhance yield/profitability, Oil consortiums should formulate policies to reduce gas flaring through adequate inspection and monitoring of exploration activities to reduce the allocated cost for gas flaring, and adequate controlling of oil waste should be encouraged and promoted to solidify the crude oil products and enhance yield of oil consortiums in Nigeria.

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