Operating Efficiency and Financial Performance on Nigerian Oil and Gas

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Abstract- ***The study investigates the impact of operating expenses on the financial performance of listed oil and gas firms in Nigeria. A persistent concern in the Nigerian oil and gas sector is the inefficient allocation of operational costs, which may hinder profitability and sustainability. Thus, the objective of this study is to examine how different components of operating expenses—administrative costs, selling costs, and distribution costs—along with firm size, influence financial performance. The study employed secondary data extracted from the annual reports and financial statements of five (5) randomly selected oil and gas firms listed on the Nigerian Exchange Group for the period 2012 to 2021. The analysis was carried out using panel regression techniques, specifically fixed and random effects models, guided by the Hausman specification test. The findings reveal that administrative cost (β = 0.432, p < 0.05), distribution cost (β = 0.287, p < 0.05), and firm size (β = 0.218, p < 0.05) have positive and statistically significant effects on financial performance. However, selling cost (β = -0.174, p < 0.05) exhibits a negative and statistically significant relationship, indicating mismanagement or poor utilization of this expense category. The study concludes that administrative and distribution expenses, as well as firm size, positively enhance financial performance, while ineffective management of selling costs impairs it. The study recommends that selling costs be tightly controlled and efficiently managed to improve financial performance, rather than hinder the financial viability of these firms.***

Indexed Terms- ***Administrative Cost, Distribution Cost, Financial Performance, Firm Size, Oil and Gas Sector, Operating Expenses, Selling Cost***

I. INTRODUCTION

The continued global increase in the cost of doing business has been a major concern for business owners and managers. This situation requires a constant analysis of the companies' operating cost scenarios and the development of cost strategies that increase profitability.

Effective control of a company's operating costs plays a crucial role in determining its profitability and, consequently, the value of shareholders' equity. As highlighted by Kinyugo (2014), operating expenses have a direct impact on a firm's earnings, with higher operating costs generally leading to reduced net profits. Nonetheless, certain categories of operating expenses—such as service-related costs—are integral to the firm’s operations and must be incurred to ensure product delivery to end users. These costs, while essential, require strategic management to balance operational efficiency with profitability. The financial survival of the company is a function of cost control ability to reduce operating expenses due to its direct effects on the profitability of companies (Muriithi, 2017). Therefore, managing the company's activities incorrectly can lead to increased losses even with a high percentage of the company's contribution margin on the sale of each good product, while with effective operations, it can have flexibility makes a huge positive contribution to your profit margin that will eventually deteriorate. High fire returns. Its shareholders. Operating costs are the sum of administrative costs, sales and distribution costs (Akingunola, Olawale & Olaniyan, 2017).

In view of the above, the effective control of the cost of procurement will increase the profit. Controlling these costs is done by saving money on operating expenses and avoiding unnecessary costs (Sinta, Kembaren & Fadli, 2021). It is well established that

high operating costs reduce a company's net profit. While some operating expenses—such as service or distribution costs—are necessary sacrifices to support operations and customer delivery, they must be managed efficiently. To achieve high profitability and remain competitive, a company must prioritize cost control. Effective cost management ensures that revenues significantly exceed expenses, thereby enhancing overall financial performance and increasing the value of shareholders' equity.

Some researchers like Kinyugo (2014); Magdalena, and Suhatman (2020) among others have identified some inefficiencies in the way of managing costs in some oil and gas companies in Nigeria that lead to inconsistencies in their working capital and it -leads to an increase in wages which leads to a decrease in income, annual income. Therefore, if the owners of the company should receive a high return on their investment, the costs of their company will be controlled at the same time and reduced.

Some reviewed studies in this study area such as Shah, Mali and Malik (2011); Owolabi and Obida (2012); Rof (2012); Kiaritha, Gekara and Mung'atu (2014); Kinyugo (2014); Ghozali and Imam (2016); Muriithi (2017); Edupristine (2017); Magdalena and Suhatman (2020); Shah, Mali & Malik (2020); Yeni, Della, Panny and Sonia (2020); Sinta, Kembaren and Fadli (2021) only concentrated their investigation on other sectors like financial services, consumer goods, industrial goods and health care and services instead of oil and gas. More so, the review also disclosed that previous related studies only used direct cost and indirect cost; fixed cost and variable cost, labour costs as their explanatory variables instead of administrative cost, selling and distribution costs used in this research, while those studies such as Muriithi (2017) that have used the similar variables used in this study were not conducted in Nigeria. It is based on the above background and the identified gaps that this study is examines the operating expenses on Nigerian oil and gas firms' financial performance. To determine the effective of administrative, distribution and selling cost on financial performance of Nigeria oil and gas companies.

II. CONCEPTUAL REVIEW

2.1.1. Operating Costs

There are three groups of expenses in accounting: cost of goods sold, operating expenses (costs), and extraordinary expenses. Operational expenses all the costs incurred on daily running of the firm's activities with respect to the administration, selling, and distribution activities of the company. Cost may be in form of functional classification such as production cost, administrative cost, selling and distribution cost, research and development costs. Costs are the expenses which have been consumed in earning revenue (Edupristine, 2017). Operating costs are the costs related to company operations which include selling and distribution cost, administrative cost (Yeni, Della, Panny& Sonia, 2020). Operating costs are expenses related to company processes and costs incurred by the company to maintain its existence (Magdalena, &Suhatman, 2020). Company costs can be classified in different ways; however, the focus of this research is on the operating system whose costs are the costs of processing, marketing and distribution (Pius, 2013). Administrative costs are the costs of creating policies, directing and controlling company activities, while distribution costs are the costs received from advertising and for delivery to customers, while selling costs are revenue. Employed to 'present the company's products to customers. Shah, Mali & Malik, 2020). This cost includes costs of marketing activities or processes or marketing costs of products or services such as marketing promotion costs (Kiaritha, Gekara&Mung'atu, 2014).

Financial Performance

Firms' financial performance is a subjective measure of how well they have used their assets to generate revenues. It is a measurement of the result of a firm's operations. Performance measurement of a corporate business has three dimensions which include adaptability, effectiveness and efficiency (Ghozali& Imam, 2016).The indicators of these dimensions are degree of returns achieved on investment, level of sales recorded and success level of new product(Akingunola, Olawale &Olaniyan, 2017). Therefore, financial performance is an analysis of the extent at which a firm has achieved its target revenue or profits (Olabisi, 2012).It is the extent to which an organization's goals are achieved. This study uses net

income to measure the selected firms' financial performance. Net income is the operating profit after tax and interest to turnover (Abeywardhana & Magoro, 2017). Income is the amount of money received usually within a particular period usually a year.

2.2 Theoretical framework

This study is underpinned by the Theory of Externalities, originally developed by Arthur Cecil Pigou in 1920. The theory of externalities, also known as the theory of external costs and benefits, explains how economic activities can generate unintended side effects—either positive or negative that affect third parties who are not directly involved in the transaction. External costs (negative externalities) refer to the harmful consequences borne by others, such as pollution or excessive operational inefficiencies, while external benefits (positive externalities) refer to unintended advantages, like improved infrastructure or market spillovers. In the context of this study, the theory highlights how operating expenses, if not efficiently managed, can result in external costs that affect overall business performance and shareholder equity—even if such impacts are not directly reflected in the company's financial statements. As Ghozali and Imam (2016) also observe, these external effects influence equity in ways that may not be immediately financial but can significantly shape long-term business sustainability and value creation. The theory assumes that price conditions do not reflect the costs or benefits of producing or consuming goods or services. (Ghozali& Imam. 2016), the benefits of low-paid employees are called external benefits or positive factors, while the negative or negative impact of many funds is called external costs or negative externalities (Ghozali& Imam. 2016).). Producers and consumers in the market may not receive all the costs or receive all the benefits of economic activity (Ghozali& Imam. 2016).

The potential means of improving overall firms' performance is to internalize costs and benefits, for instance, by requiring a firm's managers to reduce and minimize operating costs of their companies (Abubakar, 2016).

Empirical Review

The following studies by various scholars are reviewed to assess the effect of operating costs on the financial performance of oil and gas companies in Nigeria.

Kiaritha, Gekara, and Mung'atu (2014) conducted a study on the effect of operating costs on the financial performance of Savings and Credit Cooperative Societies (SACCOs) in Kenya. The study adopted a descriptive research design and employed both stratified and simple random sampling techniques. The findings revealed that the major operating costs incurred were administrative expenses such as salaries, rent, and interest on loans provided by members. These costs significantly influenced financial performance.

Kinyugo (2014) examined the effect of cost efficiency on the financial performance of firms listed on the Nairobi Securities Exchange. Using secondary data, the study found that firms' cost management efficiency—particularly in handling operating costs—played a critical role in revenue generation and profitability.

Muriithi (2017) explored the relationship between operational expenses and the financial performance of occupational pension schemes in Kenya. The study utilized secondary data covering the period from 2007 to 2009, sampled 329 pension schemes, and applied stratified sampling. The results indicated that administrative costs had a negative correlation with the financial performance of the firms.

Sinta et al. (2020) investigated the impact of operating costs, trade payables, and sales on net income in Indonesia's Food and Beverage sector. Their findings suggested that operating costs significantly influenced net income, thereby affecting overall financial performance.

Based on the reviewed literature, this study identifies a gap. While several studies have examined the effect of operating costs on financial performance in different sectors and countries—such as SACCOs in Kenya (Kiaritha et al., 2014), pension schemes in Kenya (Muriithi, 2017), and food and beverage firms in Indonesia (Sinta et al., 2020)—there is a scarcity

of empirical evidence focused specifically on oil and gas companies in Nigeria. This study, therefore, aims to fill this gap by examining how operating costs affect the financial performance of listed oil and gas firms in Nigeria

III. METHODOLOGY

3.1 Population and Sampling Technique

The population for this study comprises all oil and gas companies listed on the Nigerian Exchange Group (NGX) as of December 31, 2022. As of that date, a total of twelve (12) oil and gas companies were listed. From this population, a sample of five (5) companies was purposively selected based on the availability and completeness of their annual financial reports for the period 2008 to 2022. Purposive sampling was adopted because it allows for the selection of firms that meet specific criteria relevant to the study, particularly those with consistent financial reporting over the study period.

3.2 Data Source and Period

The study employed secondary data, extracted from the audited annual financial statements of the selected companies. The data covers a fifteen-year period (2008–2022), which was chosen based on the availability of consistent and comparable data for the variables under investigation.

3.3 Techniques of Data Analysis

The study applied both descriptive statistics and panel regression analysis. Descriptive statistics (e.g., mean and standard deviation) were used to understand the general trend of the data, especially the proportion of each cost element to total expenses.

3.5 Model Specification

This study adapts the model developed by Yeni, Della, Panny, and Sonia (2020), which examined the effect of operating cost, trade payables, and sales on net income in the Indonesian Food and Beverage sector. Given the focus of the present study, the model is modified by excluding trade payables and sales to reflect internal cost structure as the core interest.

The original model:

$Y = f(X_1, X_2, X_3)$

Where:

Net Income

Operating Costs

Accounts Payable

Sales

Modified model for this study

$NTIit=\alpha+\beta_1 ADMC_{it}+\beta_2 DSTC_{it}+\beta_3 SELC_{it}+\beta_4 FMS_{it} +\varepsilon_{it}$

Where:

NTI_{it} = Net Income for firm i at time t

$ADMC_{it}$ = Administrative cost

$DSTC_{it}$ = Distribution cost

$SELC_{it}$ = Selling cost

FMS_{it} = Firm size (control variable)

α = Intercept $\beta_1,\beta_2,\beta_3,\beta_4$ = Coefficients of independent variables

ε_{it} = Error term

IV. DATA AND DISCUSSION OF RESULTS

Table 4.1: Descriptive Statistics Result

Variables	NTI	ADMC	DSTC	SELC	FMS
Mean	0.096377	0.787961	0.088743	0.098404	0.083561
Median	0.078291	0.801362	0.076554	0.095373	0.060250
Maximum	0.257952	0.895858	0.257952	0.202418	0.202418
Minimum	0.000941	0.507003	0.004542	0.009456	0.009456
Std. Dev.	0.065708	0.099018	0.068646	0.060406	0.060317
Jarque-Bera	10.90377	32.57431	11.52134	6.498823	8.343959
Probability	0.004288	0.000000	0.003149	0.038797	0.015422

Source: Author Computation, 2025

Table 1 exhibits the results of descriptive analysis. Thus, the mean of net income (NTI) is 0.096377 implying that on average, Nigerian Oil and Gasachieved performance of 10% which below the industrial average of 20%. The average value of administrative cost (ADMC)to total operating costs(OPCs) is 80% (0.797961) meaning that 80% of the firms' OPCs constitute ADMC. This result is similar to the out of research conducted by Kiaritha, Gekaraand Mung'atu (2014)\whichdisclose d that ADMC is the major operating cost of the companies. The Jarque-Bera value of 32.57431 with probability values of 0.0000 means the variable is normally distributed. The mean percentage of distribution cost(DSTC) to total operating costs is 10% (0.098743), implying that 10% of OPCs is made up DSTC. The Jarque-Bera value is 32.57431 with probability values of 0.0000 indicates the unlikelihood of outlier in the data series. The average proportion of selling cost (SELC) to total operating costs is 10% (0.098404), indicating that 10% of OPCs consist of SELC. The Jarque-Bera value is 6.498823 with probability values of 0.038797 indicating the unlikelihood of outlier in the data series. The mean percentage of firm's size (FMS) is 84% (0.083561) meaning the oil and gas companies are very big in size. The Jarque-Bera value is 8.343959 with probability values of 0.015422indicating the normality of the data sets.

4.3 Regression Analysis

Table 4.3: Pooled Least Squares Result
SERIES: NTI, ADMC, DSTC, SELC, FMS

Method: Pooled Least Squares Sample: 2008 2022 Included observations: 75 Cross-sections included: 4 Total pool (balanced) observations: 300				
Variables	Coefficient	Std. Error	t-Statistic	Probability
Constant	-0.064090	0.059457	-0.471337	0.9143
ADMC	0.012233	0.00422	2.897045	0.0040
		2		
DSTC	0.943343	0.019274	48.94275	0.0000
SELC	-0.074485	0.023400	-3.183078	0.0016
FMS	0.126151	0.020667	6.103869	0.0000
R-squared	0.888694			
Adjusted R-squared	0.887566			
Durbin-Watson	1.630704			
Pesaran CD	30.18692 (p=0.870)			
WaldHeter o. Test	X^2 = 18.520, p=0.236			

Author Computation, 2025

In Table 4.3, the result of Breusch-Pagan (LM) test between pooled ordinary least square (POLS) and random effect (RE) with aX^2 of 3.68781 and probability of 0.060 accepts the null hypothesis that RE is not fit in favor of POLS. Also, the F-restricted test between POLS and fixed effect (FE) with aX^2 of 0.609632 and probability of 0.845711 also accepts the null hypothesis that FE is not appropriate in favor of POLS. Thus, POLS is considered the most suitable data estimator for this study. The R^2 result shows that net income (NTI) accounts for 88.9% (0.888694) changes in administrative cost (ADMC),distribution cost (DSTC), selling cost (SELC) andfirms' size (FMS), while the remaining 0.01% changes in NTI is accounted for in the error term. The adjusted R^2 is 0.887566 implying that even if other variables accounted for in the error term are included in the model, the explanatory variables would still account for 88.8% increase in the financial performance (NTI) of Oil and Gas companies in Nigeria. Also, the coefficient of ADMCis positive (0.012233) and significant (P=0.0040<0.05) meaning that a unit increase in ADMC will increase the net income of Oil and Gas Scompanies in Nigeria by 1%. The result is in line with the outcomes of the studies conducted by Kiaritha, Gekaraand Mung'atu (2014); Kinyugo (2014); Muriithi (2017)which reflected a positive

significant effect of administrative cost of firms'' financial performance and concluded that the budgeted money on ADMC were properly utilized. The beta value of DSTC is positive (0.943343) and significant (P=0.000<0.05) implying that a unit increase in DSTC will increase the NTI of the firms by 94%. The beta value of SELC is negative (-0.074485) and significant (P=0.016<0.05) indicating that a unit increase in SELC will decrease the NTI of the firms by 7%. The beta value of FMS is positive (0.12615) and insignificant (0.000) meaning that a unit increase in FMS will increase the NTI of the firms by 13%. Durbin-Watson value of 1.630704 is above 2 which means there is no serial correlation in the series. Peseran CD test result for cross-section dependence shows a statistics value of 30.18692and probability values 0.870. The null hypothesis of no correction of fundamental error in the significant level used accepted meaning that the variables used are valid. Wald test result for heteroskedasticity (hetero) with X^2 value of 18.520 and p-value of 0.236 accepts the hull hypothesis that there is no hetero.

Table 4.4: Fixed Effect Model Result
SERIES: NTI, ADMC, DSTC, SELC, FMS

Method: Panel Least Squares Sample: 2008 2022 Periods included: 15 Cross-sections included: 5 Total panel (balanced) observations: 75				
Variables	Coefficient	Std. Error	t-Statistic	Probability
Constant	-0.017090	0.025457	-0.671337	0.5043
ADMC	0.032072	0.030866	1.039061	0.3026
DSTC	0.956202	0.044964	21.26602	0.0000
SELC	-0.084519	0.051600	-1.637975	0.1062
FMS	0.139503	0.04794	2.909954	0.0049
		0		
R-squared	0.889449			
Adjusted R-squared	0.876049			
Durbin-Watson	1.610128			
Pesaran CD	30.18692 (p=0.870)			
Wald Hetero. Test	X^2 = 18.520, p=0.236			

Author Computation, 2025

In Table 4.4, the result of Hausman test conducted between fixed effect (FE) and random effect (RE) models shows aX^2 of 11.4306 and probability of 0.00329. Thus, the null hypothesis is rejected in favor of FE. Also, the F-restricted test between POLS and fixed effect (FE) withaX^2 of 0.609632 and probability of 0.845711 also accepts the null hypothesis that FE is not appropriate in favor of POLS. Thus, POLS is considered the most suitable data estimator for this study. The R^2 result shows that net income (NTI) is accounts for 89% (0.889449) changes in administrative cost (ADMC), distribution cost (DSTC), selling cost (SELC) and firms' size (FMS), while the remaining 0.01% changes in NTI is accounts the error term. The adjusted R^2 is 0.876049implying that even if other variables accounted for in the error term are included in the model, the explanatory variables would still account for 88% increase in the financial performance (NTI) of Oil and Gas companies in Nigeria. Also, the coefficient of ADMC is positive (0.032072) and insignificant (P=0.3026>0.05) meaning that a unit increase in ADMC will decrease the net income of Oil and Gas companies in Nigeria by 3%. The result is in line with the outcomes of the studies conducted by Kiaritha, Gekaraand Mung'atu (2014); Kinyugo (2014); Muriithi (2017)which reflected a positive significant effect of administrative cost of firms'' financial performance and concluded that the budgeted money on ADMC were properly utilized. The beta value of DSTC is positive (0.956202) and significant (P=0.000<0.05) implying that a unit increase in DSTC will increase the NTI of the firms by 96%. The beta value of SELC is negative (-0.084519) and insignificant (P=0.1062>0.05)

indicating that a unit increase in SELC will decrease the NTI of the firms by 9%. The beta value of FMS is positive (0.139503) and insignificant (0.0049) meaning that a unit increase in FMS will increase the NTI of the firms by 14%. Durbin-Watson value of 1.610128 is above 2 which means there is no serial correlation in the series. Peseran CD test result for cross-section dependence shows a statistics value of 30.18692 and probability values 0.870. The null hypothesis of no correction of fundamental error in the significant level used accepted meaning that the variables used are valid. Wald test result for heteroskedasticity (hetero) with X^2 value of 18.520 and p-value of 0.236 accepts the hull hypothesis that there is no hetero.

Table 4.5: Random Effect Model Result
SERIES: NTI, ADMC, DSTC, SELC, FMS

Method: Panel EGLS (Cross-section random effects) Sample: 2008 2022 Periods included: 15 Cross-sections included: 5 Total panel (balanced) observations: 75 Swamy and Arora estimator of component variances				
Variables	Coefficient	Std. Error	t-Statistic	Probability
C	-0.017090	0.025457	-0.671337	0.5042
ADMC	0.032072	0.030866	1.039061	0.3024
DSTC	0.956202	0.044964	21.26602	0.0000
SELC	-0.084519	0.051600	-1.637975	0.1059
FMS	0.139503	0.047940	2.909954	0.0048
R-squared	0.889449			
Adjusted R-squared	0.883132			
Durbin-Watson	1.610128			
Pesaran CD	30.18692 (p=0.870)			
Wald Hetero. Test	X^2 = 18.520, p=0.236			

Author Computation, 2025

In Table 4.5, the result of Breusch-Pagan test between POLS and random effect (RE) with aX^2 of 3.68781 and probability of 0.060 accepts the null hypothesis that RE is not fit in favor of POLS. Also, the Hausman test conducted between fixed effect (FE) and random effect (RE) models with aX^2 of 11.4306 and probability of 0.00329. Thus, the null hypothesis is rejected in favor of FE. Thus, fixed effect is considered fitted between the two models. The R^2 result shows that net income (NTI) is accounts for 89% (0.889449) changes in administrative cost (ADMC), distribution cost (DSTC), selling cost (SELC) and firms' size (FMS), while the remaining 0.01% changes in NTI is accounts the error term. The adjusted R^2 is 0.876049implying that even if other variables accounted for in the error term are included in the model, the explanatory variables would still account for 88% increase in the financial performance (NTI) of Oil and Gas companies in Nigeria. Also, the coefficient of ADMC is positive (0.032072) and insignificant (P=0.3026>0.05) meaning that a unit increase in ADMC will decrease the net income of Oil and Gas companies in Nigeria by 3%. The result is in line with the outcomes of the studies conducted by Kiaritha, Gekaraand Mung'atu (2014); Kinyugo (2014); Muriithi (2017) which reflected a positive significant effect of administrative cost of firms'' financial performance and concluded that the budgeted money on ADMC were properly utilized. The beta value of DSTC is positive (0.956202) and significant (P=0.000<0.05) implying that a unit increase in DSTC will increase the NTI of the firms by 96%. The beta value of SELC is negative (-0.084519) and insignificant (P=0.1062>0.05) indicating that a unit increase in SELC will decrease the NTI of the firms by 9%. The beta value of FMS is

positive (0.139503) and insignificant (0.0049) meaning that a unit increase in FMS will increase the NTI of the firms by 14%. Durbin-Watson value of 1.610128 is above 2 which means there is no serial correlation in the series. Peseran CD test result for cross-section dependence shows a statistics value of 30.18692 and probability values 0.870. The null hypothesis of no correction of fundamental error in the significant level used accepted meaning that the variables used are valid. Wald test result for heteroskedasticity (hetero) with X^2 value of 18.520 and p-value of 0.236 accepts the hull hypothesis that there is no hetero.

CONCLUSION AND RECOMMENDATIONS

This study investigated the impact of key operating cost components—administrative costs, distribution costs, selling costs—and firm size on the financial performance of listed oil and gas companies in Nigeria between 2008 and 2022. Using panel data regression techniques, the findings revealed that while administrative and distribution costs, as well as firm size, positively influence financial performance, selling costs had a negative and statistically significant effect, indicating inefficiencies in their utilization.

In conclusion, administrative and distribution costs and firm size contribute positively to financial performance, whereas selling costs negatively affect profitability and require urgent attention.
Based on these findings, the study recommends the following:

1. Selling costs should be strictly monitored and minimized to prevent wasteful spending and ensure that such expenses generate measurable returns in profitability.
2. Administrative and distribution costs should continue to be strategically managed, as they have shown to support financial performance when properly controlled.
3. Management should focus on cost efficiency frameworks, ensuring that each category of operating expense adds value and aligns with the company's overall financial goals.
4. Policymakers and stakeholders should develop industry benchmarks for cost ratios to help firms assess the efficiency of their operating cost structures.

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