

## ANALYSIS OF THE EFFECT OF SALES GROWTH AND MANAGERIAL EFFICIENCY ON THE PROFITABILITY OF HEALTH CARE FIRM IN NIGERIA

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### **Abstract**

*The study investigated the effect of sales growth, managerial efficiency and size on the profitability of healthcare firms in Nigeria by using the data of five (5) healthcare sampled firms obtained from 2007-2021 which was extracted from their annual reports and accounts. The study uses panel data regression technique for data analysis and the outcome suggests that sales growth and size variables have strong and significant effect on the profitability of the health care firms. However, managerial efficiency was found to have no significant effect on the health care firms' profitability. The result suggests that size of firms and increased revenue will impact positively on their profitability but efficiency in management of resources in isolation has no significant impact on their profit. The study recommends that health care firm in this sector should continue to focus attention on sales growth potential and through improved revenue, and expansion of size, through assets base and efficient resource utilization.*

**Keywords:** Profitability, sales growth, efficiency, size, healthcare firms, Nigeria

### **1. Introduction**

Profitability has been the focus of attention of various scholars and business community. It is the primary concern and rallying point of all stakeholders within an organization and it is one of the indices of performance measurements of an organization. The health status of an organization is determined by profitability and its financial performance, therefore if financial performance is relatively good; it shows the effectiveness of the management in the judicious utilization of resources at their disposal (Niresh & Velnampy, 2014). Organizations grow and expand their business through attainment of higher profitability and sound financial performance. Some of the factors that could affect profitability and financial performance include size, age, leverage, sales, liquidity, volume of earnings and many others. These key attributes have been used in various studies to determine their contribution and impact in achieving higher profitability and better financial performance. Health care sector in Nigeria has continued to attract attention in view of its prominence in the Nigerian economy; it has contributed about 3.03 to the GDP of the Nigerian economy as at 2019. But this plummeted to 0.7% in 2021 due to the devastating effect of COVID 19 syndrome in 2020/2021.

Growth in sales is a key factor that determines the survival of a business. Firms excel through large volume of sales revenue and the determination of a firm to grow its sales will reflect in the overall profitability. The performance of a firm could therefore be reflected through growth in sales revenue as the level of sales growth is a crucial determinant of

profitability and financial performance (Abdulsalam & Babangida 2017). Efficiency is the ability of management to improve all indices of performance through proper utilization of resources at her disposal. A firm is efficient when it is able to pool resources to achieve a mission with minimum cost and when efficiency is deployed to manage resources; it guides the management to achieve results in terms of productivity, liquidity management, debt management and profitability (Ongore, 2011).

Size reflects capacity and capability to deliver and it is achieved through growth and expansion over time. The size of a firm is a primary factor in determining the profitability of a firm due to the concept of economies of scale (Niresh & Velnampy, 2014). Size could be determined by assets, sales volume and number of employees which are also some of the determinants of profitability. These issues are very fundamental and key attributes of financial performance.

Literature that focused on some of these attributes on financial performance include Onyekwelu, Nweije and Ugwu (2017), who looked at the effect of firm characteristics on financial performance of oil & gas companies in Nigeria using sales growth and financial leverage as indices of firm characteristics while ROA representing the financial performance. Matar and Eneizan (2018) also assessed the determinants of financial performance of Jordanian manufacturing firms from 2005-2015 using ROA as the dependent variable and leverage (LV), liquidity (LQ), firm size (FS), profitability (PR) and revenues (RV) as the proxies of the independent variable. Others are Odalo, Njuguna and Achoki (2016) who investigated sales growth and financial performance of Agricultural firms in Kenya for 2003-2013, and John and Adebayo (2013) who examined the effect of firm size on the profitability of Nigerian manufacturing sector for the period of 2005-2012. The inconsistency identified in the outcomes of these studies, the disparity in period of studies and measurement of variables coupled with the need to continue to examine the consequences of these variables on the different sectors of the economy necessitated continued research to fill these gaps. This study intends to investigate the effect of sales growth on the profitability of health care firm in Nigeria and whether size and efficiency in management of resources have positive impact on their profitability performance.

## **2. Literature Review & Theoretical framework**

This section presents the conceptual and literature review as well as the theory that underpins the study.

### **2.1 Conceptual Framework**

#### **2.1.1 Concepts of Firm Characteristics**

Firm characteristics are those variables that affect the firm's decision both internally and externally. The internal variables are mostly under the direct control of management while external factors are beyond the control of management. Malik (2011) identified the internal characteristics variables to include size, leverage, liquidity, growth, and tangibility of asset. Whereas the external variables on the other hand include natural disasters, political instability, energy crises and terrorism (Sumaira & Amjad, 2013).

### 2.1.2 Concepts of Financial Performance

Profitability is the state or condition of yielding a financial profit or gain and it is the primary goal of all business ventures. Without profitability the business will not survive in the long run. Measuring current and past profitability and projecting future profitability is very important. Profitability is measured as the differences between revenue and expenses and it is usually reflected through the financial performance.

Financial performance is related to how the operating efficiency of a firm is measured. It is a yardstick applied to measure the financial health of a firm over a given period of time. It is also described as a measure of firm policies and operations in monetary terms (Malik, 2011). Various proxies could be used to measure profitability ratios; the most common include return on assets (ROA), return on equity (ROE), net profit margin (NPM) (Aggarwal, 2013). Other scholars suggested measures such as earnings per share, Dividend yield, price earning ration, return on sales, returns on investment and return on capital employed (ROCE) (Farouk & Shehu, 2012, 2013, & Mohammed & Usman, 2016).

## 2.2 Review of Theories

Theoretical framework is described by Abdulsalam, Abdulrahman, Garba, Mohammed and Abubakar (2020) as a system of network of a set of preposition, facts and assumptions that could be used to explain certain phenomenon. Based on this, institutional theory is adopted to underpin this study. Institutional theories emphasized that organizations are influenced by normative pressures arising from both external sources and from within the organization itself. These pressures lead organization to be guided by legitimated elements from standard operating procedures to professional certification and requirements of law. Adopting the legitimated elements increases the possibility of the firms' survival (Zucker, 1987). Based on this theory, firms could expand in size and experience growth arising from external factors such as market environment, Research & development, and technological advancement. This theory is linked to this study in view of its relationship with growth of firm through adoption of standard procedure which leads to efficiency, growth through expansion of size and sales and technological advancement.

## 2.3 Review of Empirical Literature

A review of the relevant literature came up with conflicting opinions. Odalo *et.al* (2016) investigated sales growth and financial performance of Agricultural firms in Kenya from 2003-2013. Sales growth was estimated using percentage increase in sales growth while financial performance was proxy by ROA, ROE & EPS. The result found sales growth to have positive and significant effect on ROA & ROE but negative and insignificant effect on EPS. However, the study focused on the agricultural sector with only one independent variable (sales growth). The result could be different using multiple firm characteristics. Other measures of financial performance such as Tobins-Q, net profit margin could also come up with different outcome.

In contrary, Onyekwelu *et.al* (2017) who assessed the effect of firm characteristics on financial performance of oil & gas companies in Nigeria using multiple independent variables of sales growth and financial leverage as indices of firm characteristics found negative and insignificant effect of sales growth on financial performance proxy by ROA. Notwithstanding, the outcome can change if the same study was conducted in other sectors of the economy or an alternative measure of financial performance was adopted.

Managerial and operational efficiency also play a significant role in profitability and financial performance. Jakada and Aliyu, (2019) examined the impact of managerial efficiency on the performance of nine (9) Multinational corporations in Nigeria for a period of 15 years (1995-2009) and findings indicate a significant positive relationship between managerial efficiency and performance represented by return on assets. However, the findings focused on only 9 multinational companies operating in Nigeria in the midst of many, and data generation was limited to their branches in Nigeria. The same outcome was observed in Ongore (2011) who examined the determinants of financial performance of commercial Banks in Kenya using secondary data of the 37 commercial Banks from 2001 to 2010. The relationship between managerial efficiency and performance represented by ROA and ROE was found to be positive though the study focused on the banking sector. However, Musa, Kong and Mensah, (2019) studied operational efficiency and financial performance of non-financial firms listed on Ghana stock exchange and found negative association between operational efficiency and ROA and an insignificant inverse association with ROE and ROCE. The study was limited to non-financial firms and used the traditional measures of financial performance like most of the studies reviewed.

Looking at the effect of firm size, John and Adebayo, (2013) examined Nigerian manufacturing sector during the period of 2005-2012 by looking at the effect of firm size on profitability. Return on assets (ROA) was used as a proxy of profitability while log of total assets and log of turnover were used as proxies of firm size. Results revealed that firm size, both in terms of total assets and in terms of total sales, positively affected the profitability of Nigerian manufacturing companies. But the outcome was different from the findings of Niresh and Velnampy, (2014) who employed data of 15 companies from Colombo Stock Exchange (CSE) between the years 2008 and 2012. Return on assets and Net profit margin were used to proxy profitability whereas log of total assets and log of total sales were indicators of firm size. The result indicated a negative relationship between size and profitability. Similar result was obtained by Olawale, Bamidele, and Lawal (2017) who also found negative relationship between size in term of total assests and financial performance on 12 non-financial firms in Nigeria. Literature reviewed generally indicates varied results on the variables in contention, and this gave further impetus to this study to in order to bridge the gap.

## Methodology

### 3.1 Research Design

The paper adopts correlational research design because it explains the relationship between the variables of the study. The study uses panel regression model to analyze the data. Descriptive statistics were used to describe the data while inferential statistics (regression and correlation analysis) were used to draw inferences of the study. The panel data was analyzed using STATA 15 software.

### 3.2 Population of the study

The population of this study covers the ten (10) health care firms listed on the floor of the Nigerian Stock Exchange (NSE).

### 3.3 Sample Size and Technique

Purposive sampling method was adopted in selecting the sample size, this is in order to eliminate the deficiency in firms that have no adequate and comprehensive data. For the purpose of this study, five (5) companies out of the ten (10) listed firms, in order to test the samples and generalize the results obtained for the entire population (see appendix 1) attached. This sample size is considered adequate as it represents 50% of the population.

### 3.4 Source of Data

Secondary data was extracted manually from the published annual reports of the sampled companies for 15 years 2007-2021.

### 3.5 Variables Description and Measurements

S/N	Variable	Proxy	Acronym	Measurement
1	Dependent – Profitability	Net Profit Margin	npm	Net Incomex 100 Total Revenue
2	Independent Variables	Sales Growth	slg	Percentage increase in Total Revenue
3		Managerial efficiency	meff	Total Revenue Total Assets
4		Firm Size	size	Log of Total Assets
5	Control variables	Liquidity	liq	Current Assets Current Liabilities
6		Age	age	No of years since incorporation

### 3.6 Model Specification

Model specification for this study is derived from the research efforts of previous contributors in this area of study which include(Onyekwelu *et.al* 2017).

$$npm_{it} = \beta_0 + \beta_1slg_{it} + \beta_2meff_{it} + \beta_3size_{it} + \beta_4liq_{it} + \beta_5age_{it} + \mu_{it}$$

Where;

- npm = Net Profit Margin
- slg = Sales Growth
- meff = Managerial efficiency
- size = Firm Size
- liq = Liquidity
- age = Age
- $\beta_0$  = Intercept/constant;
- $\beta_1, \beta_2, \beta_3$  = Parameters;
- $\mu$  = the residual/error term
- it* = Panel data

### 4.0 Results and Discussions

In this section, we present the empirical results and discuss the effects of the independent variables on the dependent variable.

**Table 4.1: Descriptive statistics**

Variables	Obs	Mean	Std Dev.	Min	Max
Npm	75	1.8685	13.5104	-57.55	44.48
Slg	75	5.7170	27.3321	-111.28	68.86
Meff	75	63.3296	35.3594	0.21	137.96
Size	75	6.8099	0.4241	5.9144	7.7959
Liq	75	1.7398	3.2600	0.23	28.87
Age	75	46	17.2697	12	76

Source: Author's Computation, Stata 15

The descriptive statistics in table 4.1 above shows the result for the mean, standard deviation, minimum and maximum of the variables of the study. The mean of npm of Healthcare firms in Nigeria is 1.86 and standard deviation of 13.51 which suggests that there is high level of variability in the profitability of the health care firms in Nigeria. Minimum of

-57.55 indicated that some companies actually made losses in some periods. Among the explanatory variables managerial efficiency has the highest standard deviation of 35.35 with a mean value of 63.3 which explains high volatility within the dataset. Sales growth has standard deviation of 27.33 and a mean average of 5.7, minimum of -111.28 and maximum of 68.86. The mean value indicates that sales revenue of the health care industry has witnessed an average growth of 5.7% The mean of size which is measured by the natural log of total assets is 6.80 and standard deviation of 0.42, minimum of 5.91 and a maximum of 7.79 which indicates a disperse level of firm sizes during the study period. The age of firms ranges between 12 and 76 years with a mean of 46 years.

**Table 4.2: Results Correlation Analysis**

	<b>Npm</b>	<b>slg</b>	<b>meff</b>	<b>size</b>	<b>liq</b>	<b>age</b>	<b>vif</b>	<b>Tolerance</b>
npm	1.0000							
slg	0.4612	1.0000					1.07	.931854
meff	0.1778	0.0972	1.000				1.06	.939584
size	0.4668	0.1226	0.0505	1.0000			1.06	.942719
liq	-0.0321	0.0899	-0.2096	-0.0942	1.0000		1.06	.943113
age	-0.1167	-0.1282	-0.0832	-0.1985	0.0697	1.0000	1.05	.950600

*Source: Author's Computation, Stata 15*

Table 4. 2 present the correlation matrix between the dependent variable, net profit margin (npm) and the explanatory variables. There is a significant moderate relationship between npm, and sales growth slg) at 0.46 and between npm and firm size (size) at 0.46. This is an indication that profitability (npm) of health care firms is influenced by sales growth (slg) and firm size (size). However, the relationship between the net profit margin (npm) and managerial efficiency is weak at 0.17. The relationship with the control variables of liquidity (liq) and age (age) is completely negative. The association between the independent variables are weak as the figures are within the range of 0.8 which suggests that multicollinearity does not exist (Gujerati, Porter, & Gunasekar, 2012). This is further attested by the result of tolerance and vif values as shown on table 4.2 which are less than 1 and 10 respectively.



**Table 4.3: Result of the Regression Analysis**

Model (npm)	coef.	Z stat	P value
(Constant)	-93.42508	-4.25	0.000
Slg	0.19906	4.20	0.000
meff	-0.4532	1.23	0.218
size	13.264	4.33	0.000
Liq	-0.02575	-0.06	0.949
Age	0.02179	0.29	0.772
Mean vif			
R2	0.2153		
Adjusted R2	0.3981		
F Statistics	45.64		
F Significance	0.000		

Note: Predictors: *slg,meff, size, liq& age.*

Author’s Computation, Stata 15

Table 4.3 above shows that sales growth has a coefficient of ( $\beta_0=-0.199$ ,  $P<0.01$ ), and a z value of 4.20 which is significant at 1%. This indicates a positive association between sales growth and net profit margin (npm). Therefore, for every percentage increase in sales growth, the margin of net profit will increase by ₦4.20. The result provides evidence of rejecting hypothesis 1 of the study which states that sales growth has no significant effect on the profitability of Healthcare firms in Nigeria. This finding is in line with the findings of Odaloet.al (2016) but not in agreement with (Onyekwelu.al 2017).

Managerial efficiency reports coefficient value of ( $\beta_0=-0.453$ ,  $P>0.1$ ) and a z value of 1.23 which is insignificant. This signifies that efficiency in resource management has no significant effect on the net profit margin (npm) of healthcare firms in Nigeria. The outcome provides evidence to accept hypothesis two (2) which suggest that managerial efficiency has no significant effect on the profitability of healthcare firms in Nigeria. This is in line with the findings of Muturi et.al (2017), & Musa et.al (2019) but contrary to (Ongore 2011, and Jakada & Aliyu 2015).

The table also shows firm size has a coefficient value of ( $\beta_0=-13.264$ ,  $P<0.01$ ), and a z value of 4.33 which is significant at 1%. This implies a strong and positive association between size and net profit margin (npm). Thus, for every unit increase in size (log of total assets), the net profit margin of the selected healthcare firms will increase by ₦4.33 holding all other variables constant. The result provides evidence of rejecting hypothesis three (3) of the study which states that firm size has no significant effect on the performance of healthcare firms in Nigeria. The findings concur with John and Adebayo (2013)who found evidence that size has positive impact on the financial performance, but contradict the result of (Niresh & Velnampy, 2014&Olawale et.al2017).



The summary table on the regression analysis indicated that the R-squared which expressed the proportion of variation in the net profit margin accounted for by the overall predictors included in the model was 21.53% while the adjusted R-squared was 39.81%. This means that the explanatory variables together can explain 39.8% variations in the profitability of healthcare firms in Nigeria.

The F-value indicated significant fitness of the model at 1% ( $P < 0.01$ ), as the p-value is less than 0.05 level. The tolerance level and Variance Inflation Factor that explained the extent of multicollinearity were below 1 and 10% respectively. They are therefore within tolerable limits.

## **5.0 Conclusion and Recommendation**

The intent of this study is to identify the effect of sales growth, managerial efficiency and size in relation to the profitability of healthcare firms in Nigeria which is proxy by net profit margin during the period 2007 – 2021.

The result indicates a strong and significant positive relationship between the predictor variables of sales growth, and size in relation to the profitability of the healthcare firms in Nigeria, but in the contrary, managerial efficiency has insignificant relationship. Our findings on sales growth agreed with most of the existing literature which suggest that increase in sales growth as one of the indicators of firm growth could lead to the rapid growth which could eventually result to higher profitability and improved performance. The positive association between sales growth and net profit margin is therefore an indication that revenue and size of assets are key elements in determining the financial performance of healthcare firms in Nigeria. The outcome on firm size is in line with conventional economic theory which advocates that larger firms achieve higher returns and can be more efficient compared to smaller firms because they have more experience, skills and abilities. The insignificant relationship between managerial efficiency and net profit margin indicates that efficiency in utilization of resources at the disposal of management does not in isolation results to increased profitability without the support of other key factors. The study recommends that firms in this sector should continue to focus attention and sustain their growth potential and profitability through improved revenue and sales drive opportunities in addition to expand their size through assets base and be more efficient in management of resources.

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APPENDIX 1 (Sampled Firms)

1. Glaxo Smithkline Nig. Plc.
2. May & Baker Nig. Plc.
3. Pharma-Deko Plc.
4. Neimeith Pharmaceuticals Plc.
5. Fidson Nig. Plc.

APPENDIX 2 (Statistical and Regression Results)

```
. xtset id year, yearly
      panel variable: id (strongly balanced)
      time variable: year, 2007 to 2021
      delta: 1 year
```

```
. su npm slg meff size liq age
```

Variable	Obs	Mean	Std. Dev.	Min	Max
npm	75	1.868533	13.51048	-57.55	44.48
slg	75	5.717067	27.33217	-111.28	68.86
meff	75	63.3296	35.35947	.21	137.96
size	75	6.809984	.4241164	5.914407	7.795901
liq	75	1.739867	3.260052	.23	28.87
age	75	46	17.26972	12	76

```
. pwcorr npm slg meff size liq age
```

	npm	slg	meff	size	liq	age
npm	1.0000					
slg	0.4612	1.0000				
meff	0.1778	0.0972	1.0000			
size	0.4668	0.1226	0.0505	1.0000		
liq	-0.0321	0.0899	-0.2096	-0.0942	1.0000	
age	-0.1167	-0.1282	-0.0832	-0.1985	0.0697	1.0000

. reg npm slg meff size liq age

Source	SS	df	MS	Number of obs =	75
Model	5377.69298	5	1075.5386	F( 5, 69) =	9.13
Residual	8129.76087	69	117.822621	Prob > F =	0.0000
Total	13507.4539	74	182.53316	R-squared =	0.3981
				Adj R-squared =	0.3545
				Root MSE =	10.855

npm	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slg	.1990633	.0473506	4.20	0.000	.1046015	.2935252
meff	.0453213	.036815	1.23	0.222	-.0281227	.1187652
size	13.264	3.064237	4.33	0.000	7.151016	19.37699
liq	-.0257564	.400959	-0.06	0.949	-.8256478	.7741349
age	.0217946	.075237	0.29	0.773	-.128299	.1718883
_cons	-93.42508	21.97246	-4.25	0.000	-137.2589	-49.59123

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of npm

chi2(1) = 34.73

Prob > chi2 = 0.0000

. vif

Variable	VIF	1/VIF
liq	1.07	0.931854
meff	1.06	0.939584
size	1.06	0.942719
age	1.06	0.943113
slg	1.05	0.950600
Mean VIF	1.06	

. xtreg npm slg meff size liq age, fe

```

Fixed-effects (within) regression      Number of obs   =       75
Group variable: id                   Number of groups =        5

R-sq:  within = 0.2193                Obs per group: min =       15
      between = 0.7834                avg =           15.0
      overall  = 0.3428                max =           15

corr(u_i, Xb) = -0.4809                F(5, 65)       =       3.65
                                           Prob > F       =       0.0057
    
```

npm	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slg	.1965991	.0504487	3.90	0.000	.0958461	.2973521
meff	.0272557	.052217	0.52	0.603	-.0770289	.1315403
size	13.41108	11.24153	1.19	0.237	-9.039798	35.86196
liq	-.010625	.421199	-0.03	0.980	-.8518175	.8305675
age	-.1894876	.4736325	-0.40	0.690	-1.135397	.7564219
_cons	-83.57587	66.35086	-1.26	0.212	-216.0877	48.93595
sigma_u	4.1677689					
sigma_e	11.146826					
rho	.12265252	(fraction of variance due to u_i)				

F test that all u\_i=0: F(4, 65) = 0.13 Prob > F = 0.9720

. est store fixed

. xtreg npm slg meff size liq age, re

```

Random-effects GLS regression      Number of obs   =       75
Group variable: id                 Number of groups =        5

R-sq:  within = 0.2153                Obs per group: min =       15
      between = 0.9970                avg =           15.0
      overall  = 0.3981                max =           15

corr(u_i, X) = 0 (assumed)           Wald chi2(5)   =       45.64
                                           Prob > chi2    =       0.0000
    
```

npm	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
slg	.1990633	.0473506	4.20	0.000	.1062579	.2918688
meff	.0453213	.036815	1.23	0.218	-.0268349	.1174774
size	13.264	3.064237	4.33	0.000	7.258208	19.2698
liq	-.0257564	.400959	-0.06	0.949	-.8116217	.7601088
age	.0217946	.075237	0.29	0.772	-.1256671	.1692564
_cons	-93.42508	21.97246	-4.25	0.000	-136.4903	-50.35986
sigma_u	0					
sigma_e	11.146826					
rho	0	(fraction of variance due to u_i)				

. est store random

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

$$\text{npm}[\text{id}, \text{t}] = \text{Xb} + \text{u}[\text{id}] + \text{e}[\text{id}, \text{t}]$$

Estimated results:

	Var	sd = sqrt(Var)
npm	182.5332	13.51048
e	124.2517	11.14683
u	0	0

Test: Var(u) = 0

chibar2(01) = 0.00  
Prob > chibar2 = 1.0000

. hausman fixed random

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
slg	.1965991	.1990633	-.0024642	.0174067
meff	.0272557	.0453213	-.0180655	.0370307
size	13.41108	13.264	.1470803	10.81584
liq	-.010625	-.0257564	.0151315	.128998
age	-.1894876	.0217946	-.2112822	.4676186

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
= 0.40  
Prob>chi2 = 0.9952