



RESEARCH ARTICLE

Influence of Productivity on Firm Value of Oil and Gas Firms in Nigeria

¹Okoye, Stephen Ifeanyi, ²Prof. Okwo, Mary Ifeoma and ³Ugwu, Kevin Okoh^{1,2,3}Department of Accountancy, Enugu State University of Science and Technology***Corresponding Author: Okoye, S. I.** | Department of Accountancy Faculty of Management Sciences, Enugu State University of Science and Technology

ABSTRACT

This study examined the influence of productivity on the firm value of oil and gas firms in Nigeria. The specific objectives were to: Ascertain the influence of sales growth, analyze the influence of sales per employee on the net assets and appraise the influence of assets turnover on the net assets of listed oil and gas firms in Nigeria. The study adopted an ex-post facto research design. The source of data for the study was secondary. Multiple Regression Analysis and t-Statistics were used to analyze the data collected and to test the null hypothesis formulated for the study. The result revealed that Sales Growth (LogSLG) is significant at a 0.05 level of significance ($0.05 > 0.0000$), the value of Sales Per Employee (LogSPE) is significant at a 0.05 level of significance ($0.05 > 0.0098$), and value of Assets Turnover (AST) is not significant at a 0.05 level of significance ($0.05 < 0.2417$). We conclude that the independent variables (sales growth, sales per employee, and assets turnover) of the study adequately explained the dependent variable (net assets value). We recommend that oil and gas firm managers in Nigeria should improve their firm value by growing the sales of the firms. In light of the current excess crude oil production and the crash in the international oil price, oil and gas sales can only be increased through high-quality products and cordial business relationships with customers.

Keywords: Firm Value; Oil & Gas Firms; Productivity; Sales Growth; Sales per Employee

Introduction

In today's global and competitive business environment, managers are increasingly under pressure to enhance their firm value by improving the productivity of their companies. Thus, productivity and firm values are important concepts and measures describing the success of an organization. Productivity is a measure of the efficient utilization of organizational resources which shows the efficiency with which inputs are converted to useful outputs (Nguyen, Nguyen, Ngo, & Nguyen, 2019). On the other hand, firm value also known as the market value of the firm is the firm's performance which is the reflection of the public's assessment of the firm's performance through the stock market price of the firm. It is a measure of the success of a firm's management in past operations and future prospects to convince shareholders to invest in the firm (Wahyud, 2020).

Abdullah (2014) states that productivity is a comprehensive measure of a firm's performance. Whereas other accounting n show the value created for firm investors only, productivity measures assess the firm's overall economic contribution. In other words, it shows the total economic value created by the capital and labor employed. Therefore, improved productivity leads to additional value and

economic wealth that eventually benefit not only shareholders but also employees, customers and other stakeholders of the firm. Despite its usefulness and accuracy, productivity has been rarely used in the assessments of the firm performance because accountants' main focus is the profit rather than productivity of firms. Zhang (2005) also asserts that firm-level productivity plays a crucial role in explaining the relation between stock returns (firm value) and firm characteristics, such as the book-to-market ratio. Syverson (2011) equally says that productivity is efficiency in production, which measures how much output is obtained from a given set of inputs such as labour, material and capital.

Previous empirical studies identified some productivity measures that could influence firm value. For instance, Agiomirgianakis, Magoutas & Sfakianakis (2013) in their study of Greek manufacturing firms identified employee productivity, firm size and firm age. Abdullah (2014) also states that labor productivity, capital productivity, and multi-factor productivity affect firms value. Labor productivity is the ratio of output per unit of labor input. Capital productivity is the ratio of output per unit of the capital input. Multi-factor productivity measures the changes in output level net of the changes in all inputs that are combination of labor, materials and capital productivity. This

Citation: Okoye, S. I.; Okwo, M. I.; & Ugwu, K. O. (2022). Influence of Productivity on Firm Value of Oil and Gas Firms in Nigeria, *European Review in Accounting and Finance*, 6(2), 26-37. DOI: <https://doi.org/10.5281/zenodo.7549679>

Accepted: November 14, 2022; **Published:** November 17, 2022

Copyright: © 2022 The Authors. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

study, however, examined sales growth, sales per employee and assets per employee to determine their influence on firm value of oil and gas firms operating in Nigeria.

Statement of the Problem

Given the increasing pressure put on firm managers by business owners, vital business decisions have to be made in order to accomplish the main business goals of profit maximization and wealth creation for the owners of firm capital. Behind any successful business is productivity which is the efficient conversion of inputs consisting of labor, capital, and material into the desired output. Firm productivity is the driving force that produces good financial results, without which the financial performance indicators will turn into negatives.

Despite the importance of productivity management to business success, Nigerian firm managers concern themselves more with financial performance indicators in making vital business decisions. The implication is that business decisions are made based on business symptoms rather than the root cause of business problems. In production-intensive organizations like oil and gas firms, any business decisions that are solely based on financial performance variable without recourse to productivity variables such as sales growth, sales per employee and assets turnover will in the long run affect the performance of the organization. Such faulty business decisions have led to the poor productivity and poor financial performance and eventual extinction of some oil and gas firms in Nigeria. It is in view of this that the current study examined the influence of productivity on firm value of oil and gas firms in Nigeria.

Objectives of the study

The main objective of the study is to examine the influence of productivity on firm value of oil and gas firms in Nigeria. The specific objectives of this study are to;

- I. Ascertain the influence of sales growth on net assets of listed oil and gas firms in Nigeria.
- II. Analyze the influence of sales per employee on net assets of listed oil and gas firms in Nigeria.
- III. Appraise the influence of assets turnover on net assets of listed oil and gas firms in Nigeria.

Statement of the Hypotheses

The following null hypotheses were formulated for the purpose of this study;

- I. Sales growth does not significantly influence net assets of listed oil and gas firms in Nigeria.
- II. Sales per employee does not significantly influence net assets of listed oil and gas firms in Nigeria.
- III. Asset's turnover does not significantly influence net assets of listed oil and gas firms in Nigeria.

Review of Related Literature

Conceptual Review

Firm Productivity

Suman (2021) defines production as a process of combining various inputs to produce an output for consumption. It is the act of creating output in the form of a commodity or a service which contributes to the utility of individuals. It is the organized activity of transforming resources into finished products in the form of goods and services; the objective of production is to satisfy the demand for such transformed resources. Jahchan (2017) also describes productivity as the efficient use of resources, labour, capital, land, materials, energy, information, in the production of various goods and services. Higher productivity means accomplishing more with the same number of resources or achieving higher output in terms of volume and quality from the same input. Productivity is usually expressed as $\text{output/ Input} = \text{productivity}$. Suganya (2011) states that firm productivity can be improved through training and manpower development. In particular, this can be achieved by, providing incentives and appraisals to employees, enhancing discipline measures in the work place, identifying the skills of each employee, giving appropriate feedback to the employees without discouraging them, emphasizing on the positive points to develop productive work and providing continuous training to the employees on multidimensional work. Behnam (2014) also asserts that firms can improve and enhance employee's performance and productivity by providing training and development. Investments in training employees in problem solving, decision-making, teamwork and interpersonal relations result is beneficial to firm level outcome.

Kusnendi (2003) asserts that the concept of firm productivity is divided into two parts: Individual productivity and organizational productivity. Individual dimension is associated with the characteristics of the employees working in the organization. This has to do with the characteristics of individual employees working in the organization, their mental attitude and efforts to improve firm productivity. Organizational dimensions on the other hand is concerned with the framework of the relationship between input and output techniques within the organization. Syverson (2011) states that productivity is typically expressed as an output/input ratio. It can be measured as single factor productivity or total factor productivity. Single-factor productivity reflect units of output produced per unit of a particular input such as labour, capital or material. Labor productivity is the most common measure of single factor productivity. Single factor productivity is affected by the intensity of use of the excluded inputs.

Sales Growth

Sari, Miyasto & Mawardi (2017) states that sales are the activities of a firm in selling its product or service while sales growth is the number of sales from year to year. A positive sales growth means that there is an increase in sales from the previous year. Similarly, negative sales growth implies sales decline from the previous year. In the calculation of the firm's profit / loss, sales are in the top spot in the calculation, hence it is also called top line, then various expenses, including taxes are deducted to generate net income. The greater the firm's sales the better the firm is able to convert its product or services into cash from its sales activities.

Febriyanto (2018) describes a firm's sales growth is an increase in sales from year to year, or as an indicator of increased market share of the firm. For firms that have high sales growth, the firms also have a good growth. The implication of sales growth is that it could be interpreted positively by investors as the firm has good prospects for the future, thereby increasing the value of the firm. Widarjo & Setiawan (2009) states that sales growth reflects the firm's ability over time to attract more customers and increase its sales. The higher the level of sales growth of a firm, the higher the firm is successful in executing its strategy. Sales growth shows a positive signal where a firm is able to increase its profits through its sales and has a positive impact on firm value. Thus, sales growth has a positive association with firm value.

Sales Per Employee

Prakash, Jha, Prasad & Singh (2017) states that firms often employ a bundle of resources or input such as labour, capital, material, energy and others to produce output, therefore, partial productivity indicate the ratio of total output to one class of input. In view of this, labour productivity is computed by dividing total sales with total number of employees. Bloom & Van (2010) state that there is strong relation between human resource management and firm performance in terms of productivity and profitability. The relationship suggests that human resource practices on reward and performance improve firm productivity. The relationship also leads to raising job satisfaction of employees. Kenton (2020) states that sales per employee is calculated as a firm's total revenue divided by its current number of employees. Sales per employee is an important ratio that roughly measures how much money each employee generates for the firm. The sales per-employee ratio is most useful when looking at historical changes in a firm's own ratio or when comparing it against that of other companies in the same industry as part of a fundamental analysis.

Assets Turnover

Howard (2020) defines asset turnover ratio measures the efficiency of a company's assets to generate revenue or sales. It compares the dollar amount of sales or revenues to its total assets. The asset turnover ratio calculates the net sales as a percentage of its total assets. Sari, Miyasto & Mawardi (2017) states that assets turnover ratio otherwise known as total assets turnover is the ratio of asset management, measuring the rotation or utilization of all assets at the disposal of a firm's management. If the firm does not get enough business volume to justify the size of the investment in its total assets, then total assets ratio will drop. A low assets turnover ratio indicate that the firm does not operate in a volume that is commensurate with the investment capacity of the firms. Thus, the firm is less able to manage its assets, therefore, the firm's assets are less effective and efficient in generating sales.

Brain (2021) states that asset turnover ratio measures the efficiency of a company's assets to generate revenue or sales. It compares the number of sales or revenues to its total assets. The asset turnover ratio calculates the net sales as a percentage of its total assets. Generally, a higher ratio indicates that the firm is efficient in generating sales or revenues. A lower ratio illustrates that the firm is not using the assets efficiently and has internal problems.

Asset turnover ratios vary throughout different sectors, so only the ratios of firm that are in the same sector should be compared. In certain sectors, the asset turnover ratio tends to be higher for companies than in others. For example, retail companies have relatively small asset bases combined with high sales volume. This leads to a high average asset turnover ratio. Meanwhile, firms in sectors such as oil and gas and utilities tend to have large asset bases and low asset turnover. Investors use this ratio to compare similar companies in the same sector or group to determine who's getting the most out of their assets and to identify help identify weaknesses. The asset turnover ratio is calculated by dividing net sales or revenue by the average total assets.

Firm Value

Nurul, Glauco and Khine (2015) state that firm value represents the assets owned by the company. Firm value is considered a crucial thing since it describes the prosperity of the firm owner. Therefore, the manager, as the representative of the company, is responsible to achieve the firm value optimally. Ibrahim and Hussaini (2015) state that investors, both existing and potential, regard firm value as the fundamental reason for investing in a particular firm. Stock prices are important metrics for measuring firm values. Stock value can be in form of capital appreciation or depreciation plus dividend received if any. Therefore, the value attached to the stock matters a lot to the investors in the stock market. Theriou (2000) opines that the relationship between productivity and firm value is not clear and fixed. This is because there are cases where the profitability of a firm is good because of its ability to impose higher sale prices, or buy inputs at lower prices, or keep lower stock levels, but productivity is poor. On the other hand, there are cases where a firm with high productivity is not profitable.

Net Assets

Chen (2020) describes net assets in the context of firm and business entities as the difference between the assets and the liabilities of the firm which is also called the net worth or the capital of the firm. It is calculated as the total value of the entity's assets minus the total value of its liabilities as at a stated period. Kenton (2021) describes net asset assets value per share as a firm's total assets value minus its total liabilities, divided by its number of shares outstanding. For publicly traded companies, investors can use asset value per share to compare the price of the company's stock to the underlying value of the business. Investors watch for significant differences between these two numbers to make buy or sell decisions. Net assets value has also gained popularity in relation to the fund valuation and pricing, which is arrived at by dividing the difference between assets and liabilities by the number of shares/units held by the investors. The fund's net assets value represents a "per-share" value of the fund, which makes it easier to be used for valuing and transacting in the fund shares. It is often the case that NAV is close to or equal to the book value of a business. Companies considered to have high growth prospects are traditionally valued more than NAV might suggest. Net asset value is most frequently compared to market capitalization to find undervalued or overvalued investments.

Theoretical Review

Production Theory propounded by Jean-Baptiste Say in 1803 and also Labor Theory of Value propounded by Adam Smith, David Ricardo and Karl Marx in the 19th century were used to support the study.

Production Theory

Production Theory was propounded by the French economist Jean-Baptiste Say in 1803. The theory of production explains the optimum combinations of factors so as to minimize the cost of production by a firm and maximize firm value. The theory of production helps us to determine the profit maximizing output, which depends on marginal and average costs of production besides demand conditions. In economics, production theory explains the principles in which the business has to take decisions on how much of each commodity it sells and how much it produces and also how much of raw material, fixed capital and labor it employs and how much it will use. It defines the relationships between the prices of the commodities and productive factors on one hand and the quantities of these commodities and productive factors that are produced on the other hand. The economic value of physical outputs minus the economic value of physical inputs is the income generated by the production process. This increase in the production process will make more products available for sale and thus increase the sales growth which will influence net assets of the firms.

Labor Theory of Value

This Theory was developed by Adam Smith, David Ricardo, and Karl Marx in the 19th century. The labor theory of value was an early attempt by economists to explain why goods were exchanged for certain relative prices on the market. The theory suggested that the value of a commodity was determined by and could be measured objectively by the average number of labor hours necessary to produce the goods or services. In the labor theory of value, the amount of labor that goes into producing an economic good is the source of that good's value. In the labor theory of value, relative prices between goods are explained by and expected to tend toward a "natural price," which reflects the relative amount of labor that goes into producing them. The labor theory of value has, however, fallen out of favor among most mainstream economists. Therefore, sales per employee depict the amount of labor that goes into producing economic products which in turn increases the net assets value of firms.

The main objective of the study is to analyze the influence of productivity on the firm value of oil and gas firms in Nigeria. On the other hand, The Production Theory explains the optimum combinations of factors needed by a firm to minimize the cost of production and maximize firm value. In addition to its connection with the main objective of the study, the Production Theory also explained how the specific objectives of the study which are; sales growth, sales per employee, and asset turnover influence the production of economic goods and how they influence firms' value. In view of this, the study is anchored on the Production Theory.

Empirical Review

Afinindy, Salim & Ratnawat (2021) adopted a quantitative research design to analyze the effect of profitability, firm size, liquidity, and sales growth on firm value in food and beverage companies listed on the Indonesia Stock Exchange. Secondary data were collected from the sampled firms from 2013 to 2018. Ordinary least square regression analysis and t-statistics were used to analyze the data collected. The finding indicates that firm size and sales growth did not increase the capital structure and firm value. Finding also shows that profitability does not affect the capital structure, but it does affect firm value. Meanwhile, liquidity affects the capital structure, but not firm value. It was also found that capital structure affects firm value. The results of the mediation test show that the capital structure is only able to mediate the effect of liquidity on firm value. This explains that the implementation of good liquidity can improve the capital structure generated by the firm, so that the firm value also increases, which ultimately investors respond positively.

Wahyud (2020) studied the effect of leverage, profitability, and sales growth on firm value using manufacturing firms listed in Indonesia during 2016-2018. Thirteen (13) out of the 43 manufacturing firms listed in Jakarta Stock Exchange were sampled using purposive sampling method. Secondary data were collected from the sampled firms and analyzed using multiple regression analysis. Results of the analysis discloses that leverage has a significant positive effect on firm value while sales growth and profitability have no significant effect on firm value.

Nguyen, Nguyen, Ngo, & Nguyen (2019) analyzed the relationship between productivity and firm's performance in Vietnam during the period of 2010 to 2017. All the non-financial firms listed on Ho Chi Minh City Stock Exchange and Ha Noi Stock Exchange were used for the study. Specifically, the relationship between labor productivity, foreign ownership and other firm-level characteristics and firm performance were evaluated. Results show that increasing labor productivity and increasing foreign ownership increase firm value. Also, variables such as liquidity and firm size have positive effects on firm value measured by Tobin's Q.

Fauver, McDonald & Taboada (2015) examine whether an employee-friendly corporate culture that provides higher levels of compensation, benefits, training, and equal opportunities for advancement increases firm financial value and efficiency. A sample of 3,034 firms from 44 countries of the World for the period 2002 to 2013 was used for the study. Result of regression analysis indicate that firms with a more employee-friendly culture have higher valuation and better performance. It was also observed that better employee treatment fosters innovation and technical efficiency, suggesting that these are two viable channels through which an employee-friendly culture affects firm value. The results are more pronounced in countries with high labor market flexibility.

Harahapa, Septiania & Endria (2020) adopted panel data regression analysis to study the effect of current ratio, return on equity, net profit margin, total asset turnover and debt to asset ratio on firm value. A sample of 4 cable sub-sector firms from the manufacturing industry were sampled for the study. Secondary data covering the period of 2014 to 2018 were collected and analyzed. Result of the panel data regression analysis reveals that return on

equity had a negative influence on firm value, while net profit margin, total assets to turnover and debt to assets ratio had positive effects on firm value. It was, however, observed that current ratio had no effect on firm value. Taken together all the financial performance variables affect firm value of the manufacturing firms. The implications of this finding are that firm value of the firms can be improved if the firms maintain a balanced capital structure between debt and equity, provided that debt is used to finance assets that are productive and efficient so that they can generate profits.

Radja & Artini (2020) explored the effect of firm size, profitability and leverage on firm value of manufacturing companies sector consumer goods industry listed in Indonesian Stock. The population of this research compress firms in the consumer goods sector registered Jakarta Stock Exchange in 2017-2019. A sample of 33 firms was selected using saturated sampling technique while multiple regression analysis was used to analyze the secondary data obtained from the firms. On the strength of the data analysis, it is observed that firm size, profitability, and leverage has a positive and significant effect on firm value in the consumer goods sector manufacturing firms during the period.

Methodology

This study adopted *ex post facto* research which provides an empirical solution to research problems by using data that are already in existence. The study is therefore based on the published financial statement of the selected oil and gas firms in Nigeria. The source of data for the study is secondary. Data on sales growth, sales per employee, assets per employee, and net assets were collected from the published annual report and financial statement of the selected oil and gas firms in Nigeria for a period of ten years (2011 to 2020). This study was conducted in Nigeria and specifically on oil and gas firms listed on the Nigeria Stock Exchange during the relevant period.

The population of the study comprised eleven (11) oil and gas firms listed on the Nigeria Stock Exchange Market. A sample of eight (8) firms was drawn from the twelve 11 oil and gas firms. Random sampling technique method was used in selecting the 6 firms. The selected oil and gas firms are Total Nigeria Plc, Mobil Oil Nigeria Plc, Conoil Nigeria Plc, MRS Oil Nigeria Plc, Eterna Nigeria Plc, Forte Oil Nigeria Plc, Oado, and Seplat Petroleum Development Company Plc.

Multiple Regression Analysis and t-Statistics were used to analyze the data collected and to test the null hypothesis formulated for the study. Adjusted Coefficient of Determination (R²) was used to examine the extent to which the variations in the dependent variable were caused by the independent variables. The independent variables of the study and proxies for productivity are Sales Growth, Sales Per Employee, and Assets Per Employee while the independent variable and measure of firm value is Net Assets.

Model Specification

The following model was developed based on the variables used in the study:

$$NAS = \beta_0 + \beta_1 \text{LogSLGR} + \beta_2 \text{LogSPE} + \beta_3 \text{AST} + \beta_4 \text{ASGR} + \beta_4 \text{PPE} + \varepsilon$$

Where:

NAPS = Net Assets Per Share

SLG = Sales Growth Rate

SPE = Sales Per Employee to Total Assets Ratio

AST = Assets Turnover Ratio

Data Presentation and Analysis

Data Presentation

The study examined the influence of productivity on firm value of oil and gas firms in Nigeria. Six (6) oil and gas firms listed on Nigeria Stock Exchange during the period were sampled for the study. Secondary data were collected from the annual report and financial statement of the firms selected firms covering the period of 2011 to 2020. Data collected were logged and presented in table 4.1 while the raw data is presented as Appendix One of the studies.

Table 1: Logged Data

FIRM	YEAR	SALES GROWTH	SALES PER EMPLOYEE	ASSETS TURNOVER	NET ASSETS VALUE
TOTAL	2011	7.13	5.53	2.96	7.00
	2012	7.64	5.57	2.86	7.05
	2013	7.31	5.67	3.00	7.12
	2014	6.39	5.69	2.52	7.14
	2015	(7.51)	5.70	2.49	7.21
	2016	7.92	5.65	2.12	7.37
	2017	(6.46)	5.79	2.67	7.42
	2018	7.30	5.80	2.32	7.49
	2019	(7.20)	5.83	2.18	7.45
	2020	(7.94)	5.82	1.43	7.45
MOBIL	2011	6.57	5.74	1.87	6.65
	2012	7.27	5.79	2.40	6.82
	2013	(6.31)	5.93	1.93	5.98
	2014	(17.66)	5.91	0.65	7.13
	2015	7.27	5.53	0.93	7.19
	2016	7.64	5.75	1.53	7.33
	2017	7.49	6.03	1.68	7.44
	2018	7.59	6.22	2.33	7.53
	2019	7.43	6.35	2.10	7.60
	2020	(7.44)	6.44	1.76	7.60
CONOIL	2011	7.58	5.56	2.27	7.23
	2012	7.23	5.72	1.90	7.19
	2013	(6.88)	5.79	1.82	7.26
	2014	6.98	5.77	1.82	7.21
	2015	(7.49)	5.90	1.85	7.25
	2016	(7.64)	5.83	1.31	7.27
	2017	7.48	5.69	1.58	7.25
	2018	6.83	5.73	2.01	7.26
	2019	7.24	5.78	2.02	7.28
	2020	(7.35)	5.85	2.40	7.29
MRS	2011	(6.52)	5.57	0.98	7.28
	2012	6.92	5.82	1.43	7.28
	2013	6.91	5.96	1.34	7.29
	2014	6.66	6.01	1.60	7.31
	2015	(6.72)	6.05	1.30	7.32
	2016	7.35	5.82	1.35	7.35
	2017	(6.41)	5.93	1.72	7.36
	2018	(7.24)	5.96	1.65	7.32
	2019	(7.38)	5.94	1.48	7.28
	2020	(7.37)	5.82	1.15	7.23
ETERNA	2011	(8.01)	6.45	2.66	6.74
	2012	7.70	5.88	2.70	6.81
	2013	6.94	6.23	5.39	6.85
	2014	(7.21)	6.28	4.41	6.93
	2015	7.01	6.17	3.22	6.99
	2016	7.17	6.22	3.37	7.03
	2017	7.82	6.28	3.60	7.09
	2018	7.90	6.37	4.74	7.11
	2019	(7.35)	6.48	8.04	7.09
	2020	(8.23)	6.45	1.64	7.55
FORTE	2011	(7.20)	6.12	2.59	6.77
	2012	(7.42)	6.09	2.14	6.88
	2013	7.57	6.00	1.22	7.63

2014	7.62	6.17	1.22	7.65
2015	(7.66)	6.30	1.02	7.67
2016	(6.55)	6.21	0.86	7.64
2017	(7.35)	6.24	0.67	7.66
2018	7.46	6.16	2.10	7.14
2019	7.56	6.32	3.06	7.24
2020	6.71	6.45	2.93	7.26

Source: Annual Financial Statement of the Firms

Data Analysis

The data collected from the selected oil and gas firms were analyzed using Multiple Regression Analysis and t-statistics and the results are presented in tables 2 and 3.

Table 2: Model Summary

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
1	.6622(a)	.5779	.5482	0.1071

Predictors: (Constant), LogSLG, LogSPE and AST.

Source: SPSS Output

Results from the model summary in table 2 show that the value of the Adjusted Coefficient of Determination (R^2) is 0.5482. This implies that 55% of the total variation in the dependent variable (Net Assets Value) of oil and gas firms in Nigeria is caused by the independent variables (Sales Growth, Sales Per Employee, and Assets Turnover) while the remaining 45% is caused by error margin and other qualitative and quantitative factors outside the model of the study.

Table 3: Multiple Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	205.5257	126.2243		2.9963	.1062
	LogSLG	.8058	.0583	1.4126	2.6455	.0000
	LogSPE	.7814	.0221	2.8277	2.3101	.0098
	AST	.1633	.0307	1.1313	0.5685	.2417

Source: SPSS Output

Table 3 presents the regression results of the analysis. The coefficients of the multiple regression can be replaced in the multiple regression equation as $\text{LogNAV} = 0.8058\text{LogSLG} + 0.7814\text{LogSPE} + 0.4633\text{AST} + \epsilon$

Test of Hypotheses

Decision Rule

Level of significance (α) = 0.05. Reject the null hypothesis if the significant value in the regression coefficient is less than the level of significance (0.05), otherwise accept the null hypothesis. Based on this decision rule, we present the results of the test of hypotheses.

Test of Hypothesis One

H_0 : Sales growth does not significantly influence the net assets value of oil and gas firms in Nigeria.

H_a : Sales growth significantly influences the net asset value of oil and gas firms in Nigeria.

Results from table 4.2.4, show that the significant value of Sales Growth (LogSLG) is significant at 0.05 level of significance ($0.05 > 0.0000$). Therefore, we reject the null hypothesis and accept the alternative which states that Sales Growth significantly influences the net assets value of oil and gas firms in Nigeria.

Test of Hypothesis Two

H₀: Sales per employee do not significantly influence the net assets value of oil and gas firms in Nigeria.

H_a: Sales per employee significantly influence the net assets value of oil and gas firms in Nigeria.

The regression table also indicates that the significant value of Sales Per Employee (LogSPE) is significant at a 0.05 level of significance ($0.05 > 0.0098$). Therefore, we reject the null hypothesis and accept the alternative which states that Sales Per Employee significantly influence the net assets value of oil and gas firms in Nigeria.

Test of Hypothesis Three

H₀: Asset's turnover does not significantly influence the net asset value of oil and gas firms in Nigeria.

H_a: Asset's turnover significantly influences the net asset value of oil and gas firms in Nigeria.

The regression table also indicates that the significant value of Assets Turnover (AST) is not significant at a 0.05 level of significance ($0.05 < 0.2417$). Therefore, we accept the null hypothesis which states that Assets Turnover does not significantly influence net assets value of oil and gas firms in Nigeria.

Discussion of Findings

Discussion of Finding One: The coefficient of Sales Growth in the multiple regression model is positive, 0.8058 and equally significant at 5% level of significance ($0.05 > 0.0000$). These results means that the influence of Sales Growth on Net Assets Value of oil and gas firms listed on the Nigeria Stock Exchange is positive and statistically significant. This result is consistent with Production Theory propounded by Jean-Baptiste Say in 1803. The Theory explains the optimum combinations of factors that will minimize cost of production and maximize firm value. The theory states that profit maximizing output depends on marginal and average costs of production as well as demand for the product and services.

Febriyanto (2018) who examined the effect of leverage, sales growth and liquidity on firm value of real estate and property firm in Indonesia and found that sales growth has a significance and positively influence on firm value. Zulkifli, Rivai, Suharto (2020) who studied the effect of firm size and sales growth on capital structure with profitability as mediation in construction and building sub-sector firms listed in Indonesia and found that sales growth affects profitability. The result is not in agreement with the finding of Wahyud (2020) who studied the effect of leverage, profitability, and sales growth on firm value in manufacturing firms listed in Indonesia and found that leverage has a significant positive effect on firm value while sales growth and profitability have no significant effect on firm value. Afinindy, Salim & Ratnawat (2021) who studied the effect of profitability, firm size, liquidity, and sales growth on firm value in food and beverage firms in Indonesia found that firm size and sales growth did not increase the capital structure and firm value.

Discussion of Finding Two: The regression table also shows that the coefficient of Sales Per Employee is positive, 0.7814, and also significant at 5% level of significance ($0.05 > 0.0098$). These results imply that the influence of Sales Per Employee on the Net Assets Value of oil and gas firms listed on the Nigeria Stock Exchange is positive and statistically significant. This result is consistent with the Production Theory propounded by Jean-Baptiste Say in 1803. The Theory explains the optimum combinations of factors that will minimize the cost of production and maximize firm value. The theory states that profit-maximizing output depends on marginal and average costs of production as well as demand for the product and services.

The result is in agreement with the findings of Nguyen, Ngo, & Nguyen (2019) who analyzed the relationship between productivity and firm performance in Vietnam and observed that increase in labor productivity and increase in foreign ownership also increases firm value. Fauver, McDonald & Taboada (2015) who examined whether an employee-friendly corporate culture that provides higher levels of compensation, benefits, training and equal opportunities for advancement increases firm value and found that employee-friendly culture has higher valuation and better performance. The result is not in line with the findings of: Bahman & Fakhroddin (2012) who analyzed the impact of firm productivity on loss of unprofitable firms listed on the Tehran and conclude that both human capital efficiency and capital employed efficiency negatively related with firm losses.

Discussion of Finding Three: The regression model also reveals that the coefficient of Assets Turnover is positive, 0.1633, though, not significant at 5% level of significance ($0.05 < 0.24717$). These results suggest that the influence of Assets Turnover on Net Assets Value of oil and gas firms listed on the Nigeria Stock Exchange is positive, but not statistically significant. This result is consistent with Production Theory propounded by Jean-Baptiste Say in 1803. The Theory explains the optimum combinations of factors that will minimize cost of production and maximize firm value. The theory states that profit maximizing output depends on marginal and average costs of production as well as demand for the product and services.

This result is in line with the findings of: Harahapa, Septiania & Endria (2020) who studied the effect of current ratio, return on equity, net profit margin, total asset turnover and debt to asset ratio on firm value and concluded that return on equity had a negative influence on firm value, while net profit margin, total assets to turnover and debt to assets ratio had positive effects on firm value. Nguyen, Nguyen, Phung & Nguyen (2019) who studied the effects of product and process innovations and their interactions with external collaboration on firm performance and corporate social responsibility activities in Vietnamese manufacturing firms and found that process and product innovations are beneficial to firm performance in terms of market share. No study reviewed appears to in disagreement with this result.

Summary of Findings

Based on the data analysis, findings and discussions thereof, we summarize the findings of the study as follows;

- I. The influence of sales growth on net assets value of oil and gas firms in Nigeria is positive and also statistically significant. The implication of this finding is that an increase in sales growth will result in more than proportionate increase in net assets value of the oil and gas firms.
- II. Sales per employee positively and significantly influence net assets value of oil and gas firms in Nigeria. This implies that as an increase in sales per employee will lead to a more than proportionate increase in net assets value of the firms.
- III. The influence of assets turnover on net assets value of oil and gas firms in Nigeria is positive, but not statistically significant. The implication of this finding is that an increase in assets turnover will lead to less than proportionate increase in net assets value of the firms.

Conclusion

The study explored the influence of productivity on firm value of oil and gas firms in Nigeria. In order to conduct the study, 6 oil and gas firms were randomly selected from the 11 oil and gas firms quoted on the Nigeria Stock Exchange during the period of 2011 to 2020. Secondary data were collected from the selected firms and analyzed using multiple regression analysis and t-statistics. Based on the model summary, we conclude that the independent variables (sales growth, sales per employee, and assets turnover) of the study adequately explained the dependent variable (net assets value). We also conclude that the influence of sales growth and sales per employee on the net assets value of the firms are positive and statistically significant while the influence of assets turnover on the net assets value of the firms is positive, but statistically not significant.

Recommendations

Judging from the findings of the study, and the discussions that ensuing conclusions, we recommend that;

- I. at oil and gas firms' managers in Nigeria should improve their firm value by growing the sales of the firms. In light of the current excess crude oil production and the crash in the international oil price, oil and gas sales can only be increased through high-quality products and cordial business relationships with customers.
- II. That oil and gas firm managers in Nigeria should increase their firm value by increasing sales per employee. Two possible ways to achieve this is either to increase the sales value or reduce the number of employees working in the firms.
- III. That oil and gas firm managers in Nigeria should maximize firm value by increasing the assets turnover of their firms. Asset's turnover can be increased either by reducing investment in total assets or by increasing firm sales.

References

- Afinindy, I, Salim, U & Ratnawat, D.R (2021). The effect of profitability, firm size, liquidity, sales growth on firm value mediated capital structure. *International Journal of Business, Economics and Law*, 24(4), 15-22.
- Agiomirgianakis, G. M., Magoutas, A. I., & Sfakianakis, I. (2013). Determinants of probability in the Greek tourism sector revisited: The impact of the economic crisis. *Journal of Tourism and Hospitality Management*, 1(1), 12- 17.
- Bahman, B & Fakhroddin, M (2012). Productivity and firm performance: Evidence of Iranian unprofitable firms. *Australian Journal of Basic and Applied Sciences*, 6(7), 158-166.
- Behnam, N (2014). Impact of Training on Employee's Performance and Productivity in Construction Industry. Publication of University of California.
- Bloom N, Van, R.J (2010). Human Resource Management and Productivity. NBER Working Paper [16019]. Available from SSRN: <http://ssrn.com/abstract=1612613>
- Brain, B (2021). How Is Asset Turnover Calculated? <https://www.investopedia.com/ask/answers/032415/how-asset-turnover-calculated.asp>
- Boring, P (2019). The relationship between firm productivity, firm size and CSR objectives for innovations. *Eurasian Business Review*, 9(1),269-297.
- Burger, A and Moormann, J (2008). Productivity in banks: myths & truths of the Cost Income Ratio. *Banks and Bank Systems Journal*, 3(4), 105-115.
- Chen, M (2006). Financial effects and firm productivity: Evidence from Chinese manufacturing firms. *Journal of economic and Accounting*, 5(2), 201-210.
- Chen, J (2020). Net Asset Value. <https://www.investopedia.com/terms/n/nav.asp>
- Febriyanto, F. C (2018). The effect of leverage, sales growth and liquidity to the firm value of real estate and property sector in Indonesia stock Exchange. *Economics and Accounting Journal*. 1(30), 198-205.
- Fauver, L, McDonald, M.B & Taboada, A (2015). Does it pay to treat employees well? International evidence on the value of an employee-friendly Culture. A paper presented to Corporate Governance Center, The University of Tennessee, France.
- Jahchan, P (2017). What is productivity, and how do you measure it? <https://www.weforum.org/agenda/2016/07/what-is-productivity-and-how-do-you-measure-it/>
- Howard, E (2021). How is asset turnover calculated? <https://www.investopedia.com/ask/answers/032415/how-asset-turnover-calculated.asp>
- Harris S and Antti, K (2003). Subjective productivity measurement. *Journal of American Academy of Business*. 2003;2(2):531-537.
- Harahapa,I.M, Septiania, I & Endria, E (2020). Effect of financial performance on firm value of cable companies in Indonesia. *Accounting Journal* 6(1), 1103-1110.
- Kenton, W (2020). Revenue Per Employee. <https://www.investopedia.com/terms/r/revenueperemployee.asp>
- Kelly, R.C (2020). Labor Theory of Value. <https://www.investopedia.com/terms/l/labor-theory-of-value.asp>
- Kenton, W (2021). What is net asset value per share? <https://www.investopedia.com/terms/a/asset-value-per-share.asp>
- Kumar,S. S (2013). Total Factor Productivity of Indian Banking Sector - Impact of Information Technology. *Reserve Bank of India Occasional Papers*, 34(1&2) of 2013.
- Kusnendi, K. (2003). Economics of Human and Nature Resources. Jakarta: Universitas Terbuka.
- Nayak, S.R., Patra, S. (2013). Wage-labour productivity relationship in manufacturing sector of Odisha: An observed analysis. *International Journal of Engineering Science Invention*, 2(3), 8-11.
- Ibrahim, I. & Hussaini, B. (2015). Firm Specific Characteristics and Firm values (Evidence from Listed Food and beverages Firms in Nigeria). *Research Journal of Finance and Accounting*.6(1), 16-25.
- Lumapow, L.S and Tumiwa, R.A (2017). The effect of dividend policy, firm size, and productivity to the firm value. *Research Journal of Accounting and Finance*, 8(22), 225-235.
- Prakash, A., Jha, S. K., Prasad, K. D., & Singh, A. K. (2017). Productivity, quality and business performance: an empirical study. *International Journal of Productivity and Performance Management*, 66(1), 78-91.
- Narwal, K.P and Pathneja, S (2015). Determinants of Productivity and Profitability of Indian Banking Sector: A Comparative Study. *Eurasian Journal of Business and Economics* 2015, 8(16), 35-58.
- Neves, M.E; Proença, C and Dias, A (2020). Bank profitability and efficiency in Portugal and Spain: A Non-Linearity Approach. *Journal of Risk and Financial Management*, 13(2), 284-293.
- Nguyen, P.A, Nguyen, A.H, Ngo, T.P, & Nguyen, P.V (2019). The relationship between productivity and firm's performance: Evidence from Listed Firms in Vietnam Stock Exchange. *Journal of Asian Finance Economics and Business* 6(31),131-140.

- Nguyen, T. C, Nguyen, T. L, Phung, A. T & Nguyen, V. K (2019). The impact of innovation on the firm performance and corporate social responsibility of Vietnamese Manufacturing Firms. *MDPI Sustainability Journal*, 11(10), 2-14.
- Nurul, M, Glauco, D. V & Khine, S. K (2015). Exchange rate movements and firm value Evidence from European firms across the financial crisis period. *Journal of Economic Studies*, 42(4), 561-577.
- Radja, F.L, & Artini, L.G. S (2020). The effect of firm size, profitability and leverage on firm value of manufacturing companies sector consumer goods industry listed in Indonesian Stock Exchange. *International Journal of Economics and Management Studies*, 7(11), 18-24
- Sari, D. N, Miyasto, A & Mawardi, W (2017). Determinant of profitability and its impact on firm value: evidence from Indonesia stock exchange. A paper in partial fulfillment of Master of Management, Faculty of Economics and Business Universities of Diponegoro.
- Suman, S (2021). Production: Meaning, Definition, Types and Factors. <https://www.economicdiscussion.net/production/production-meaning-definition-types-and-factors/12398>.
- Suganya, S. (2011). Review of how to measure employee productivity. Buzzle Online. Retrieved July 21, 2014 from <http://www.buzzle.com/articles/how-to-measure-employee-productivity.html>.
- Syverson, C (2011). What Determines Productivity? *Journal of Economic Literature*, 49(2), 326-365. <http://www.aeaweb.org/articles.php?Doi=10.1257/jel.49.2.32>
- Theriou, N.G (2000) The effect of productivity on profitability: A case study at firm level. A thesis submitted in partial fulfillment of the requirements of the University of Derby for the Degree of Doctor of Philosophy.
- Widarjo, W. & Setiawan, D (2009). Pengaruh Rasio Keuangan Terhadap Kondisi Financial Distress Perusahaan Otomotif. *Jurnal Bisnis dan Akuntansi*. 11(2), 107-119.
- Wahyud, S.M (2020). Effect of leverage, profitability, sales growth toward company values. *International Journal of Management Studies and Social Science Research*, 2(4), 161-169.
- Wahyu T. A (2020). The influence of risk management on financial performance and firm value: A case study on companies of crude petroleum and natural gas production sector listed at the IDX. *Journal and book hosting*, 12(23), 126-135.
- Zhang, L. 2005. The Value Premium. *Journal of Finance*, 60, 67-103.
- Zulkifli, D.R, Rivai, A, Suharto (2020). The Effect of company size and sales Growth on Capital Structure with Profitability as mediation in construction and building sub-sector companies registered in Indonesia Stock Exchange. *Journal of Business Management* 1(3),117-124.