Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 7, July, 2021:1584 – 1606

# Capıtal Structure And Corporate Fınancıal Performance Of Nıgerıan Lısted Downstream Oıl And Gas Fırms

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## Abstract

The rate of financial failures and disappointing performance among the oil and gas companies is worrisome, which has made investors to be apprehensive of the future of their investments. Consequently, we investigated the connection between the capital structure and financial performance of downstream oil and gas companies quoted on the Nigerian Stock Exchange with focus on long- term liquidity and solvency measured in terms of 'z' score and interest cover as dependent variables. Capital structure was proxied by total debt to equity. The study used ex-post facto research design. The population consisted of eight oil and gas companies listed on the Nigerian Stock Exchange as at 31st December 2017. The companies were chosen using purposive sampling technique. Required data were gathered from financial statements of the companies that were sampled using published data. Validity and reliability of the data were premised on the scrutiny and certification by the external auditors. In data analysis, descriptive and inferential statistics were used. The data were subjected to random effects and Driscoll-Kraay estimation models to test the hypothesis of the study. The study found that capital structure positively affected financial performance. Specifically, the study showed that total debt to equity ratio has positive and significant relationship with the financial performance of selected oil and gas firms in Nigeria proxied by 'z' core (coefficient of 0.231, p-value 0.010 and Adj R2 of 0.22%) and interest cover (coefficient of 0.043, p-value 0.035 and Adj R2 of 0.24%). This finding supports the trade-off theory which encourages the use of debt capital. The study recommends that the firm's managers should increase the use of long term funds and discourage the use of short term finance. It also recommends that the owners of the businesses should inject more equity finance as the total debt to equity ratio was considered too high.

***Keywords:*** *Downstream Activities, Interest Cover, Liquidity, Long Term Liquidity, Solvency, Total Debt to Equity, Z-score*

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## Introduction

Business organizations exist to establish certain objectives as set out primarily by the business owners and other stakeholders in the business. Broad decision areas of the finance manager include investment decisions, dividend decisions and financing decisions among others. Corporate financial performance is a demonstration of the results of these decision areas to show the financial health and wellbeing of firms (Wilson & Post, 2013).

A major factor that influences the corporate financial performance of business organizations is the capital structure. Sichizya (2015) revealed that capital structure relates to how a firm finances future investment by utilising a mix of both equity and debt. Siti (2012) disclosed that sources of funds to firms are retaining earnings, debt and equity. The study added that retained earnings are the cheapest fund as it does not have obvious costs like other sources. By implication, a firm's capital structure consists of all the sources of funding that the firm is able to utilise for its tasks in order to accomplish its set objectives of maximising the wealth of its shareholders and other stakeholders like, its creditors, financiers, employees among others.

Neru, Vintila and Gherghina (2018) and Oyedokun, Job-Olatunji and Sanyaolu (2018) discovered through their work that the influence of capital structure on firm risk and financial performance was significant. Olaniyan, Soetan and Simon-Oke (2017) and Nzeki (2017) also discovered mixed relationship between the performance of a firm and capital across African countries. However, Akingunola, Olawale and Olaniyan (2017) opined that capital structure exhibits a significant negative effect on corporate performance, through the study made on capital structure decisions and the performance of the firm.

The work of Nwaolisa and Chijindu (2016), and Oladeji, Ikpefan and Olokoyo (2015) stressed the prominence of capital structure in the oil and energy companies and revealed that financial structure (debt/equity ratio) exhibits negative influence on a firm's profitability and proposed that firms should use more equity than debt. Inversely, Akparbuere, Eze and Unah (2015) and Abdul and Adelabu (2015) had also researched into similar area of the effect of capital structure on financial performance of companies in the oil and gas sector which disclosed a positive and significant relationship subsists between the financial performance of the company and its financial leverage.

We hereby examined how the capital structures of oil and gas down-stream operators affect long-term financial stability of firms. The study evaluated the impact of the ratio of debt-to-

equity of the companies to their financial health, which is measured in terms of Z-score, and interest cover.

**The Problem, Objectives and Hypotheses**

According to Nwaolisa and Chijindu, (2016), Nigeria is a major oil producer in the world which has remains the major contributor to the economy of the nation. However, in recent times, the sector's contribution has been declining constantly. For instance, from a ninety (90%) percent contribution to the annual revenue of the federal government, the contribution has reduced to about 45% in the current 2020 budget estimate of the federal government (Nwaolisa & Chijindu, 2016). However, reviews from studies on capital structure effect on financial performance by various authors, established conflicting results about the effect that capital structure exhibits on financial performance of companies. While some studies established a negative impacts (Nwaolisa & Chijindu, 2016; Oladeji, Ikpefan & Olokoyo, 2015). Others maintained a positive or insignificant impact (Akparbuere, Eze & Unah, 2015; Abdul & Adelabu, 2015). This has prompted this study to ascertain the right direction for the argument by investigating the impact of total debt-to-equity (TDE) ratio on the financial performance of the downstream oil and gas companies in Nigeria. The specific objectives of the study are to:

**Objective I:** determine the impact of total debt-to-equity (TDE) ratio on financial performance of downstream oil and gas companies in Nigeria.

**Objective II:** determine the impact of total debt-to-total assets (TDTA) ratio on financial performance of downstream oil and gas companies in Nigeria.

**Objective III:** evaluate the impact of long-term debt-to-total assets (LTDTA) ratio on financial performance of downstream oil and gas companies in Nigeria.

**Objective IV:** investigate the impact of short-term debt-to-total assets (STDTA) ratio on financial performance of downstream oil and gas companies in Nigeria.

The related hypotheses to the study are quoted in null terms as below:

$H_0$1: Total debt-to-equity ratio does not have a significant effect on the financial performance of downstream oil and gas companies in Nigeria.

$H_o$2: Total debt-to-total assets ratio does not have a significant effect on the financial performance of downstream oil and gas companies in Nigeria.

$H_0$3: Long term debt-to-total assets ratio does not have a significant effect on financial performance of downstream oil and gas companies in Nigeria.

$H_0$4: Short term debt-to-total assets ratio does not have a significant effect on financial performance of downstream oil and gas companies in Nigeria.

**Review of Related Literature and Theoretical Underpinning**

The concept of financial performance and its measures is a contentious issue due to its multi-dimensional implications and it has continued to challenge scholars due to its complex nature (Itiri, 2014). Information asymmetry between management and other contracting parties or stakeholders generate a request for an internally generated portion of firm performance to be recounted over determinate intervals to provide information to investors and creditors on the earnings ability of the entity. A firm's accomplishment is fundamentally illuminated by its performance over a certain period of time and measuring the performance provides invaluable information that enables assessment of performance, reporting progress, expand motivation and communication and highlight areas of problems that need to be addressed. Akinsulire (2006) stated that to enhance good understanding, easy appreciation and interpretation of accounts, financial analysis is grouped into four categories namely: short-term solvency and liquidity, long-term solvency and stability, efficiency and profitability and potential and growth.

Profitability measures are financial methods use in comparing how efficiently a firm has been able to produce incomes relative to its overheads and other relevant associated costs incurred during a specific period of time (Awuag-Agyeman, 2015). Some of these measures are: PAT, PBT, ROE and ROA. On the hand, Short term liquidity represents ability of a company to change its assets into immediate cash and with lower costs as possible (Wesen, 2019). This measure reflects the short-term financial strength of the organization. The liquidity of a firm is of special benefits to its short-term creditors since the liquidity of the firm confirms its ability to pay its immediate financial obligations. Some of these measures are: current ratio, quick ratio and operating cash flow ratio.

The Potential and growth measures indicate the measures put in place by the management of organization to grow and expand the business in the future and attract quality investors. The ratios under this category include: earnings per share (EPS), dividend per share (DPS), price earnings ratio (PE ratio), dividend yield (DY), Tobin's Q, market value added (MVA), earnings yield and dividend cover among others (Al-matari, Fadzil & Al-swidi, 2014). The Long-term solvency and liquidity measure relates to the firm's ability to comply with its debts obligations as they fall due in the long term. It also measures how safe the firm is from collapse in event it suffers any set back. It indicates the capacity of the company to comply with its long-term financial commitments such as payment of interest on debt, the final payment of principal on debt and any other fixed financial obligations like lease payments.

Long term financial measures cover the following: total debt to assets ratio, total debt to equity ratio, interest cover ratio, fixed payment cover ratio and the 'z' score.

**Paper adopted financial performance measures**

**Dependent Variables:**

The concept of financial performance adopted in this study is the Long-term performance measures with focus on:

**Interest Cover Ratio:**

This ratio indicates how many times interest paid on borrowed funds is covered by net earnings (profit) before charging the interest and tax. The higher this ratio, the more solvent and stable a firm is considered to be. A low cover or ratio can make a business vulnerable to fluctuations in interest rate.

Interest Cover Ratio: EBIT (Earnings before interest and tax)

Interest Charge

**Z -score**:

This is a quantitative indicator developed by E. I. Altman meant for predicting insolvency and/or bankruptcy. The central notion was the mix of various weighted financial ratios to offer a single aggregate index referred to as the *Z*-score which is then used to classify a business as either failing, at risk of failing, or as non-failing. These five (5) ratios measure solvency, financial leverage, activity, operating efficiency and financial structure. It is computed thus:

Z---1.12(WC/TA) +1.4(RE/TA) +3.3(EBIT/TA) +0.6{(MVE+MVPS)/TL}+0.999(S/TA)

**Concept of Capital Structure:**

The concept of capital structure states that entities obtain funding for its capital requirements through various sources. Each of these sources of funding differs in risks and contractual agreements between the company and each provider of capital differ. Oyedokun, Job-Olatunji and Sanyaolu (2018) stated that to take financing decisions, decision makers need to establish the available sources of finance must be established by decision makers by bearing in mind the interest of fund providers, cost and benefits of funds, impact of those finance options on overall activities, and most importantly the suitable combination of all attainable funds. The various forms of capital available to corporate entities are: Equity capital, Retained earnings and debt capital.

**Paper adopted capital structure measures**

**Independent Variables:**

As captured in this study, the concept of capital structure adopted is:

Total Debt/Equity (TD/E) Ratio:

This is a test of financial stability and indicates the extent of cover available to external liabilities. It is defined thus:

$$\frac{\text{Total Debt (Short \& Long Term)}}{\text{Shareholders' funds (or Net Worth)}}$$

**Theory Adopted for the Study**

The theory adopted for the study is a type in the family of trade-off theory, referred to as the Static Trade-off Theory.

**The Static Trade-off Theory:**

The static trade-off theory originated from the debate that followed the Miller and Modigliani Theory when the tax component was introduced in 1963. The tax advantage of debt without consideration for offsetting cost of debt suggested a 100% debt financing for companies as being the best financing option. Although the debt capital comes with the tax shield advantage, there are also costs that come with debt financing. Emeh and Okoli (2015) opined that the static trade off theory by Modigliani and Miller in 1963, was one of the first set and most documented theory that explains the capital structure formulation using static trade-off models. The theory opines that optimal capital structure exist because a firm is believed to set a target debt level and gradually moves towards attaining it. The static trade-off theory explains that a firm's decision for achieving its optimal capital structure has to do with the trade-off between the corporate and personal taxes advantage of debt and several leverage-related costs.

The basic assumption of the static trade-off theory posits an optimal capital structure for the firm which is a point where tax benefits are equal to the costs of distress and bankruptcy. Another assumption is that capital market is efficient. However, this theory has been criticised on the premise that firms in practise do not have an optimal gearing level (Akingunola, Olawale and Olaniyan, 2017). The theory encourages the use of debt capital over equity due to its tax deductibility advantage and proffers the existence of an optimal target capital structure. The oil and gas industry is a capital intensive business both in terms of product trading and infrastructure establishment. Therefore, it is a normal practice for the industry players to borrow money direct from the financial institutions and/or raise debt capital from the capital market in addition to owners' equity. This experience in the industry does align with the trade-off theory. The trade-off theory recommends an optimal capital structure which gives lowest cost and maximizes the worth of the business. The theory

suggests that a positive relationship exists between the capital structure of a firm and its corporate financial performance.

**Empirical Review of Related Studies**

The study of Nwaolisa and Chijindu (2016) examined the link between corporate performance and capital structure of seven (7) construction and real estate firms that are quoted on the Nigerian Stock Exchange for the period between 1992 and 2013. Unit root test was applied by the study on the variables together with Johansen co-integration to assess the relationship of the variables while pooled OLS was used to ascertain the effect of financial structure on corporate performance. Return on assets and return on equity were employed as proxies for corporate performance while capital structure variables were total debt to equity (TD/E) ratio, total debt to total assets (TD/TA) ratio, and short-term debt to total equity (STD/E) ratio. Growth opportunities and taxation were used as control variables. The result revealed a positive relationship between debt-to-equity ratio and return on assets on one hand, and a positive relationship between growth opportunity and return on assets on the other hand, while tot al debt to total assets ratio and short-term debt to total equity and taxation presented a negative relationship with return on assets. The summary of the finding disclosed that firm's financial structure and performance are correlated and financial structure negatively affects firm performance and this supports the pecking order theory.

Nwaolisa and Chijindu (2016) did a study on the influence of financial structure on cost-effectiveness of oil and gas companies in Nigeria using population sample from ten companies out of fourteen companies cited in the Nigeria Stock Exchange for the period 1993 -2013. Pooled Ordinary Least Square, Fixed Effect and the Random Effect regression techniques were carried out on the data and the study established that there was negative influence triggered by financial leverage on profitability of oil and gas firms measured by Return on Assets, Return on Equity, Profit Before tax and Earnings per Share. This offers belief to the pecking order theory of financial structure which states that firms prefer internal financing before resorting to any form of external funds. It therefore suggested that oil and gas companies fund their operations with more equity capital.

Olaniyan, Soetan and Simon-oke (2017) examined the link between capital structure and the performance of firms using empirical evidence found in African countries with focus on sub-Saharan Africa. Generalised method of moments (GMM) was adopted using data from Nigerian Stock Exchange Fact book for 1996 to 2014. The proxies for firm performance were return on assets (ROA), return on equity (ROE), earnings per share (EPS) and Tobin's Q, while capital structure measure was debt ratio. The study found that capital structure, that is,

(debt/equity ratio) presents negative and significant relationship with firms' performance in Nigerian while with regards to capital structure, a mixed relationship was identified with firm performance across African nations. Agency costs among African firms were found to be relatively high which is responsible for their negative performance

Nasimi and Nasimi (2018) examined the influence capital structure has on profitability of twenty (20) non-finance firms itemized on the Pakistan Stock Exchange between the period of 2009 to 2015 by applying annual panel data. The data was analysed with the ordinary least square (OLS) technique. The study proxied capital structure using total debt-to-equity assets as well as total debt-to-total assets while the profitability variables were return on assets (ROA), return on equity (ROE) and net profit margin (NPM). The study findings showed that debt-to-assets ratio negatively relates with net profit margin and return on assets. However, debt-to-equity ratio has positive significant impact on return on equity. The study concluded that firm profitability is statistically and significantly impacted by an organisation's capital structure.

Etale and Uzakah (2019) observed the influence capital structure has on firm performance nexus in Nigeria's Aluminium Extrusion Company Plc, a company listed under the basic material sector of the Nigerian Stock Exchange. The variable for financial performance was return on capital employed (ROCE) while the proxies for capital structure were debt to equity ratio, debt to capital employed ratio and equity to capital employed ratio. The study used secondary data collected from the published statements of the company from 2009 to 2018. Descriptive statistics and multiple regression techniques were applied for data analysis. The study revealed that there is positive and significant effect of debt-to-equity ratio on return on capital employed, and that debt to capital employed ratio has negative influence on return on capital employed, while equity to capital employed ratio has no influence on return on capital employed. The study recommended that retained earnings should be used to finance the company's business and use debt capital as last choice in line with the pecking order philosophy.

Nelson and Peter (2019) examined capital structure effect on firm performance of microfinance banks in Nigeria from 2009 to 2018. The independent variables for capital structure were debt-to-equity ratio, long-term-debt ratio and total-debt-ratio. The explanatory variable was given as financial performance and proxied by return on equity (ROE). Descriptive statistics and regression techniques were used for data analysis. The result showed a negative and insignificant relationship between debt-to-equity ratio with return on equity while there is a positive insignificant influence of long-term-debt ratio on return on

equity. The result showed that total debt ratio has a positive and significant relationship with return on equity. The result also showed the combined effect of capital structure on firm performance represented by return on equity is statistically significant. The study did recommend that that microfinance banks in Nigeria should devise strategies that are effective to expand their debt profile in order to achieve better performance.

## Methodology

The study adopted the expo facto research design. Secondary data were gotten from the published accounts of the firms and from the fact book of the Nigerian Stock Exchange using purposive sampling technique to select the population of the study. Currently, there are twelve (12) quoted firms in the oil and gas division of the Nigerian Stock Exchange including upstream operators. The downstream operators are eleven (11) in number while there is only one (1) upstream operator. The researchers selected 8 out the 11 downstream companies that have filed their accounts to date for the study. These companies are: Oando Nigeria Plc., Conoil Nigeria Plc., Total Nigeria Plc., Mobil Nigeria Plc. (recently changed to 11 Plc), MRS Oil Plc., Forte Oil Plc., Eterna Plc. and Japaul Oil Plc. A period of eleven years from 2008 to 2018 was covered in the study.

**Model Specification**

The model below is developed using OLS Multiple Regression model in line with the theoretical framework which relates to the variables and the moderator variables.

Financial Performance =f (TD/E, Assets Tangibility and Sales Growth)

$Y_{it}=\alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} \ldots \varepsilon_i$ (i 1, 2, 3….,n)

Where,

$Y_{it}$=Dependent variable of the company which is the financial performance

$X_{it}$= independent variables of the company

α=the constant or Intercept term for X variable of the company

β1-β3 = coefficient of the independent variables (X) of the companies.

$\varepsilon_{it}$=The Stochastic or Random Variables or Error term

n-Coefficient for each of the independent variables.

In attempting to bring this general Ordinary Least Square model above into the specified variables in this study, two models can be demonstrated thus:

**Model 1**

$(Z\text{-}Score)_{it} = \alpha + \beta_1 (TD/E)_{it} + \beta_2 (ATC)_{it} + \beta_3 (SG)_{it} + \varepsilon_{it}$

**Model 2**

$(\text{Interest Cover})_{it} = \alpha + \beta_1(TD/E)_{it} + \beta_2(AT)_{it} + \beta_3(SG)_{it} + \varepsilon_{it}$

Where:

α= Constant Coefficient

$B_1$-$\beta_3$=Regression coefficients for measuring independent variables

TD/E=Total Debt to Equity

AT=Asset Tangibility

SG=Sales Growth

## Data Analysıs And Interpretatıon

The panel data regression results on capital structure effect on financial performance of oil and gas firms in Nigeria using descriptive statistics and diagnostic models of random effect and the Driscoll-Kraay standard error for time-fixed effects and ordinary least square. The study analysis discovered the presence of multicollinearity in some of the independent variables. This is because the value of the variance inflation factor is greater than 10. Thus, the researchers ran separate models for the four variables.

**Research Question 1**

Research question 1 intends to determine to what extent does total debt-to-equity ratio impact on financial performance of downstream oil and gas companies in Nigeria. The related hypothesis states that, the ratio of total debt-to-equity has no significant effect on financial performance of oil and gas downstream companies in Nigeria. The objective of this research question was to examine the impact of total debt-to-equity (TDE) ratio on financial performance of oil and gas downstream companies in Nigeria. The tables below present the data analysis.

**Table 1A: Regression for Capital Structure (Total Debt /Equity) and Corporate Financial Performance**

**Dependent Variable: ZSCORE**

**Estimation model: Random Effect**

| **Panel A: Variables** | Pooled OLS | Fixed Effect | **Random Effect** | Driscolli-Kraay |
|---|---|---|---|---|
| TDE | 0.065 | 0.331*** | 0.231** | 0.331*** |
| | (0.684) | (3.651) | (2.569) | (3.880) |
| SGROWTH | 0.716*** | 0.304 | 0.457** | 0.304 |
| | (3.235) | (1.549) | (2.277) | (1.544) |
| ASTANG | 2.963** | 3.171* | 2.667* | 3.171* |

| | | | | |
|---|---|---|---|---|
| | (2.193) | (1.924) | (1.805) | (2.227) |
| Constant | 2.165*** | 1.919*** | 2.109*** | 1.919*** |
| | (6.020) | (4.593) | (4.458) | (5.385) |
| **Panel B:Diagnostic Tests** | | | | |
| *Adjusted* $R^2$ | 0.334 | 0.238 | 0.224 | 0.238 |
| F | 15.50(0.00) | 8.022(0.00) | - | 18.025(0.00) |
| Wald Test | - | - | 19.27(0.00) | - |
| Hausman Test | - | 1.83(0.784) | - | - |
| Bresuch-Pagan RE | - | - | 28.09(0.00) | - |
| Test | - | 420.53(0.00) | - | - |
| Heteroscedasticity | - | 2.31 (0.172) | - | - |
| Test | 88 | 88 | 88 | 88 |
| Serial Correlation Test | | | | |
| Observations | | | | |

**Interpretation**

The results show that total debt to equity, sales growth and asset tangibility have positive relationship with firm performance proxied with the ZSCORE. In addition, there is evidence that there is significant relationship between total debt to equity and sales growth and the performance of oil and gas companies in Nigeria (TDE= 0.231, *t*-test= 2.569, $p < 0.05$ and SGROWTH = 0.457, *t*-test = 2.277, $p < 0.05$) and the Adjusted $R^2$ is about 22 per cent. This implies that total debt to equity and sales growth were significant factors influencing changes in the performance of oil and gas firms in Nigeria. In sharp contrast, asset tangibility does not have significant relation with oil and gas firms' performance in Nigeria (ASTANG= 2.667, *t*-test= 1.805, $p > 0.05$). This implies that asset tangibility is not among the significant factors influencing changes in oil and gas companies' financial performance in Nigeria.

**Table 1B: Regression for Capital Structure (Total Debt /Equity) and Corporate Financial Performance.**

**Dependent Variable: Interest Cover**

**Estimation model: Driscolli-Kraay**

| **Panel A: Variables** | Pooled OLS | Fixed Effect | Random Effect | **Driscolli-Kraay** |
|---|---|---|---|---|
| TDE | 0.083 | 0.043 | 0.083 | 0.043** |
| | (0.806) | (0.350) | (0.806) | (2.076) |
| SGROWTH | 0.380 | 0.389 | 0.380 | 0.389** |
| | (1.578) | (1.478) | (1.578) | (2.916) |

| | | | | |
|---|---|---|---|---|
| ASTANG | 0.090<br>(0.061) | 1.890<br>(0.855) | 0.090<br>(0.061) | 1.890<br>(0.893) |
| Constant | 1.521***<br>(3.891) | 1.141**<br>(2.034) | 1.521***<br>(3.891) | 1.141*<br>(2.060) |
| **Panel B: Diagnostic Tests** | | | | |
| *Adjusted* $R^2$ | 0.205 | 0.244 | 0.235 | 0.244 |
| F | 20.17(0.00) | 21.84(0.00) | - | 137.04(0.00) |
| Wald Test | - | - | 13.52(0.00) | - |
| Hausman Test | - | 24.28 | - | - |
| Bresuch-Pagan RE Test | - | - | 0.76(0.957) | - |
| Heteroscedasticity Test | - | 8231.68(0.00) | - | - |
| Serial Correlation Test | - | 11.53(0.01) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Interest Cover: 1.141 + 0.043TD/E + 0.389SG + 1.890AST

**Interpretation**

The results showed that total debt to equity, sales growth and asset tangibility have positive relationship with firm performance proxied with the INTCOVER within oil and gas firms in Nigeria. In addition, there is evident significant relationship between total debt to equity and sales growth have and the performance of oil and gas companies (TDE= 0.043, *t*-test= 2.076, $p < 0.05$ and SGROWTH = 0.389, *t*-test = 2.916, $p < 0.05$) and Adjusted $R^2$ of 24 per cent. This implies that total debt to equity and sales growth were significant factors influencing changes in oil and gas companies' performance in Nigeria. In sharp contrast, asset tangibility does not have significant relation with oil and gas companies' performance in Nigeria (ASTANG= 1.890, *t*- test= 0.893, $p > 0.05$). This implies that asset tangibility is not a significant factor influencing changes in oil and gas companies' performance in Nigeria.

**Research Question II**

The purpose of this research question was to ascertain how total debt-to-total asset impacts on the financial performance of companies in the downstream oil and gas sector of Nigeria. The associated hypothesis states that there is no significant effect of total debt-to-total assets ratio on the financial performance of oil and gas downstream companies in Nigeria. The aim of this research question was to ascertain the impact of total debt-to-total assets (TDTA) ratio on financial performance of oil and gas downstream companies in Nigeria. The tables below reflect the output of the study computation.

**Table 2A: Regression for Capital Structure (Total Debt/Total Asset) and Corporate Financial Performance**

**Dependent Variable: ZSCORE**

**Estimation Model: Random Effect.**

| **Panel A: Variables** | Pooled OLS | Fixed Effect | **Random Effect** | Driscolli-Kraay |
|---|---|---|---|---|
| TDTA | -0.827 | -2.494*** | -1.434 | -2.494*** |
| | (-0.849) | (-2.872) | (-1.550) | (-6.277) |
| SGROWTH | 0.653*** | 0.221 | 0.498** | 0.221 |
| | (2.733) | (1.016) | (2.173) | (0.931) |
| ASTANG | 3.123** | 3.454** | 3.057** | 3.454* |
| | (2.408) | (2.032) | (2.216) | (2.177) |
| Constant | 2.787*** | 3.945*** | 3.252*** | 3.945*** |
| | (3.373) | (5.311) | (4.053) | (12.448) |
| **Panel B: Diagnostic Tests** | | | | |
| *Adjusted* $R^2$ | 0.137 | 0.193 | 0.170 | 0.193 |
| F | 5.596(0.00) | 6.126(0.00) | - | 58.776(0.00) |
| Wald Test | - | - | 16.44(0.00) | - |
| Hausman Test | - | 0.33(0.982) | - | - |
| Bresuch-Pagan RE Test | - | | 28.04(0.00) | - |
| Heteroscedasticity Test | - | 672.88(0.00) | - | - |
| Serial Correlation Test | - | 3.63(0.09) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Z score: 3.252 -1.434TD/TA + 0.498SG + 3.057AST

**Interpretation**

The results show that sales growth and asset tangibility have positive relationship with firm performance proxy with the ZSCORE within oil and gas firms in Nigeria; there was negative relationship between total debt to total asset and firm performance. In addition, there is evident significant relationship between sales growth and asset tangibility and the financial performance of oil and gas firms in Nigeria (SGROWTH= 0.498, *t*-test= 2.173, $p < 0.05$ and ASTANG = 3.057, *t*-test = 2.216, $p < 0.05$) and Adjusted $R^2$ of 17 percent. This implies that sales growth and asset tangibility were significant factors influencing changes in the financial performance of oil and gas firms in Nigeria. Conversely, total debt to total asset, do not have significant relation with the performance of oil and gas firms in Nigeria (TDTA= -1.434, *t*-test= 1.550, $p > 0.05$). This implies that total debt to total asset, is not a significant factor influencing changes in oil and gas companies' performance in Nigeria.

**Table 2B: Regression for Capital Structure (Total Debt /Total Asset) and Corporate Financial Performance (INTCOVER)**

**Dependent Variable: INTCOVER**

**Estimation Model: Pooled OLS**

| **Panel A: Variables** | **Pooled OLS** | Fixed Effect | Random Effect | Driscolli-Kraay |
|---|---|---|---|---|
| TDTA | -2.032* | -1.783 | -2.032* | -1.783** |
| | (-1.951) | (-1.599) | (-1.951) | (-2.619) |
| SGROWTH | 0.405** | 0.214 | 0.205 | 0.214 |
| | (2.601) | (0.767) | (0.801) | (1.464) |
| ASTANG | 0.665*** | 2.125 | 0.165 | 2.125 |
| | (3.561) | (0.974) | (0.119) | (1.125) |
| Constant | 3.061*** | 2.430** | 3.061*** | 2.430*** |
| | (3.465) | (2.548) | (3.465) | (9.267) |
| **Panel B: Diagnostic Tests** | 0.242 | 0.173 | 0.363 | 0.173 |
| Adjusted $R^2$ | | | | |
| F | 22.26(0.00) | 22.03(0.00) | - | 13.833(0.00) |
| Wald Test | - | - | 16.78(0.00) | - |
| Hausman Test | - | 3.52(0.32) | - | - |
| Bresuch-Pagan RE Test | - | - | 0.68(0.984) | - |
| Heteroscedasticity Test | - | 4854.21(0.00) | - | - |
| Serial Correlation Test | - | 6.55(0.04) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Interest Cover: 3.061 -2.032TD/TA + 0.405SG + 0.665AST

**Interpretation**

The results show that sales growth and asset tangibility have positive relationship with firm performance proxy with the INTCOVER within oil and gas companies in Nigeria; while there is a negative relationship between total debt to total asset and firm performance. In addition, there is evident significant relationship between sales growth and asset tangibility and financial performance of oil and gas firms in Nigeria (SGROWTH= 0.405, *t*-test= 2.601, $p < 0.05$ and ASTANG = 0.665, *t*-test = 3.561, $p < 0.05$) and Adjusted $R^2$ of 24 percent. This implies that sales growth and asset tangibility were significant factors influencing changes in the performance of oil and gas firms in Nigeria. Conversely, total debt to total asset, do not have significant relation with oil and gas companies' performance in Nigeria (TDTA= -2.032, *t*- test= 1.951, $p > 0.05$). This implies that total debt to total asset, is not a significant factor influencing changes in firm performance of oil and gas companies in Nigeria.

**Research Question III**

The essence of this research question was to examine the extent to which long term debt-to-total assets ratio affects oil and gas downstream companies' financial performance in Nigeria. The correlated hypothesis showed a non-significant effect of long-term debt-to-total assets ratio on financial performance of oil and gas downstream firms in Nigeria. The Objective of this research question was to evaluate the impact of long-term debt-to-total assets (LTDTA) ratio on oil and gas downstream companies' financial performance in Nigeria. The tables below present the related data from the analysis.

**Table 3A: Regression for Capital Structure (Long Term Debt/Total Asset) and Corporate Financial Performance**

**Independent V**ariable: ZSCORE

**Estimation Model**: Random Effect

| **Panel A: Variables** | Pooled OLS | Fixed Effect | **Random Effect** | Driscolli-Kraay |
|---|---|---|---|---|
| LTDTA | -3.998*** | -3.337*** | -3.505*** | -3.337*** |
| | (-4.070) | (-3.120) | (-3.486) | (-3.823) |
| SGROWTH | 0.321 | 0.218 | 0.244 | 0.218 |
| | (1.424) | (1.026) | (1.163) | (1.321) |
| ASTANG | 4.876*** | 3.324* | 3.888*** | 3.324** |
| | (3.898) | (1.975) | (2.666) | (2.456) |
| Constant | 2.428*** | 2.684*** | 2.580*** | 2.684*** |
| | (7.225) | (5.988) | (5.273) | (5.771) |
| **Panel B: Diagnostic Tests** | | | | |
| Adjusted $R^2$ | 0.273 | 0.206 | 0.206 | 0.207 |
| F | 11.88(0.00) | 6.68(0.00) | - | 14.292(0.00) |
| Wald Test | - | - | 25.34(0.00) | - |
| Hausman Test | - | 2.57(0.46) | - | - |
| Bresuch-Pagan RE Test | - | - | 11.80(0.00) | - |
| Heteroscedasticity Test | - | 243.08(0.00) | - | - |
| Serial Correlation Test | - | 3.851(0.09) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Z score: 2.580 -3.505LTD/TA + 0.244SG +3.888AST

**Interpretation**

The results show that; sales growth and asset tangibility have positive relationship with firm performance proxy with the Z SCORE within oil and gas companies in Nigeria; there is negative relationship between long-term debt to total asset and firm performance. In addition, there is evident significant relationship between financial performance and long-term debt to

total asset and asset tangibility of oil and gas firms in Nigeria (LTDTA= -3.505, *t*-test= -3.486, $p < 0.05$ and ASTANG = 3.888, *t*-test = 2.666, $p < 0.05$) and Adjusted $R^2$ 21 percent. This implies that long-term debt to total asset and asset tangibility were significant factors influencing changes in oil and gas companies' performance in Nigeria. Conversely, sales growth does not have significant relationship with oil and gas companies' performance in Nigeria (SGROWTH= 0.244, *t*- test= 1.163, $p > 0.05$). This implies that sales growth is not a significant factor influencing changes in oil and gas companies' performance in Nigeria.

**Table 3B: Regression for Capital Structure (Long Term Debt /Total Asset) and Corporate Financial Performance.**

**Dependent Variable: Interest Cover**

**Estimation Model: Pooled OLS**

| **Panel A: Variables** | **Pooled OLS** | Fixed Effect | Random Effect | Driscolli-Kraay |
|---|---|---|---|---|
| LTDTA | 1.475 | 1.175 | 1.405 | 1.175 |
| | (1.274) | (0.839) | (1.191) | (1.020) |
| SGROWTH | 0.555** | 0.515* | 0.548** | 0.515** |
| | (2.087) | (1.845) | (2.058) | (2.592) |
| ASTANG | -0.169 | 1.810 | 0.010 | 1.810 |
| | (-0.115) | (0.821) | (0.006) | (0.830) |
| Constant | 1.407*** | 1.003* | 1.378*** | 1.003 |
| | (3.551) | (1.708) | (3.266) | (1.535) |
| **Panel B: Diagnostic Tests** | | | | |
| Adjusted $R^2$ | 0.217 | 0.251 | 0.243 | 0.251 |
| F | 21.51(0.00) | 22.39(0.00) | - | 42.93(0.00) |
| Wald Test | - | - | 24.38(0.00) | - |
| Hausman Test | - | 1.89(0.60) | - | - |
| Bresuch-Pagan RE Test | - | - | 0.15(0.35) | - |
| Heteroscedasticity Test | - | 7770.05(0.00) | - | - |
| Serial Correlation Test | - | 18.24(0.00) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Interest Cover: 1,407 + 1.475LTD/TA + 0.555SG -0.169AST

**Interpretation**

The results show a positive relationship between long-term debt to total asset and sales growth and firm performance proxy with the INTCOVER within oil and gas firms in Nigeria, while a negative relationship exists between asset tangibility and firm performance. In addition, there is evidence that only sales growth has significant relationship with oil and gas companies' performance in Nigeria (SGROWTH= 0.555, *t*- test= 2.087, $p < 0.05$). This implies that sales growth is a significant factor influencing changes in the oil and gas

companies' performance in Nigeria. Conversely, there is no significant relation of long-term debt to total asset and asset tangibility with firm performance of oil and gas companies in Nigeria (LTDTA= 1.475, *t*-test= 1.274, p > 0.05 and ASTANG = -0.169, *t*-test = -0.115, p > 0.05) and Adjusted $R^2$ 22 percent. This implies that long-term debt to total asset and asset tangibility were not significant factors influencing changes in oil and gas companies' performance in Nigeria.

**Research Question IV**

Research question IV is an attempt to determine the impact of short-term debt-to-total assets ratio on financial performance of oil and gas downstream companies in Nigeria. The related hypothesis was that there is no significant effect of short-term debt-to-total assets ratio on financial performance of oil and gas downstream companies in Nigeria. The overall objective was to explore the impact of short-term debt-to-total assets (STDTA) ratio on oil and gas downstream companies' financial performance in Nigeria. The tables below present the data analysis of the findings.

**Table 4A: Regression for Capital Structure (Short Term Debt/Total Asset) and Corporate Financial Performance**

**Dependent Variable: ZSCORE**

**Estimation Model: Driscoll-Kraay**

| **Panel A: Variables** | Pooled OLS | Fixed Effect | Random Effect | **Driscolli-Kraay** |
|---|---|---|---|---|
| STDTA | 2.173** | -0.943 | 1.043 | -0.943 |
| | (2.318) | (-0.722) | (1.000) | (-1.023) |
| SGROWTH | 0.721*** | 0.478** | 0.618*** | 0.478** |
| | (3.373) | (2.314) | (2.991) | (1.930) |
| ASTANG | 4.508*** | 3.163* | 3.533** | 3.163** |
| | (3.288) | (1.777) | (2.361) | (2.548) |
| Constant | 0.610 | 2.726*** | 1.490* | 2.726*** |
| | (0.811) | (3.160) | (1.825) | (10.319) |
| **Panel B: Diagnostic Tests** | | | | |
| Adjusted $R^2$ | 0.210 | 0.212 | 0.291 | 0.212 |
| F | 27.44(0.00) | 23.24(0.00) | - | 74.65(0.00) |
| Wald Test | - | - | 33.85(0.00) | - |
| Hausman Test | - | 13.27(0.00) | - | - |
| Bresuch-Pagan RE Test | - | - | 5.71(0.00) | - |
| Heteroscedasticity Test | - | 646.34(0.00) | - | - |
| Serial Correlation Test | - | 4.23(0.08) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Z score: 2.726 -0.943STD/TA + 0.478SG + 3.163AST

**Interpretation**

The results show that sales growth and asset tangibility have positive relationship with firm performance proxy with the ZSCORE within oil and gas companies in Nigeria; while a negative relationship exists between short-term debt to total asset and firm performance. In addition, there is evidence that only sales growth and asset tangibility have significant relationship with oil and gas firms' performance in Nigeria (SGROWTH= 0.478, *t*- test= 1.930, $p < 0.05$ and ASTANG = 3.163, *t*-test = 2.548, $p < 0.05$) and Adjusted $R^2$ of 21 percent. This implies that sales growth and asset tangibility were significant factors influencing changes in oil and gas firms' performance in Nigeria. Conversely, short-term debt to total asset does not have a significant relation with oil and gas companies' performance in Nigeria (STDTA= -0.943, *t*-test= -1.023, $p > 0.05$). This implies that short-term debt to total asset is not a significant factor influencing changes in oil and gas companies' performance in Nigeria.

**Table 4B: Regression for Capital Structure (Short Term Debt /Total Asset) and Corporate Financial Performance**

**Dependent Variable: Interest Cover**

**Estimation Model: Driscoll-Kraay**

| **Panel A: Variables** | Pooled OLS | Fixed Effect | Random Effect | **Driscolli-Kraay** |
|---|---|---|---|---|
| STDTA | -3.340*** | -5.659*** | -3.340*** | -5.659*** |
| | (-3.384) | (-3.793) | (-3.384) | (-6.530) |
| SGROWTH | 0.423* | 0.269 | 0.423* | 0.269 |
| | (1.879) | (1.141) | (1.879) | (1.790) |
| ASTANG | -1.520 | 2.168 | -1.520 | 2.168 |
| | (-1.053) | (1.066) | (-1.053) | (1.227) |
| Constant | 3.882*** | 4.382*** | 3.882*** | 4.382*** |
| | (4.901) | (4.446) | (4.901) | (5.692) |
| **Panel B: Diagnostic Tests** | | | | |
| Adjusted $R^2$ | 0.118 | 0.193 | 0.135 | 0.193 |
| F | 4.90(0.00) | 6.15(0.00) | - | 60.82(0.00) |
| Wald Test | - | - | 14.68(0.00) | - |
| Hausman Test | - | 8.84(0.03) | - | - |
| Bresuch-Pagan RE Test | - | - | 0.65(0.90) | - |
| Heteroscedasticity Test | - | 2298.10(0.00) | - | - |
| Serial Correlation Test | - | 13.49(0.00) | - | - |
| Observations | 88 | 88 | 88 | 88 |

Interest cover: 4.382 -5.659STD/TA + 0.269SG + 2.168 AST

**Interpretation**

The results show that sales growth and asset tangibility have positive relationship with firm performance proxy with the INTCOVER among oil and gas companies in Nigeria; while there is a negative relationship between short-term debt to total asset and firm performance. In addition, there is evidence that only short-term debt to total asset has a significant relation with oil and gas companies' performance in Nigeria (STDTA= -5.659, *t*-test= -6.530, $p < 0.05$ and Adjusted $R^2$ of 17 percent. This implies that short-term debt to total asset is a significant factor influencing changes in oil and gas companies' performance in Nigeria. In sharp contrast, there is evidence that sales growth and asset tangibility do not have significant relationship with oil and gas companies' performance in Nigeria (SGROWTH= 0.269, *t*-test= 1.790, $p > 0.05$ and ASTANG = 2.168, *t*-test = 1.227, $p > 0.05$). This implies that sales growth and asset tangibility were not significant factors influencing changes in the performance of oil and gas firms in Nigeria.

**Discussion of Findings**

Based on the regression of the hypothesis tested, the following are the summary of the empirical findings:

1.) The ratio of total debt-to-equity positively and significantly relates with the financial performance of selected firms in the oil and gas sector of Nigeria. This is in agreement with the a priori expectation of the work.

2.) The ratio of total debt-to-total assets negative and insignificant relates with the financial performance of selected firms in the oil and gas sector of Nigeria. This finding also agrees with the a priori expectation.

3.) The ratio of long-term debt-to-total assets positive and significantly relates with the financial performance of selected firms in the oil and gas sector of Nigeria. This result is also in tandem with the a priori expectation of the research.

4.) The ratio of short-term debt-to-total assets ratio has negative and significant relationship with the financial performance of selected firms in the oil and gas sector of Nigeria. This finding does not agree with the a priori expectation of the study.

5.) With interest cover mean value of 1.63, it shows that on the average, oil and gas firms in Nigeria generate enough cash needed for interest charge obligations while the 'z' score mean value of 2.92 shows that Nigerian oil and gas companies are safe from bankruptcy and insolvency but there is need for caution to avoid any slide in their fortunes.

6.) Despite the impressive mean values of 1.626 for interest cover, 2.928 for Z score, the Nigerian oil and gas companies recorded mean v 0.045 for sales growth. This shows that

there is low productivity and that the liquidity advantages are being channelled to paying debts with the mean value 0.813 for total debt-to-equity.

The results of this study showed that total debt to total equity and long-term debt-to-total assets have positive significant relationship with financial performance of the listed oil and gas downstream companies selected for this study. In contrast, the study found that total debt-to-total assets is positive but statistically insignificant. This study is in conformity with the work of Muritala and Oguntade (2013), Vatavu (2015), Akingunola, Olawale and Olaniyan (2017), Oyedokun, Job-Olatunji and Sanyaolu (2018), Ruri, and Omagwa (2018), Etale and Uzakah (2019) and Nelson and Peter (2019).

In addition, the findings of this study are in tandem with the work of Abdul and Adelabu (2015) who examined financial leverage impact on financial performance with emphasis on Total Nigeria Plc, a major downstream oil and gas company in Nigeria between 2004 -2007. Their results show that financial leverage positively and significantly relates with the financial performance of Total Plc. On the other hand, short term debt-to-total asset exhibited a negative and significant relationship with financial performance. This result agrees with the study of Akeem, Terer, Kiyanjui, and Kayode (2014), Ikpefan and Olokoyo (2015), Schulz (2017), Neru, Vintila and Gherghina (2018), Ho, Nguyen and Nguyen (2019) and Wu (2019).

## Conclusion

In this study, the capital structure impact measured in terms of total debt-to-equity and long-term debt-to-total assets ratios on the financial performance of oil and gas firms in Nigeria has established positive and significant results while the total debt-to-assets recorded a positive but insignificant result. This agrees with the trade- off capital structure theory which encourages the use of more debt capital and the pecking order theory which advocates the use of debt capital at a point in the development of the firm where internal funding becomes inadequate for the growth of the business. However, capital structure impact, measured in terms of short-term debt-to-total assets, on the financial performance of Nigerian oil and gas firms showed a negative and significant result. Furthermore, the firm-characteristic of sales growth was discovered to be almost consistently positive to financial performance in all the models even with the minimal average sales growth of about 4%. This suggests that if the firms had recorded higher productivity, their performance would have been better. It therefore underscores the urgent need for more investments in productive and quality assets to enhance capacity for more productivity in terms of increased turnover.

## Recommendations

The findings of this research have provided enough proof to support the fact that the capital structure plays a key role in improving the financial performance of quoted oil and gas companies in Nigeria. This study therefore proffers the following recommendations:

(a. The firms must increase the use of long- term funds and discourage the use of short- term finance which is discovered to form huge part of the liabilities of most of the companies.

(b. Where short term funds must be sourced, it must be strictly for trading and office running purposes and should not be applied to long term projects.

(c. The owners of the businesses must endeavour to inject more equity capital into the business. The total debt to equity ratio of 0.81 is considered too high. The business must not be run practically by debt finance otherwise the optimal capital structure threshold will be exceeded.

(d. The oil and gas companies are also advised to increase their investment in quality assets to enhance their earning capacity.

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