Capital Structure and Financial Performance of Firms in Nigeria's Oil and Gas Sector

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Abstract

The impact of capital structure on financial performance is crucial to financial management decisions. Determining the relationship between capital structure and different proxies of financial performance enables financial managers to make strategic and targeted decisions to improve firm profitability. However, there are conflicting results regarding the relationship between capital structure and financial performance. This study determined the extent of financial leverage and the impact of capital structure on the financial performance of eight Nigerian publicly listed oil and gas companies from 2011 to 2020. Fixed and random panel regression models were developed to investigate this relationship. The study used different proxies of financial performance, including return on assets (ROA), return on equity (ROE), and earnings per share (EPS), to show that the combination of capital structure affecting ROA has a different impact on ROE and the most significant impact on EPS, thus highlighting the effect of capital structure on shareholders' equity. The results on the extent and trend of financial leverage in the sampled companies also indicate that lower leverage ratios are generally associated with better financial performance. However, efficient management of high leverage can also lead to strong financial outcomes, as demonstrated by TotalEnergies. These insights hold significant policy implications for managers of oil and gas companies listed on the Nigerian Exchange Group, helping them formulate targeted strategies to improve financial performance.

Keywords: Capital Structure, Financial Performance, listed firms, Return on Assets, Return on Equity, Earnings per Share.

1. Introduction

The 1950s marked a pivotal era for Nigeria with the discovery and subsequent exploitation of crude oil, propelling the nation to become Africa's second-largest oil producer and the eleventh globally by 2019, with an average daily production of over 2 million barrels. This growth underscored the indispensable role of Nigeria's oil and gas sector, contributing approximately 9% to the Gross Domestic Product (GDP) and accounting for over 90% of total export earnings (Varrella, 2020) [1].

Listed firms on the Nigerian Exchange Group pool shareholder resources to maximize profit and wealth, a responsibility that drives managers to pursue optimal financial performance for sustained growth and shareholder benefit. Effective management practices are crucial in achieving these goals.

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Capital structure refers to the strategies employed by firms to finance assets, growth, and operations through a good combination of debt and equity. It is a mix of long-term financing options such as common stock equity, preferred stock, and debt. Thus, a firm can increase its stock price, maximize its market value and improve competitive advantages by minimizing the cost of capital through an optimal capital structure (Van Horne & Wachowicz, 2005; Riaz, 2015) [2-3].

Finance literature posits that while leverage may not directly impact a firm's total earnings, it significantly affects shareholders' equity, the provider of the funds. Igbinosa (2015) [4] concludes that firms often utilize long-term debt initially to enhance profitability, subsequently transitioning to internal funding as profitability improves, thereby reducing reliance on debt. As firms become more profitable, they tend to decrease their use of short-term debt for asset financing. Gu and Ku (1997) [5] similarly conclude that firms prioritize internal funding, followed by external short-term and long-term debt, before resorting to equity funding to finance expansion. The optimal capital structure is crucial as an inappropriate mix can negatively impact a firm's survival and performance, with higher debt ratios particularly affecting financial measures (Chinaemerem & Anthony, 2012) [6].

Financial performance quantitatively measures how effectively a company utilizes its assets to generate revenues over a specific period (Diez-Busto, San-Martín, & Pérez, 2021) [7]. It serves as a metric for comparing sectors, firms within the same industry, or industries across different countries. Various ratios such as Earnings before Interest and Taxes (EBIT), net income, Return on Assets (ROA), Return on Equity (ROE), Earnings Per Share (EPS), stock market returns, stock volatility, and Tobin’s Q ratio are used to assess financial performance (Guillermet & Taïlé, 2014) [8].

This study empirically explores the relationship between capital structure and financial performance among listed oil and gas firms in Nigeria. Existing research presents conflicting findings without reaching a consensus on the nature of this relationship. Theoretical frameworks including Modigliani & Miller's Irrelevance Theory of Capital Structure, Trade-off Theory, Pecking Order Theory, and Agency Cost Theory offer diverse perspectives on how capital structure shapes financial outcomes. Globally, empirical studies yield varied results, indicating both negative (e.g., Segun, Akindutire,

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& Thomas, 2021; Alalade, Ogbebor, & Nyaudo, 2020; Bui & Nguyen, 2020; Basit & Irwan, 2017) [9-12] and positive relationships (e.g., Ali, 2016; Ali, Zia & Razi, 2012) [13-14].

Given the substantial contribution of crude oil revenue to Nigeria's federal income, further investigation into the capital structure and financial performance nexus in this context is imperative.

2. Literature Review

Theoretical Review

The concept of capital structure and its impact on financial performance is supported by several key financial management theories, particularly the irrelevance theory, trade-off theory, pecking order theory, and agency theory.

Irrelevance Theory

Modigliani and Miller (1958) [15] pioneered the discussion on firm capital structure with the irrelevance theory, positing that under certain conditions, the financing mix between debt and equity has no effect on a firm's value. This theory rests on assumptions such as no impact of debt on a company's earnings before interest and taxes, a world without taxes, no transaction costs, no bankruptcy costs, equivalent borrowing costs for firms and investors, no information asymmetry, homogeneous risk among investors, perfect markets, risk-free debt interest rates, and perpetual cash flows.

Modigliani and Miller proposed that:

a) The value of a firm is independent of its capital structure.
b) Financial leverage increases expected earnings per share while keeping the share price constant.
c) Investment financed by common stock benefits current shareholders only if its yield exceeds the capitalization rate.

However, their theory has faced criticism due to its reliance on the perfect market assumption, which is unrealistic in practice due to imperfections such as bankruptcy costs, taxes, agency costs, and information asymmetry. These imperfections prompted further research into the relationship between financial leverage and firm performance.

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Modigliani and Miller (1963) [16] later revised their theory to include corporate income taxes, acknowledging that interest on debt is tax-deductible. They argued that the value of a firm is influenced by leverage and the tax rate, as debt financing offers tax advantages. However, this benefit can be complicated by personal taxes (Miller, 1977) [17] and non-debt tax shields (DeAngelo & Masulis, 1980) [18]. Castanias (1983) [19] provided empirical evidence that contradicted the tax shelter-bankruptcy cost hypothesis, challenging aspects of Modigliani and Miller's original assumptions.

Subsequent developments extended the Modigliani and Miller theory by considering internal funding preferences, absence of information asymmetry, and the profitability advantage of less leveraged firms (Myers & Majluf, 1984) [20].

Trade-off Theory

According to Myers (1984) [21], a firm following the trade-off theory sets a target debt-to-value ratio and gradually moves towards this target. The target is determined by balancing the tax benefits of using debt against the costs of financial distress, which rise at an increasing rate with higher leverage. This theory predicts that a moderate amount of debt is optimal. However, empirical evidence suggests that the most profitable firms in an industry tend to borrow the least, despite having a low probability of financial distress. This observation contradicts the trade-off theory because if the distress risk is low, increasing debt should have a favorable tax effect. Under the trade-off theory, high profits should correlate with a higher debt-servicing capacity and more taxable income to shield, resulting in a higher debt ratio.

This idea has been further developed in various papers, including those by Brennan and Schwartz (1978), DeAngelo and Masulis (1980), and Bradley, Jarrell, and Kim (1984) [22,18,23]. Despite this, the theory has been questioned by others, including Miller (1977) [24], who argue that the static trade-off model implies that many firms should be more highly leveraged than they are. The tax savings of debt seem significant, while the costs of financial distress appear minor. Several studies have explored this, although few offer conclusive support for the trade-off theory.

Pecking Order Theory

The pecking order theory suggests that firms prefer internal financing (retained earnings or excess liquid assets) over external financing. When internal funds are insufficient,

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firms will choose external finance sources to minimize costs associated with asymmetric information. Myers and Majluf (1984) [20] argued that if investors are less informed than firm managers, equity might be mispriced, leading to underinvestment in positive NPV projects. This issue can be avoided by using internal funds or low-risk debt, which are not undervalued by the market.

Myers (1984) [21] describes the pecking order theory as a preference for financing new investments first internally, then with low-risk debt, and finally with equity as a last resort. Firms retain profits and build financial slack to avoid raising external finance. The theory also considers the market-to-book ratio as an indicator of investment opportunities, noting that high investment opportunities may push leverage higher toward debt capacity.

The pecking order theory highlights the costs of asymmetric information between managers and the market, suggesting that these costs are more significant than the trade-off theory's costs and benefits of debt financing. Developing a pecking order based on adverse selection costs requires specifying the manager's incentive contract and limiting financing strategies (Brennan & Kraus, 1987) [22].

Agency Cost Theory

Alchian and Demsetz (1972) and Jensen and Meckling (1976) [25,26] describe the firm as a nexus of contracts among production factors, this led to the birth of the agency cost theory. The firm is a legal fiction where individuals' conflicting objectives are balanced through contracts with employees, suppliers, customers, and creditors. These contracts aim to motivate all parties to maximize organizational value, reducing agency costs and using efficient accounting methods.

The separation of ownership and management can lead to managers acting in their own interests rather than maximizing shareholder wealth, necessitating monitoring mechanisms to protect shareholders (Jensen & Meckling, 1976) [26]. This agency problem results in costs, such as monitoring expenses and bonding expenditures by agents to ensure their actions do not harm principals, as well as residual losses from divergent decisions (Jensen & Meckling, 1976) [26].

Jensen and Meckling (1976) [26] identify two types of conflicts: between shareholders and managers, and between debt holders and equity holders. High financial leverage may lead to lower performance due to agency issues (Gleason, Mathur, & Mathur, 2000) [28].

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However, Berger and Bonaccorsi di Patti (2006) [28] argue that higher leverage can reduce agency costs by threatening liquidation, aligning managers' interests with equity holders, and mitigating conflicts over investment choices and risk (Harris & Raviv, 1990) [29].

Empirical Review

Segun et al., (2021) [9] examined capital structure and financial performance of firms in Nigeria's oil and gas sector. Using an ex-post facto research design, they sampled 10 out of 12 listed firms from 2010-2019. Regression analysis showed total debt ratio, long-term debt ratio, and short-term debt ratio negatively affected return on assets (ROA), but only the short-term debt ratio had a significant negative effect. Capital structure's effect on return on equity (ROE) was significant, suggesting financial managers should balance equity and debt to improve profitability.

Alalade, Ogbebor, and Nyaudo (2020) [10] investigated capital structure's impact on profitability in Nigeria's downstream oil and gas sector from 2000-2018. Using dynamic panel system equations, they found that debt capital ratio negatively and significantly affected profitability, while equity capital ratio had a positive and significant effect. Interest rate had a positive but insignificant effect on ROA. They recommended increasing equity financing through retained earnings and reducing debt financing.

Bui and Nguyen (2020) [11] studied profitability in Vietnam's oil and gas sector from 2012-2018. Analyzing 203 samples from 29 companies, they found that leverage and exchange rates negatively affected ROA, while government ownership and dividend payments had positive effects. They suggested managing high debt ratios and exchange rate impacts to optimize profitability.

Abosede (2020) [30] examined the impact of indebtedness on the performance of Nigerian downstream oil and gas companies from 2007-2019. Using multiple regressions, the study found that long-term debt significantly and negatively affected financial performance. The study recommended effectively using long-term debt to enhance capital employed and increase return on investment.

Ali (2016) [13] analyzed the influence of capital structure on stock returns in Pakistan's oil and gas sector from 2005-2014. Using correlation and regression models, the study found that debt to equity ratio and financial leverage positively affected stock returns.

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Myhre (2016) [31] explored capital structure determinants in oil and gas companies over 17 years, using firm-specific and macroeconomic factors in a panel data regression model. The results indicated that firm size and tangibility were prominent factors, with GDP growth rate and lagged term spread as influential macroeconomic factors. The trade-off theory dominated, followed by pecking order theory for firm-specific factors, while a combination of pecking order theory and market timing theory explained macro factors.

Manikom and Guillermet (2015) [32] studied the relationship between crude oil prices and financial performance of International Oil Companies (IOCs) in the Eurozone from 2004-2013. Using multiple regression with panel data, they found crude oil prices negatively impacted financial performance ratios (ROA, ROE, Profit Margin) and that debt level and IOC size had a strong relationship with financial performance.

Tailab (2014) [33] analyzed capital structure's effect on financial performance in American energy firms from 2005-2013. Using multiple regressions, the study found total debt significantly negatively impacted ROE and ROA, while firm size negatively affected ROE. Short-term debt positively influenced ROE. Long-term debt, debt to equity ratio, and size in terms of total assets had an insignificant relationship with profitability.

3. METHODOLOGY

The research adopted a basic and ex-post facto research design using panel data, as it combined time series and cross-sectional data for sampled oil and gas firms over a ten-year period (2011-2020). This approach allowed for the analysis of trends over time. To achieve the study's objectives, data were gathered on independent variables (capital structure represented by debt ratio, equity ratio, debt-to-equity ratio, long-term debt ratio, and size) and dependent variables (financial performance represented by return on assets (ROA), return on equity (ROE), and earnings per share (EPS)) from the financial statements of the sampled firms.

The population comprised all oil and gas firms quoted on the Nigerian Exchange Group (NGX) during the study period, totaling eleven firms. A purposive sampling technique was used to select eight companies with complete and available data, and whose stocks were actively traded during the sample period. The selected period started in the year following the change in accounting reporting standards for oil and gas.

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Model Specification and Measurement of Variables

To measure the extent of financial leverage among quoted oil and gas firms, one measure of financial leverage was utilized.

The ratio of total debt to total assets:

$$FL = \frac{TD}{TA}$$

To Examine the Effect of Capital Structure on financial performance, three models were propounded as follows:

A panel least square model was employed to achieve this objective, and this is stated thus:

$$ROA_{IT} = \alpha_0 + \beta_1 DR_{it} + \beta_2 EQR_{it} + \beta_3 DER_{it} + \beta_4 LTD_{it} + \beta_5 SIZE_{it} + \varepsilon_{it} \quad (1)$$

$$ROE_{IT} = \alpha_0 + \beta_1 DR_{it} + \beta_2 EQR_{it} + \beta_3 DER_{it} + \beta_4 LTD_{it} + \beta_5 SIZE_{it} + \varepsilon_{it} \quad (2)$$

$$EPS_{IT} = \alpha_0 + \beta_1 DR_{it} + \beta_2 EQR_{it} + \beta_3 DER_{it} + \beta_4 LTD_{it} + \beta_5 SIZE_{it} + \varepsilon_{it} \quad (3)$$

Where:

ROA_{IT} = return on assets as a measure of performance.

ROE_{IT} = Return on Equity as a measure of performance

EPS_{IT} = Earnings per share as a measure of performance

α = a constant i.e., the value of profit after tax when all the independent variables are zero

$\beta_1 - \beta_5$ = independent variables' regression slopes

DR = Debt Ratio

EQR = Equity Ratio

DER = Debt to Equity Ratio

LTD = Long Term Debt

SIZE = Size of the Firm

ε = error term, which is zero, has a constant variance and is non-auto correlated

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4. Results and Discussion

Table 1. Descriptive Statistics

	ROA	ROE	EPS	DR	EQR	DER	SIZE	LTD
Mean	0.0308	22.2142	12.4827	0.6928	0.02702	274.0024	17.7522	0.0947
Median	0.0332	3.1094	1.495	0.6797	0.0050	129.8063	17.9064	0.0000
Maximum	1.7507	412.4948	217.09	2.4787	0.2006	2315.7	20.9939	1.5842
Minimum	-0.7160	-160.3675	-45.72	0.1729	0.0002	1.5056	14.6221	0.0000
Std. Dev.	0.2393	74.0018	36.3139	0.3233	0.0406	396.4645	1.3689	0.2618
Skewness	4.1020	3.0267	3.6547	3.1660	1.9294	2.6135	-0.2278	4.2676
Kurtosis	36.0816	15.3209	17.8782	16.6485	6.6234	11.5595	3.4706	21.6706
Jarque-Bera	3872.334	628.1568	915.9557	754.587	93.3988	335.2898	1.4298	1404.7990
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4892	0.0000
Sum	2.4658	1777.134	998.618	55.4269	2.1617	21920.19	1420.173	7.5725
Sum Sq. Dev.	4.5237	432625.2	104177.1	8.2568	0.1302	12417544	148.0414	5.4135
Observations	80	80	80	80	80	80	80	80

Source: Author's computation, 2021.

In table 1, the descriptive statistics such as mean, median, skewness and minimum value, and the distribution of the sample measured by the skewness, kurtosis and the Jaque-Bera statistics were analyzed. The Jarque-Bera of the variables showed that all the variables reject the null hypothesis of normal distribution except for size. The standard deviation estimates shows that debt to equity ratio (DER) is the most volatile, while equity ratio (EQR) is the least volatile variable. All variables are positively skewed except for SIZE.

The financial performance metric with the highest return is the return of equity with an average ROE 22.21. The results also showed the firm with very poor financial performance of has an ROE of -160.3675. Return on asset has the least spread between the minimum and maximum value of -0.7160 and 1.7507 respectively. The maximum size of the firm is 20.99 while the minimum is 14.62 with an average of 17.75. The maximum debt ratio (DR) and equity ratio 2.48 and 0.20 with a mean of 0.69 and 0.027.

Table 2. Correlation Matrix

	ROA	ROE	EPS	DR	EQR	DER	SIZE	LTD
ROA	1.00000							
ROE	0.22524	1.00000						

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EPS	0.19427	0.88566	1.00000					
DR	-0.35585	-0.13657	-0.19611	1.00000				
EQR	0.00538	-0.19192	-0.22685	0.26015	1.00000			
DER	0.03970	0.34470	0.42257	-0.12823	-0.42218	1.00000		
SIZE	0.00047	0.35785	0.46217	0.02977	-0.57291	0.73801	1.00000	
LTD	-0.42773	-0.04187	-0.0353	0.819561	0.445161	-0.08082	-0.01483	1.00000

Source: Author's computation, 2021.

The correlation test in table 2. above was conducted to examine the correlation amongst each variable. The result shows a value of 1.0000 within each variable which indicates perfect correlation. All variables have a low positive correlation with ROA. Size has the lowest except for DR and LTD which have negative correlation with ROA. DR, EQR and LTD all have a negative correlation with ROE while other variables have positive correlation. DR, EQR and LTD are negatively correlated to EPS.

Table 3. VIF and Multicollinearity

Variable	**VIF**	**1/VIF**
Long Term Debt	4.00	0.249790
Debt Ratio	3.38	0.295812
Size	3.03	0.329578
Debt to Equity Ratio	2.36	0.423896
Equity Ratio	2.17	0.460845
Mean VIF	2.99	

Source: Author's computation, 2021.

The variance Inflation Factor (VIF) is used to measure the presence of multicollinearity amongst the independent variables. The result shows that there is no problem of multicollinearity as none of the values are above 10.0.

Table 4. Average Leverage Ratios and Financial Performance Metrics of Selected Oil and Gas Firms in Nigeria

	Percentage of Leverage	**Leverage**	**ROA**	**ROE**	**EPS**
ARDOVA	71%	0.7052	-0.0099	3.9834	0.7850
BOC	41%	0.4081	0.0711	1.1735	0.5810

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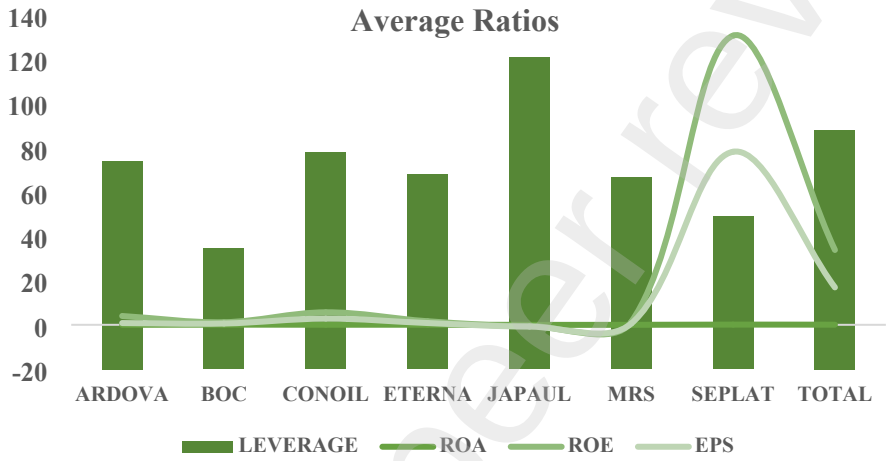
CONOIL	73%	0.7349	0.0293	5.6570	2.8110
ETERNA	66%	0.6606	0.0380	1.6166	0.7990
JAPAUL	106%	1.0569	-0.0248	-0.5629	-0.8055
MRS	65%	0.6494	-0.0031	1.3410	0.5790
SEPLAT	52%	0.5174	0.0899	130.6874	78.2033
TOTAL	81%	0.8103	0.0562	33.8173	16.9090

Source: Author's computation, 2021.

Figure 1. Percentage of Average Ratio.



Source: Author's computation, 2021.

Extent of financial leverage of quoted oil and gas firms in Nigeria.

Table 4 presents the average leverage ratios and financial performance metrics (ROA, ROE, EPS) for selected oil and gas firms in Nigeria. Japaul Plc has the highest leverage ratio at 106%, indicating it relies heavily on debt financing. In contrast, BOC Gases has the lowest leverage ratio at 41%, suggesting a more conservative approach to debt.

BOC and SEPLAT, with the lowest leverage ratios, exhibit strong financial performance, indicated by positive ROA, ROE, and EPS. Japaul, with the highest leverage, shows negative financial performance metrics (negative ROA, ROE, and EPS), indicating financial distress. Total, despite a high leverage ratio (81%), achieves high ROE and EPS, suggesting effective utilization of debt.

The data suggest a general inverse relationship between leverage and financial performance. Firms with lower leverage tend to perform better financially, except in the case of Total, which manages high leverage efficiently. ROE appears to be the most

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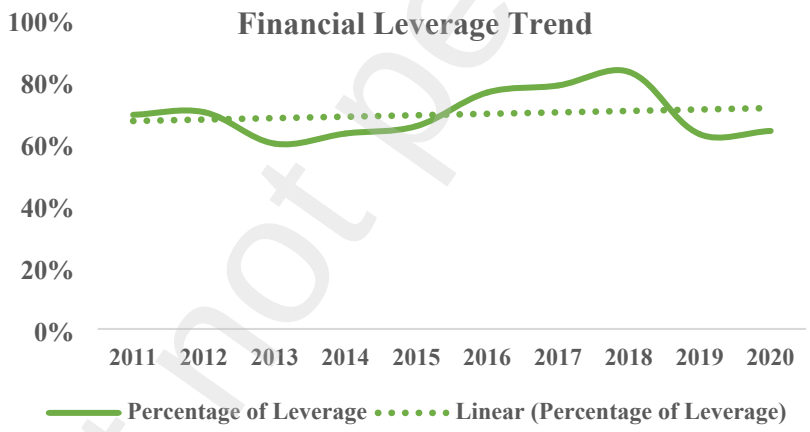
sensitive to changes in leverage, making it a critical metric for assessing the impact of capital structure on financial performance.

Table 5. Percentage of Leverage by Year

Year	Percentage of Leverage
2011	69%
2012	70%
2013	60%
2014	63%
2015	66%
2016	76%
2017	79%
2018	83%
2019	63%
2020	64%

Source: Author's computation, 2021.

Figure 2. Percentage of Average Leverage.



Source: Author's computation, 2021.

Financial Leverage Trend

Figure 2 shows the trend line of the average leverage ratio of selected oil and gas firms in Nigeria from 2011 to 2020. The sector has experienced a generally stable trendline with some fluctuations. The oil and gas sector had the highest leverage of 83% in 2018. However, there was a significant drop in leverage from 83% in 2018 to 63% in 2019. This

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substantial decrease could be attributed to the economic slowdown caused by the Covid-19 pandemic.

Table 6. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Model 1: ROA Cross-section random	6.840587	5	0.2328
Model 2: ROE Cross-section random	30.946791	5	0.0000
Model 3: EPS Cross-section random	73.316448	5	0.0000

Source: Author's computation, 2021.

The Hausman test was carried out to determine whether a fixed effects model or a random effects model should be applied to the panel data analysis. A result of the Hausman test with a p-value higher than 0.05 indicates that the random effects model is appropriate, whereas a result with a p-value lower than 0.05 indicates that the fixed effects model is appropriate. The results presented in Table 6 show that the random effects model was appropriate for Model 1, which used ROA as the financial performance metric. Conversely, the fixed effects model was applicable to Models 2 and 3, which used ROE and EPS as the financial performance metrics, respectively.

Table 7. Regression Summary Report

Variable	**ROA** **Coefficient (Prob.)**	**ROE** **Coefficient (Prob.)**	**EPS** **Coefficient (Prob.)**
Constant (C)	-0.698006 (0.1932)	-434.4749 (0.3063)	-505.1522 (0.002)
Debt Ratio (DR)	0.066914 (0.624)	80.00864 (0.2369)	19.86947 (0.4282)
Equity Ratio (EQR)	2.443351 (0.0062)	-31.32348 (0.9582)	265.5772 (0.2342)
Debt to Equity Ratio (DER)	6.623406 (0.9432)	-0.153017 (0.0016)	-0.103664 (0.0000)
Long-Term Debt (LTD)	-0.623683 (0.001)	-119.2124 (0.1727)	-31.85218 (0.3256)
Size of the Firm (SIZE)	0.037948 (0.216)	25.64836 (0.2719)	29.74914 (0.001)

Source: Author's computation, 2021.

Table 8. Model Statistics

Statistic	**ROA**	**ROE**	**EPS**

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R-squared	0.262425	0.438193	0.677439
Adjusted R-squared	0.212589	0.337571	0.619667
F-statistic	5.265768	4.354832	11.72607
Prob(F-statistic)	0.000343	0.000043	0.000000
Durbin-Watson stat	1.998575	2.462417	2.206812

Source: Author's computation, 2021.

Return on Assets (ROA)

The regression analysis for Return on Assets (ROA) highlights several key findings. The constant term has a value of -0.698006 with a p-value of 0.1932, indicating it is not statistically significant. The Debt Ratio (DR) shows a coefficient of 0.066914 and a p-value of 0.624, suggesting no significant relationship with ROA. Conversely, the Equity Ratio (EQR) has a significant positive relationship with ROA, as evidenced by its coefficient of 2.443351 and a p-value of 0.0062. This indicates that an increase in EQR by 1 unit is associated with an increase in ROA by approximately 2.44 units. Long-Term Debt (LTD) has a significant negative impact on ROA, with a coefficient of -0.623683 and a p-value of 0.001, implying that an increase in LTD by 1 unit is associated with a decrease in ROA by about 0.62 units. The Debt-to-Equity Ratio (DER) and the Size of the Firm (SIZE) do not show significant relationships with ROA, with coefficients of 6.623406 (p-value of 0.9432) and 0.037948 (p-value of 0.216), respectively.

The R-squared value is 0.262425, indicating that approximately 26.24% of the variability in ROA can be explained by the independent variables. The Adjusted R-squared value is 0.212589, suggesting that about 21.26% of the variability in ROA is explained when adjusting for the number of predictors. The F-statistic is 5.265768 with a p-value of 0.000343, indicating the model is statistically significant and the independent variables collectively impact ROA. The Durbin-Watson statistic is 1.998575, which is close to 2, suggesting no significant autocorrelation in the residuals.

Return on Equity (ROE)

The analysis for Return on Equity (ROE) reveals the constant term is -434.4749 with a p-value of 0.3063, indicating it is not statistically significant. The Debt Ratio (DR) has a coefficient of 80.00864 and a p-value of 0.2369, showing no significant relationship with ROE. Similarly, the Equity Ratio (EQR) does not significantly affect ROE, with a coefficient of -31.32348 and a p-value of 0.9582. However, the Debt-to-Equity Ratio (DER) shows a significant negative relationship with ROE, with a coefficient of -

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0.153017 and a p-value of 0.0016, indicating that an increase in DER by 1 unit is associated with a decrease in ROE by approximately 0.15 units. Long-Term Debt (LTD) and the Size of the Firm (SIZE) do not significantly affect ROE, with coefficients of -119.2124 (p-value of 0.1727) and 25.64836 (p-value of 0.2719), respectively.

The R-squared value is 0.438193, indicating that approximately 43.82% of the variability in ROE can be explained by the independent variables. The Adjusted R-squared value is 0.337571, suggesting about 33.76% of the variability in ROE is explained when adjusting for the number of predictors. The F-statistic is 4.354832 with a p-value of 0.000043, indicating the model is statistically significant and the independent variables collectively impact ROE. The Durbin-Watson statistic is 2.462417, slightly above 2, suggesting some positive autocorrelation in the residuals.

Earnings Per Share (EPS)

The regression analysis for Earnings Per Share (EPS) shows the constant term is -505.1522 with a p-value of 0.002, indicating it is statistically significant. The Debt Ratio (DR) has a coefficient of 19.86947 with a p-value of 0.4282, showing no significant relationship with EPS. The Equity Ratio (EQR) also does not significantly impact EPS, with a coefficient of 265.5772 and a p-value of 0.2342. The Debt-to-Equity Ratio (DER) shows a significant negative relationship with EPS, with a coefficient of -0.103664 and a p-value of 0.0000, indicating that an increase in DER by 1 unit is associated with a decrease in EPS by approximately 0.10 units. Long-Term Debt (LTD) does not significantly affect EPS, with a coefficient of -31.85218 and a p-value of 0.3256. However, the Size of the Firm (SIZE) has a significant positive relationship with EPS, with a coefficient of 29.74914 and a p-value of 0.001, suggesting that an increase in SIZE by 1 unit is associated with an increase in EPS by approximately 29.75 units.

The R-squared value is 0.677439, indicating that approximately 67.74% of the variability in EPS can be explained by the independent variables. The Adjusted R-squared value is 0.619667, suggesting about 61.97% of the variability in EPS is explained when adjusting for the number of predictors. The F-statistic is 11.72607 with a p-value of less than 0.00001, indicating the model is highly statistically significant and the independent variables collectively impact EPS. The Durbin-Watson statistic is 2.206812, slightly above 2, suggesting some positive autocorrelation in the residuals.

5. Conclusion

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The result of the analysis on the extent and trend of financial leverage among Nigerian oil and gas firms indicates that lower leverage ratios are generally associated with better financial performance. However, efficient management of high leverage can also lead to strong financial outcomes, as revealed by Total. The relationship between capital structure and financial performance highlights the importance of strategic debt management in the sector.

The regression result for capital structure on return on assets shows that debt ratio and debt-to-equity ratio have a positive insignificant effect on ROA revealing that the sample firms with higher debt will have no impact on ROA which is supported by the irrelevant theory of Modigliani and Miller (1958) [15]. It also shows that equity ratio has a positive significant impact on ROA. It also revealed that long term debt has a negative and significant effect on ROA. This finding aligns with the irrelevance theory posited by Modigliani and Miller (1958) [15], which suggests that, under certain conditions, the financing mix between debt and equity does not affect a firm's overall value.

The regression result for capital structure on return on equity shows that debt to equity ratio has a negative significant relationship with ROE, long term debt has negative insignificant effect on ROE and equity ratio has a positive insignificant impact on ROE. According to the pecking order theory, firms prefer internal financing to avoid the costs of asymmetric information associated with external financing. The negative relationship between DER and ROE indicates that firms may be over-relying on debt, resulting in adverse effects on equity returns.

The regression results for capital structure on earnings per share (EPS) show that the debt-to-equity ratio (DER) has a negative significant effect on EPS, indicating that an increase in DER results in a decrease in EPS. Long-term debt (LTD) has a negative but insignificant effect on EPS, while the debt ratio (DR) and equity ratio (EQR) have a positive but insignificant impact on EPS.

The finding that DER has a negative significant effect on EPS and that LTD has a negative but insignificant effect on EPS suggests that agency costs are at play. High leverage can lead to conflicts between debt holders and equity holders, as managers might undertake riskier projects that benefit shareholders at the expense of debt holders. This supports the agency cost theory, which posits that higher leverage can reduce performance due to

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agency issues. However, it also shows that efficient debt management, as indicated by Total's performance, can mitigate these costs.

The combination of capital structure that affects ROA, has a different effect on ROE and a most significant effect on EPS supporting literature that capital structure does not directly affect total earnings as much as it affects shareholders equity- EPS

Recommendations

The results of this study have significant policy implications for firms in the Oil and Gas Industry.

Equity Ratio and Return on Assets: The study found that the equity ratio has a positive and significant effect on ROA. This suggests that to increase their return on assets, firms should prioritize increasing the equity portion in their capital structure rather than relying on long-term debt, which was found to have a negative and significant relationship with ROA.

Debt-to-Equity Ratio and Return on Equity (ROE): To enhance return on equity, oil and gas firms should focus on reducing their debt-to-equity ratio. Additionally, minimizing the use of long-term debt in capital structure financing is advisable, as it contributes negatively to ROE.

Earnings Per Share (EPS)**: The findings indicate that to improve earnings per share, oil and gas firms must maintain a lower debt-to-equity ratio and minimize long-term debt. This balance helps optimize EPS performance.

In conclusion, to enhance overall financial performance, it is crucial for quoted oil and gas firms in Nigeria to have a higher proportion of equity in their capital structure compared to debt. This strategic focus on equity over debt will support better financial health and performance metrics across the industry.

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