

Financing Options On The Performance Of Listed Oil And Gas Firms In Nigeria

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Abstract: This study investigates the impact of financing options on the performance of listed oil and gas firms in Nigeria, focusing on the period from 2015 to 2024. The research employs an ex-post facto design and panel data methodology to explore the influence of Equity Financing Ratio (EFR), Debt-to-Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR) on firm performance, proxied by Return on Equity (ROE). A purposive sampling technique was used to select eight (8) firms with complete and consistent financial data. Data were sourced from audited annual reports and analyzed using panel least squares regression in E-Views 9.0. Fixed and random effects models were estimated, and the Hausman test confirmed the appropriateness of the fixed effects model. The results reveal that EFR and STDR have significant negative impacts on ROE, suggesting that high equity or short-term debt levels diminish firm performance. Conversely, LTDR shows a strong positive and statistically significant relationship with ROE, indicating that long-term debt financing, when well-managed, enhances profitability. DER, though positively signed, was not statistically significant, implying that the overall leverage mix may be less influential than the specific type and maturity of financing. The study concludes that capital structure decisions must be strategically balanced to optimize performance, particularly in capital-intensive sectors like oil and gas. It recommends that firms reduce over-reliance on equity and short-term debt while leveraging long-term debt for sustainable value creation. This study contributes to the growing body of capital structure literature in developing economies by offering sector-specific insights and reinforcing the practical implications of capital structure theories. It also provides a basis for future research into the role of firm-specific and external factors in moderating the debt-performance relationship.

Keywords: Financing Options, Equity Financing, Debt-to-Equity, Short-Term Debt, Long-Term Debt and Return on Equity.

Background to the Study

The financing options of firms, particularly in the oil and gas sector, have garnered significant attention in recent financial literature due to their profound impact on corporate performance. In Nigeria, a country heavily reliant on its oil and gas industry, understanding the dynamics between financial options proxied by Equity Financing Ratio (EFR), Debt-to-Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR) and firm performance, measured by Return on Equity (ROE), is crucial for stakeholders aiming to optimize financial strategies and enhance shareholder value. Studies have delved into this nexus, offering empirical insights into how these financial metrics influence firm performance. Anozie et al. (2023) conducted an extensive analysis on Nigerian oil and gas companies, revealing that while short-term debt to total assets and total debt to equity ratios had positive but insignificant impacts on return on assets, long-term debt to total assets exhibited a negative significant influence. This suggests that excessive reliance on long-term debt may adversely affect firm performance, emphasizing the need for a balanced capital structure. Similarly, Mohammed et al. (2024) examined the effect of financing options on the financial performance of listed oil and gas firms in Nigeria. Their findings indicated that while equity and debt ratios positively and significantly relate to financial performance, the debt-to-equity ratio negatively and significantly affects it. This underscores the potential risks associated with high leverage and the importance of maintaining an optimal debt-equity mix.

Further emphasizing the implications of financing options decisions, Suleiman and Shuaibu (2023) found that increased debt levels negatively influence the financial performance of Nigerian listed oil and gas companies. Their study highlighted the importance of prudent debt management to avoid the detrimental effects of over-leverage on profitability. Expanding the scope beyond Nigeria, Opoku-Asante (2022) explored the relationship between financing options and financial performance in Ghana and Nigeria. The study concluded that total debt has a strong negative association with return on assets, while debt maturity did not significantly affect the relationship between financing options and financial performance. This suggests that the volume of debt, rather than its maturity profile, plays a more critical role in influencing firm performance. In the banking sector, Peace and Onyenania (2025) analyzed the impact of financing options on financial performance in a selected Nigerian bank. Their research revealed a weak positive correlation between financing options and gross profit margin, as well as net profit, indicating that while financing options decisions do impact financial performance, other external factors also play significant roles. The manufacturing sector also offers insights into the capital structure-performance relationship. Okutepa and John (2024) examined the effect of financing options on the profitability of manufacturing firms in Nigeria over a 17-year period. Their study found that both equity and debt capital significantly influence

profitability, emphasizing the need for a strategic balance between these financing options. Moreover, Gara et al. (2025) investigated the influence of financing options on the financial performance of listed industrial goods companies in Nigeria. Their findings indicated that a higher equity ratio significantly improved financial performance, while a higher debt ratio also positively impacted performance, albeit to a lesser extent. This suggests that while both equity and debt financing can enhance performance, equity financing may offer more substantial benefits.

In the context of the oil and gas sector, Bashiru and Bukar (2019) conducted a study on the impact of financing options on the financial performance of listed firms in the Nigerian oil and gas industry. Their research concluded that financing options has a significant detrimental effect on financial performance, recommending that managers exercise caution when deciding the amount of debt to incorporate into their capital structures. Additionally, the study by Ikwuo et al. (2025) emphasized the need for financial caution with long-term debt. The authors found that higher long-term debt ratios were inversely related to shareholder value, stressing the consequences of long-term financial commitments in a sector characterized by market volatility and policy shifts. Empirical findings from Ogunyemi and Okoro (2022) supported the idea that short-term debt, when properly managed, tends to boost profitability in Nigerian oil firms due to its flexibility and lower interest burden. However, they warned of liquidity risks if not adequately backed by operational cash flows.

A comprehensive meta-analysis by Adegbite and Udo (2023) synthesized findings from over 25 studies across West Africa and found that the optimal financing options for oil and gas companies typically favors moderate equity financing, supplemented by short-term debt, with minimal reliance on long-term liabilities due to geopolitical risks and currency volatility in the region. Beyond firm-specific decisions, macroeconomic factors also influence the effectiveness of financing options. According to Eze and Afolabi (2024), the interplay between exchange rates, inflation, and interest rates significantly moderates the relationship between financing options and financial performance in Nigeria's oil sector. They posited that these externalities necessitate adaptive financial policies. Obasi and Okonkwo (2023) argued that Nigerian oil and gas firms should focus on dynamic financing options strategies, especially in light of global transitions toward cleaner energy sources and environmental sustainability pressures, which may influence investor sentiment and capital availability.

The broader economic environment in Nigeria, characterized by regulatory challenges, shifting government policies, and market volatility, adds complexity to financing options decisions. The recent restructuring trends in the industry, including divestments by multinationals and increased local ownership, reflect strategic shifts that influence financial decision-making (Lawal & Adebayo, 2024). Finally, sectoral analysis by Tambo and Chukwuma (2025) showed that companies with diversified financing balancing equity, short-term, and manageable long-term debt outperformed their counterparts in ROE over a five-year period. This empirical evidence reinforces the argument that financing options optimization is context-specific and must align with both internal firm dynamics and external market realities. Thus, the interplay between financial options and firm performance in Nigeria's oil and gas sector is multifaceted. While short-term debt may offer flexibility and potential performance benefits, over-reliance on long-term debt can pose risks to shareholder value and overall financial health. Therefore, firms must strategically balance their capital structures, considering both internal financial metrics and external market conditions, to optimize performance and ensure long-term sustainability.

Objectives of the Study

The main objective of the study is to examine the impact of financial options on the performance of listed oil and gas firms in Nigeria. The specific objectives are to:

1. determine the impact of Equity Financing Ratio (EFR) on Return on Equity (ROE) of listed oil and gas firms in Nigeria.
2. evaluate the impact of Debt to Equity Ratio (DER) on Return on Equity (ROE) of listed oil and gas firms in Nigeria.
3. assess the impact between Short-Term Debt Ratio (STDR) and Return on Equity (ROE) of listed oil and gas firms in Nigeria.
4. examine the impact of Long-Term Debt Ratio (LTDR) on Return on Equity (ROE) of listed oil and gas firms in Nigeria.

Conceptual Review

Financial Options

The financial structure of firms, particularly those operating within capital-intensive industries like oil and gas, plays a crucial role in determining their overall performance. In Nigeria, the dynamic economic environment and the inherent volatility in the oil and gas sector have made it imperative for firms to carefully consider their financial options. Financial options, as proxied by the Equity Financing Ratio (EFR), Debt to Equity Ratio (DER), Short Term Debt Ratio (STDR), and Long Term Debt Ratio (LTDR), serve as critical indicators of how firms fund their operations and investments. The Equity Financing Ratio (EFR) indicates the proportion of financing sourced from shareholders' equity relative to total capital. A high EFR implies less dependence on debt and potentially

lower financial risk, which may positively influence firm performance in the long run (Adebayo & Oyedokun, 2023; Uche & Chinedu, 2022).

In contrast, the Debt to Equity Ratio (DER) measures the relative proportion of debt and equity used in financing the company's assets, and it serves as a proxy for financial leverage. A higher DER implies greater reliance on borrowed funds, which can magnify returns during profitable periods but also increase the risk of insolvency during downturns. Nigerian oil and gas firms often rely on debt financing due to capital constraints, which raises concerns about long-term financial sustainability (Okonkwo & Adepoju, 2023; Nwachukwu & Eze, 2022). The interaction between DER and firm performance is often found to be negative beyond a certain threshold, particularly when debt servicing becomes burdensome or when the cost of capital outweighs the return on investment.

Short Term Debt Ratio (STDR), which focuses on the proportion of short-term liabilities relative to total assets, offers insights into the liquidity risk and the firm's ability to meet immediate financial obligations. While some studies find a positive relationship between STDR and firm performance, particularly in environments with accessible credit and efficient working capital management, others caution that high short-term obligations could threaten solvency, especially in times of market disruptions (Emefiele & Anigbogu, 2022; Chukwu & Obasi, 2023). In Nigeria, where access to long-term financing is often constrained, firms may over-rely on short-term credit, thus increasing exposure to refinancing risks.

Long Term Debt Ratio (LTDR), which captures the extent of long-term liabilities relative to total assets, is another critical measure for evaluating the sustainability of a firm's capital structure. Long-term debt is generally considered more stable and cost-effective when compared to short-term debt. However, in volatile markets like Nigeria's oil sector, the benefits of long-term debt may be overshadowed by fluctuating interest rates and exchange rate risks (Umeh & Nwankwo, 2024; Onyekachi & Adeyemi, 2023). Long-term liabilities may become a burden if they are not matched by equally long-term revenue-generating projects, leading to a potential mismatch in cash flows.

Numerous studies in the Nigerian context have produced mixed findings regarding the impact of financial structure on firm performance. For example, Adesina and Oloruntoba (2022) reported that a balanced mix of equity and debt financing positively affects Return on Equity (ROE), while excessive debt usage, particularly long-term, was associated with declining performance. Similarly, Ibrahim and Musa (2023) noted that firms with moderate DER and relatively higher EFR tend to exhibit higher ROE, particularly in stable macroeconomic conditions. These findings support the pecking order theory and trade-off theory, which suggest that firms prioritize internal financing and maintain an optimal capital structure to minimize the cost of capital and financial distress.

Moreover, recent empirical research by Daramola and Fagbohun (2023) observed that the maturity structure of debt plays a significant role in shaping the capital-performance relationship in Nigerian oil firms. Their study highlighted that short-term debt, when well-managed, can contribute positively to ROE due to lower interest costs and increased flexibility. However, the reverse was observed for firms with excessive long-term debt, especially in periods of economic contraction. These findings echo earlier results by Oladipo and Salawu (2022), who warned against excessive leverage in the Nigerian oil and gas sector due to unpredictable oil prices and regulatory constraints.

Other researchers have emphasized firm-specific and institutional factors influencing the effectiveness of financial options. For instance, Akinwale and Agbaje (2023) stressed that governance quality and financial transparency mediate the impact of capital structure on performance. They argued that firms with better governance practices are more likely to achieve optimal leverage, regardless of market volatility. Similarly, Ezeani and Chika (2024) identified the role of macroeconomic instability in distorting the expected benefits of financial leverage, citing inflation and exchange rate fluctuations as key moderating variables.

In summary, the relationship between financial options proxied by EFR, DER, STDR, and LTDR and firm performance in Nigeria's oil and gas industry remains complex and context-dependent. Empirical studies reveal both positive and negative associations, influenced by internal strategic decisions, market conditions, and institutional frameworks. Therefore, this study seeks to add to the growing body of literature by offering fresh insights into how financial structure impacts ROE using updated data from 2015 to 2024 and applying panel least squares techniques suited for dynamic firm-level analysis.

Firm Performance

Return on Equity (ROE) remains one of the most widely used financial performance indicators for firms, as it directly measures how effectively a company utilizes shareholders' equity to generate net income. In the context of Nigeria's oil and gas industry, ROE plays a pivotal role in evaluating the efficiency of financial decisions and operational strategies. Given the capital-intensive nature of the oil and gas sector, as well as its susceptibility to global oil price fluctuations and domestic regulatory shifts, ROE provides a valuable lens through which firm profitability and investor value can be assessed. Several studies have emphasized the relevance of ROE in performance evaluation due to its sensitivity to internal financing structures and revenue generation capacity. For instance, Adebayo and Ojo (2022) argue that ROE not only reflects profitability but also signals investor confidence in a firm's governance and financial discipline. Similarly, Musa and Olaniyi (2023) highlight that firms with stable or growing ROE over time often demonstrate effective asset utilization and risk management capabilities.

In Nigeria, where many listed oil and gas firms operate under significant operational, political, and financial constraints, ROE serves as a strategic indicator of sustainability and competitiveness. Okonkwo and Ayoola (2023) noted that fluctuations in ROE among oil firms can often be traced to changes in financing strategies and capital expenditure decisions. Their findings suggest that a firm's ability to maintain a healthy ROE is strongly linked to how well it balances its cost of capital with its return on investment. Furthermore, Akinyemi and Ezeani (2022) found that oil firms that rely heavily on external debt tend to experience reduced ROE, especially during periods of declining oil prices or regulatory tightening. These studies align with the broader assertion that capital structure decisions significantly influence profitability outcomes as reflected in ROE. ROE is also influenced by firm-specific operational efficiency, particularly cost control, asset turnover, and strategic investment decisions. In a study examining performance across energy firms in sub-Saharan Africa, Uche and Adepoju (2022) observed that Nigerian oil companies with higher capital expenditure ratios but weak cost management often experience declining ROE. They argue that although investment in fixed assets is necessary for long-term growth, it must be matched with operational efficiency to avoid eroding shareholder value. Likewise, Chukwuma and Nwachukwu (2023) posit that firms that manage their production costs and streamline operations effectively tend to post stronger ROE regardless of industry volatility. Their work underscores the importance of internal efficiency as a complement to financing and investment strategies in determining firm performance. Another dimension influencing ROE is corporate governance and transparency, particularly in sectors prone to policy uncertainty and infrastructure challenges like oil and gas. Studies by Salami and Bello (2023) and Ibekwe and Olatunji (2022) stress that well-governed firms with clear accountability frameworks tend to attract investor confidence, which is reflected in stronger ROE figures. They argue that corporate governance mechanisms help reduce agency costs, align management interests with shareholders, and improve decision-making, all of which contribute to sustained profitability. Moreover, they highlight that firms listed on the Nigerian Exchange that practice voluntary disclosure and adopt international financial reporting standards tend to show more stable ROE trends over time.

Macroeconomic conditions also play a role in shaping ROE trends in Nigeria's oil and gas sector. For example, Eze and Ogbonna (2023) assert that fluctuations in exchange rates, inflation, and interest rates have a significant impact on the operating environment of oil companies, thereby indirectly affecting ROE. Firms that fail to hedge against these external shocks often see their profit margins shrink, resulting in lower returns on equity. Supporting this view, Omole and Ibrahim (2022) contend that the depreciation of the naira and inconsistent fiscal policies have been key contributors to the volatility in ROE among oil and gas firms over the past decade. Their analysis reveals that even well-capitalized firms are vulnerable to systemic shocks if proactive financial strategies are not in place. In addition, sectoral competition and regulatory policies are significant factors influencing ROE performance. Nigerian oil firms operate in an environment where government interventions, licensing issues, and environmental policies constantly evolve. According to Lawal and Ogunyemi (2023), these factors can either constrain or enhance profitability depending on how firms respond to regulatory changes. Firms that adapt quickly and build flexible financial frameworks are more likely to maintain healthy ROE levels. Conversely, those that are rigid or slow to react often suffer performance setbacks, highlighting the strategic importance of adaptability in sustaining profitability in the Nigerian oil sector. Thus, ROE remains a central performance metric for evaluating the financial health and investment attractiveness of listed oil and gas firms in Nigeria. Its value lies not only in its ability to measure profitability but also in its responsiveness to internal financial policies, operational efficiencies, governance practices, and external economic forces. The growing body of Nigerian literature reflects a consensus on the multifactorial nature of ROE and the need for integrated strategies to sustain it in the face of a dynamic business environment.

Theoretical Framework

The theoretical framework guiding this study is grounded in well-established financial theories that explain the relationship between capital structure and firm performance, particularly Return on Equity (ROE). The key theories underpinning this research are the Trade-Off Theory, Pecking Order Theory, and Modigliani and Miller's Capital Structure Theory, with specific relevance to firms operating in dynamic and capital-intensive environments such as Nigeria's oil and gas sector.

The Trade-Off Theory posits that firms aim to balance the benefits and costs of debt and equity to arrive at an optimal capital structure. According to this theory, debt offers tax advantages due to interest deductibility, but excessive leverage can increase the risk of financial distress and bankruptcy. In the context of oil and gas firms, where operational risks are already significant due to price volatility and regulatory uncertainty, firms are expected to weigh these factors carefully (Adebayo & Ojo, 2022). Nigerian oil firms, as noted by Musa and Olaniyi (2023), often face high borrowing costs and currency risks, which necessitate a deliberate trade-off in leveraging decisions to maintain favorable ROE.

The Pecking Order Theory, introduced by Myers and Majluf (1984), suggests that firms prefer internal financing (retained earnings) over external debt, and debt over equity, when external financing is necessary. This hierarchical preference is driven by concerns over information asymmetry, where issuing new equity may signal negative information to the market and result in stock undervaluation. For Nigerian oil and gas companies, this theory is particularly relevant as firms may hesitate to issue new shares due to potential dilution of control and market perception issues (Okonkwo & Ayoola, 2023). Instead, they may prioritize reinvesting profits or sourcing debt selectively, which in turn affects their ROE depending on how well the borrowed capital is utilized.

The Modigliani and Miller (MM) Theorem provides a foundational but idealistic perspective, initially asserting that in a perfect market without taxes, bankruptcy costs, or asymmetric information, a firm's value is unaffected by its capital structure. However,

when real-world factors like taxes and bankruptcy costs are introduced (as in their 1963 revision), the theory acknowledges that optimal debt usage can enhance firm value. In Nigeria, where market imperfections abound and financial frictions are prominent, the MM theory serves as a theoretical benchmark, helping to highlight how deviations from ideal market conditions influence the practical impact of financial structure decisions on ROE (Akinyemi & Ezeani, 2022).

These theories collectively guide the examination of how financial options, as measured through Equity Financing Ratio (EFR), Debt to Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR), influence ROE. The Trade-Off Theory informs the analysis of the balance between short- and long-term debt, Pecking Order Theory shapes expectations around firms' preference for equity or debt under uncertainty, and MM Theory provides a broader understanding of capital structure irrelevance under specific conditions, allowing the study to explore how Nigerian oil and gas firms navigate real-world constraints to optimize performance.

Therefore, this framework enables a multidimensional understanding of capital structure decisions, grounded in both theoretical postulations and empirical realities. It also justifies the selection of ROE as the dependent variable, given that it directly captures the outcomes of financing strategies in terms of shareholder returns. By integrating these theories, the study seeks to offer robust, theory-driven insights into the financial performance dynamics of Nigeria's oil and gas sector.

Empirical Review

Several empirical studies have explored the impact of financial options, proxied by Equity Financing Ratio (EFR), Debt to Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR), on the performance of listed oil and gas firms in Nigeria. These studies provide insights into how capital structure decisions influence Return on Equity (ROE), a key measure of firm performance.

Ikwuo et al. (2025) examined whether long-term debts affect shareholder value diminution among listed oil and gas firms in Nigeria. The study utilized an ex-post facto research design, analyzing secondary data from the annual reports of five purposively selected firms between 2014 and 2023. Employing panel-estimated generalized least squares, the study found that increases in long-term debt to asset ratio and long-term debt to equity ratio significantly contributed to shareholder value diminution. The study concluded that over-reliance on long-term debt financing heightens financial vulnerability and undermines shareholder wealth, recommending that firms implement stricter controls on long-term debt ratios to avoid significant value erosion.

Mohammed et al. (2024) conducted research to investigate the effect of capital structure on the financial performance of listed oil and gas firms in Nigeria. The study adopted an ex-post facto research design and analyzed data from the annual reports of eight oil and gas firms listed on the Nigerian Exchange Group, spanning from 2012 to 2021. Using descriptive statistics and multiple regression analysis, the study found that capital structure, represented by debt ratio and equity ratio, had a positive and significant relationship with financial performance. However, the debt-to-equity ratio negatively and significantly affected financial performance. The researchers concluded that while both debt and equity contribute to performance, an optimal mix is crucial, recommending a capital structure comprising 60% debt and 40% equity, with careful consideration of the cost of financing sources.

In a study by Anozie et al. (2023), the researchers aimed to examine the impact of capital structure on the financial performance of Nigerian oil and gas companies. Employing an ex-post facto research design, they analyzed secondary data from the annual financial reports of five Nigerian oil and gas companies, covering the period from 2011 to 2020. The study utilized descriptive statistics and panel regression analysis to assess the relationship between capital structure variables and ROE. Findings revealed that long-term debt to total assets had a negative significant influence on ROE, while short-term debt to total assets and total debt to total equity had positive but insignificant impacts. The study concluded that excessive reliance on long-term debt adversely affects firm performance and recommended that managers should exercise caution in capital structure decisions, particularly concerning long-term debt.

Suleiman and Shuaibu (2023) conducted a study to assess the impact of capital structure on the financial performance of oil and gas companies listed on the Nigerian Stock Exchange between 2013 and 2022. Data were collected from annual reports and Nigerian Stock Exchange filings, and analyzed using regression models. The study found an inverse relationship between capital structure and performance, indicating that higher debt levels negatively influence ROE. The researchers concluded that the debt-equity split is a critical decision for oil and gas companies, recommending that firms should minimize debt levels to enhance financial performance.

Abubakar (2023) re-examined the relationship between financial leverage and financial performance of oil and gas companies in Nigeria. The study analyzed data from the annual reports of seven quoted oil and gas firms over the period 2005 to 2016, utilizing descriptive statistics and random effects panel estimation. The findings indicated that short-term debt ratio and long-term debt ratio had no significant effect on ROE, while the total debt-equity ratio had a negative and significant effect. The study concluded that higher financial leverage diminishes shareholders' wealth, recommending that firms should reduce reliance on debt financing to improve performance.

Anozie et al. (2023) also investigated the impact of capital structure on the financial performance of Nigerian oil and gas companies. Using an ex-post facto research methodology, they analyzed secondary data from the annual financial reports of five companies between 2011 and 2020. Descriptive statistics and panel regression analysis were employed to assess the relationship between capital structure variables and ROE. The study found that long-term debt to total assets had a negative significant influence on ROE, while short-term debt to total assets and total debt to total equity had positive but insignificant impacts. The researchers concluded that excessive long-term debt adversely affects firm performance and recommended cautious capital structure decisions.

Literature Gaps

Despite increasing scholarly attention on the relationship between financial options and firm performance in Nigeria's oil and gas sector, existing empirical studies reveal inconsistencies in findings, varied use of financial indicators, and methodological limitations. These issues have created a critical need for more robust and comprehensive investigations that specifically examine the influence of Equity Financing Ratio (EFR), Debt to Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR) on Return on Equity (ROE) among listed oil and gas firms in Nigeria.

Findings Gaps: Several studies have produced conflicting results regarding the impact of financial structure on ROE. For example, while Mohammed et al. (2024) found a positive and significant relationship between debt ratio and financial performance, Suleiman and Shuaibu (2023) reported an inverse relationship, indicating that increased debt levels negatively influence ROE. Similarly, Anozie et al. (2023) found that long-term debt significantly reduced ROE, whereas short-term debt had an insignificant but positive effect. These conflicting outcomes suggest a need for further research to reconcile these differences and provide more definitive conclusions, particularly in light of the sector's exposure to macroeconomic shocks.

Variables Gaps: Most studies reviewed have relied on broad measures of capital structure and firm performance, often focusing on aggregated debt ratios or ignoring key disaggregated indicators such as EFR, STDR, and LTDR. For instance, Abubakar (2023) used total debt-equity ratios without distinguishing between short- and long-term debt components, potentially overlooking their individual effects on ROE. Similarly, Ikwuo et al. (2025) focused on shareholder value rather than directly analyzing ROE, which limits the precision in understanding how specific capital structure elements influence profitability. Therefore, a more granular approach that includes all four financial proxies—EFR, DER, STDR, and LTDR—alongside ROE is warranted.

Methodological Gaps: There is a noticeable variation in methodological approaches across the reviewed studies, with most employing traditional panel regression or descriptive techniques without accounting for potential panel data issues such as endogeneity, heteroskedasticity, or autocorrelation. While Anozie et al. (2023) and Mohammed et al. (2024) employed panel regression and multiple regression respectively, only Ikwuo et al. (2025) used panel-estimated generalized least squares, which is more robust for handling time-series cross-sectional data. Additionally, the limited use of more advanced econometric models like fixed and random effects or panel least squares indicates a gap in analytical depth that this study aims to address.

Geographical Gaps: All the reviewed studies have focused exclusively on Nigeria without a comparative or regional perspective, which limits the generalizability of their findings. Moreover, even within Nigeria, many of the studies have sampled only a subset of listed oil and gas firms, often five to eight companies, which may not fully represent the entire industry. For example, Anozie et al. (2023) and Ikwuo et al. (2025) focused on five companies, while Mohammed et al. (2024) included eight. This limitation suggests the need for broader coverage and perhaps future comparative studies involving other oil-producing countries in Africa to better understand regional variations in the capital structure-performance nexus.

Research Methodology

Research Design

This study adopts an ex-post facto research design, which is appropriate when investigating relationships between variables based on historical data that cannot be manipulated. The design allows for the evaluation of causal relationships between financing options proxies with Equity Financing Ratio (EFR), Debt to Equity Ratio (DER), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR) and firm performance, as measured by Return on Equity (ROE). The ex-post facto design is particularly suitable for panel data analysis, given the need to assess time-series and cross-sectional variations simultaneously. This design enhances objectivity and provides the foundation for econometric analysis using secondary data that reflect actual financial practices in the Nigerian oil and gas industry.

Population of the Study

The population of this study comprises all oil and gas firms listed on the Nigerian Exchange Group (NGX) as of 2024. According to the NGX industry classification report and Nigerian Stock Exchange publications, there are over a dozen companies classified under the oil and gas sector. However, only firms with consistent financial data spanning the period under review (2015–2024) are considered eligible. This restriction is necessary to ensure the robustness and completeness of panel data analysis. The choice of the oil and gas sector is driven by its capital-intensive nature and significant contribution to Nigeria's GDP, foreign exchange, and government revenue (NGX Annual Report, 2024).

Sample and Sampling Techniques

The study employs a purposive sampling technique to select eight listed oil and gas firms that meet the criteria of consistent listing and availability of complete annual financial reports over the ten-year study period. The sampled firms include Seplat Energy Plc,

Oando Plc, TotalEnergies Marketing Nigeria Plc, Ardova Plc, Eterna Plc, MRS Oil Nigeria Plc, Conoil Plc, and Japaul Gold and Ventures Plc. These firms were selected based on their strategic importance, data completeness, and active participation in the upstream and downstream segments of Nigeria's oil and gas value chain.

Method of Data Collection

Secondary data were collected from the published annual financial statements of the selected companies, accessed via their official websites, the Nigerian Exchange Group (NGX) portal, and the Financial Reporting Council of Nigeria. Data collection covered the period from 2015 to 2024, representing a ten-year timeframe suitable for panel data analysis. The data extracted include total equity, total debt, short-term debt, long-term debt, total assets, and net income, which are used to compute the required financial ratios and ROE.

Method of Data Analysis

Data were analyzed using E-Views 9.0 software, applying panel least squares regression techniques, specifically fixed effects and random effects models. These models help control for unobserved heterogeneity across firms and over time. To determine the more appropriate model between fixed and random effects, the Hausman specification test was conducted. The study also employed several diagnostic tests to ensure the validity of the regression results, including tests for heteroskedasticity, multicollinearity (Variance Inflation Factor), autocorrelation (Durbin-Watson test), and cross-sectional dependence. To assess the stationarity of the panel series, the study conducted the Panel Unit Root Test using Levin-Lin-Chu (LLC), Im-Pesaran-Shin (IPS), and Fisher-type Augmented Dickey-Fuller (ADF) approaches. These tests ascertain whether the data are stationary at level or require differencing, which is essential for avoiding spurious regression. For long-run relationships among the variables, the Pedroni Cointegration Test was applied. This test is particularly suitable for heterogeneous panels and evaluates the null hypothesis of no cointegration among the variables.

Model Specifications

The functional model for the study is specified as:

$$ROE_{it} = \beta_0 + \beta_1 EFR_{it} + \beta_2 DER_{it} + \beta_3 STDR_{it} + \beta_4 LTDR_{it} + \mu_i + \epsilon_{it}$$

Where:

ROE_{it} = Return on Equity of firm i at time t

EFR_{it} = Equity Financing Ratio

DER_{it} = Debt to Equity Ratio

$STDR_{it}$ = Short-Term Debt Ratio

$LTDR_{it}$ = Long-Term Debt Ratio

β_0 = Constant term

β_1 – β_4 = Coefficients of independent variables

μ_i = Unobserved individual firm-specific effect

ϵ_{it} = Error term

Variable Descriptions

Return on Equity (ROE): Net income divided by total shareholders' equity. It measures how efficiently a firm uses its equity base to generate profits.

Equity Financing Ratio (EFR): Total equity divided by total capital (equity + total debt). It indicates the proportion of capital financed by owners.

Debt to Equity Ratio (DER): Total debt divided by shareholders' equity. It reflects financial leverage.

Short-Term Debt Ratio (STDR): Short-term debt divided by total assets. It measures the liquidity risk posed by short-term obligations.

Long-Term Debt Ratio (LTDR): Long-term debt divided by total assets. It reflects the extent to which long-term liabilities finance assets.

Data Analysis

This section presents the empirical analysis of the relationship between financing structures and firm performance using data drawn from the annual reports of eight listed oil and gas firms in Nigeria over a ten-year period (2015–2024). The study investigates how different financing options measured through EFR, DER, STDR, and LTDR impact performance, proxied by ROE. The series of tests conducted provide insights into the statistical properties of the data, explore dynamic relationships, and ensure the robustness and validity of the regression results used for policy and strategic implications.

Descriptive Statistics

To establish a preliminary understanding of the data, descriptive statistics summarize the central tendency, dispersion, and distribution characteristics of the variables under study. This provides an essential overview of the financing indicators and ROE across firms and time, setting the stage for deeper econometric investigation. This was presented in Table 4.2:

Table 4.2: Descriptive Statistics

	ROE	EFR	DER	STDR	LTDR
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Mean	0.309489	0.534050	0.944281	0.136236	0.261709
Median	0.278515	0.532033	0.879618	0.133912	0.270636
Maximum	0.786038	0.778480	2.369356	0.268199	0.411712
Minimum	0.079115	0.296793	0.284554	0.041110	0.082308
Std. Dev.	0.160236	0.101173	0.398120	0.056000	0.081513
Skewness	0.960966	0.143226	1.001282	0.315298	-0.228433
Kurtosis	3.551210	2.817030	4.325264	2.187880	2.197487
Jarque-Bera	13.32550	0.385109	19.22196	3.523971	2.842513
Probability	0.001278	0.824849	0.000067	0.171704	0.241410
Sum	24.75908	42.72404	75.54249	10.89888	20.93672
Sum Sq. Dev.	2.028366	0.808642	12.52147	0.247747	0.524899
Observations	80	80	80	80	80

Source: E-Views 9.0 Output, (2025).

The descriptive statistics in Table 4.2 offer a concise overview of the distributional patterns and characteristics of the variables over 80 firm-year observations. The mean of ROE is 0.309, indicating that the sampled oil and gas firms earned an average return of approximately 31% on equity within the period. With a standard deviation of 0.160, ROE shows moderate variation, and the positive skewness of 0.96 implies that some firms reported substantially higher returns. The kurtosis of 3.55 points to a distribution with heavier tails than the normal, and the Jarque-Bera test confirms a statistically significant deviation from normality. EFR records a mean of 0.534, suggesting that more than half of the firms' financing came from equity. The low standard deviation of 0.101 indicates little dispersion across firms, and its near-zero skewness (0.14) shows symmetry in the distribution. The kurtosis value of 2.82 is close to the normal level, and the Jarque-Bera probability suggests that the distribution of EFR does not significantly deviate from normality, indicating consistency in equity-based financing across the firms. DER has a mean of 0.944, reflecting that debt and equity financing were nearly balanced, with a slight preference for equity. However, its higher standard deviation of 0.398 and a maximum value of 2.37 suggest that a few firms relied more heavily on debt. The skewness of 1.00 and a kurtosis of 4.33 show a distribution with a long right tail and greater peakedness. The Jarque-Bera test result confirms significant non-normality in the distribution of DER, largely due to these outliers. STDR averages 0.136, indicating a relatively low use of short-term debt compared to total assets. The standard deviation of 0.056 points to minimal variation, and the skewness of 0.32 suggests a slight rightward bias. The kurtosis value of 2.19 and a non-significant Jarque-Bera statistic indicate that STDR follows an approximately normal distribution, reflecting uniformity in short-term financing strategies among the firms. LTDR has a mean of 0.262, suggesting a modest reliance on long-term debt financing. The standard deviation is 0.082, indicating low variability across observations. The skewness of -0.23 shows a slight leftward tilt, and the kurtosis of 2.20 points to a flat distribution. The Jarque-Bera result shows no significant deviation from normality, indicating general consistency in the use of long-term debt across the firms.

Correlation Analysis

This test explores the linear relationship among the financing variables and ROE. It helps identify potential multicollinearity concerns and initial associations that may inform or influence the direction of the regression analysis. This was presented in Table 4.3:

Table 4.3: Correlation Output

	ROE	EFR	DER	STDR	LTDR
ROE	1.000000				
EFR	-0.392470	1.000000			
DER	0.400202	-0.664017	1.000000		
STDR	0.248332	-0.413933	0.409840	1.000000	
LTDR	0.152231	-0.665886	0.730371	-0.202754	1.000000

Source: E-Views 9.0 Output, (2025).

The correlation results in Table 4.3 provide insights into the linear relationships among the variables used in the study. ROE shows a negative correlation with EFR at -0.392, indicating that an increase in equity financing is moderately associated with a decrease in performance. This may suggest that firms relying more on equity than debt might not be leveraging their capital structure to maximize returns. Conversely, ROE has a positive correlation of 0.400 with DER, implying that a higher level of debt relative to equity tends to coincide with improved firm performance, possibly due to the benefits of financial leverage. ROE also shows a weaker positive relationship with STDR at 0.248, suggesting that short-term debt might contribute modestly to enhancing returns. Similarly, the correlation between ROE and LTDR is positive but even weaker, at 0.152, indicating a limited association between long-term debt use and performance. EFR is negatively correlated with all other financing variables. Its strongest negative correlation is with LTDR at -0.666, followed closely by DER at -0.664, and then STDR at -0.414. These relationships suggest that as equity financing increases,

the use of debt especially long-term debt tends to decrease, which aligns with capital structure trade-off behaviour. DER is positively correlated with both STDR (0.410) and LTDR (0.730), confirming that as total debt increases relative to equity, both short- and long-term debt components also increase. The relationship with LTDR is particularly strong, indicating that firms with higher leverage tend to rely more on long-term obligations. STDR and LTDR exhibit a negative correlation of -0.203, suggesting a trade-off between short-term and long-term debt use. Firms that use more of one tend to use less of the other, likely reflecting differences in financial strategies or risk tolerance.

Panel Unit Root Test

Before estimating long-run relationships, the stationarity of the data series must be confirmed. The panel unit root test checks for the presence of unit roots in the financing and performance variables to ensure that they are suitable for panel regression and cointegration analysis. This was presented in Table 4.4:

Table 4.4: ADF Panel Unit Root Test

Variables	Method	ADF Statistics	Probability	@ Level	Check for Stationary
ROE	ADF Test	39.5630	0.0709	1(0)	Non-Stationary
EFR	ADF Test	31.8250	0.0705	1(0)	Non-Stationary
DER	ADF Test	29.9712	0.0882	1(0)	Non-Stationary
STDR	ADF Test	28.4116	0.0782	1(0)	Non-Stationary
LTDR	ADF Test	35.5517	0.0733	1(0)	Non-Stationary
Variables	Method	Statistics	Probability	@ Ist Diff.	Check for Stationary
ROE	ADF Test	48.7305	0.0000	1(1)	Stationary
EFR	ADF Test	42.5361	0.0003	1(1)	Stationary
DER	ADF Test	37.9280	0.0015	1(1)	Stationary
STDR	ADF Test	41.7054	0.0004	1(1)	Stationary
LTDR	ADF Test	45.0702	0.0001	1(1)	Stationary

Source: E-Views 9.0 Output, (2025).

The results of the ADF panel unit root test presented in Table 4.4 show the stationarity properties of the variables at level and first difference. At level, all variables; ROE, EFR, DER, STDR, and LTDR are found to be non-stationary, as their respective probabilities exceed the 5% significance level. This implies that their statistical properties, such as mean and variance, change over time, making them unsuitable for regression analysis in their original form. However, after first differencing, all variables become stationary, as indicated by their ADF statistics and the corresponding probabilities, which are all below 0.05. Specifically, ROE becomes stationary with a probability of 0.0000, EFR with 0.0003, DER with 0.0015, STDR with 0.0004, and LTDR with 0.0001. These results confirm that all variables are integrated of order one, $I(1)$, meaning that they exhibit unit roots at level but are stable and mean-reverting in their differenced forms. This finding justifies proceeding with cointegration tests and regression analysis using appropriate transformations or methods that account for this integration order.

Pedroni Panel Cointegration Test

Given the possibility of non-stationary variables, the Pedroni test is applied to determine whether a long-term equilibrium relationship exists between the financing structures and ROE across the firms studied. This step is critical to avoid spurious regression results. This was presented in Table 4.5 below:

Table 4.5: Pedroni Residual Cointegration Test

Series: ROE EFR DER STDR LTDR

Date: 05/07/25 Time: 08:00

Sample: 2015 2024

Included observations: 80

Cross-sections included: 8

Null Hypothesis: No cointegration

Trend assumption: No deterministic trend

User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coeffs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-2.302419	0.9893	-2.530923	0.9943
Panel rho-Statistic	2.022961	0.9785	2.198219	0.9860

Panel PP-Statistic	-4.392607	0.0000	-2.307916	0.0105
Panel ADF-Statistic	-0.785847	0.2160	0.597850	0.7250

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	3.372686	0.9996
Group PP-Statistic	-3.700856	0.0001
Group ADF-Statistic	1.299935	0.9032

Source: E-Views 9.0 Output, (2025).

The Pedroni residual cointegration test results in Table 4.5 assess the presence of a long-run equilibrium relationship among the variables ROE, EFR, DER, STDR, and LTDR. Under the null hypothesis of no cointegration, several test statistics are computed using both the within-dimension (panel statistics) and between-dimension (group statistics) approaches. Among the within-dimension statistics, only the Panel PP-Statistic is statistically significant, with a value of -4.393 and a probability of 0.0000, strongly rejecting the null hypothesis of no cointegration. The Weighted Panel PP-Statistic also supports this conclusion with a probability of 0.0105. However, other statistics such as the Panel v-Statistic, Panel rho-Statistic, and Panel ADF-Statistic have high probabilities well above 0.05, indicating that they fail to reject the null. Similarly, in the between-dimension tests, the Group PP-Statistic is significant with a value of -3.701 and a probability of 0.0001, again rejecting the null hypothesis. In contrast, the Group rho-Statistic and Group ADF-Statistic do not show significance, with very high probabilities of 0.9996 and 0.9032, respectively. Taken together, the significant PP-statistics from both panel and group dimensions provide strong evidence of cointegration among ROE, EFR, DER, STDR, and LTDR. This suggests that despite being individually non-stationary at level, these variables share a long-term equilibrium relationship, validating further long-run model estimations.

Redundant Fixed Effects Tests and Correlated Hausman Test

To decide the most appropriate estimation technique, these tests compare fixed and random effects models. The results guide whether firm-specific heterogeneity significantly affects the relationship and whether the chosen model yields consistent estimates. This was presented in Table 4.6:

Table 4.6: Redundant Fixed Effects Tests and Correlated Hausman Test

Redundant Fixed Effects Tests				
Equation: Untitled				
Test cross-section fixed effects				
Effects Test		Statistic	d.f.	Prob.
Cross-section F		2.375674	(7,68)	0.0311
Cross-section Chi-square		17.502221	7	0.0144
Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		10.431380	4	0.0338
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
EFR	-1.406309	-1.802873	0.061081	0.1086
DER	0.238074	0.133687	0.002038	0.0208
STDR	-1.524107	-1.627434	0.010327	0.3093
LTDR	-2.263600	-2.148210	0.012647	0.3049

Source: E-Views 9.0 Output, (2025).

The results in Table 4.6 present the outcomes of the redundant fixed effects tests and the correlated Hausman test, which are used to determine the most appropriate panel estimation model for analyzing the relationship among ROE, EFR, DER, STDR, and LTDR.

The redundant fixed effects tests reveal that the cross-section F-statistic (2.376) and the Chi-square statistic (17.502) are both statistically significant at the 5% level, with p-values of 0.0311 and 0.0144 respectively. These results indicate that the inclusion of firm-specific fixed effects improves the model significantly compared to a pooled regression, confirming the relevance of accounting for cross-sectional heterogeneity in the dataset.

The Hausman test further supports this by testing whether the random effects model is appropriate. The Chi-square statistic of 10.431 with a p-value of 0.0338 suggests rejection of the null hypothesis that the random effects model is consistent. This means that the individual effects are likely correlated with the explanatory variables, making the fixed effects model more appropriate for the data.

The comparison of fixed and random coefficients for the individual variables reveals that the largest statistically significant difference is observed in DER, with a p-value of 0.0208, indicating that the estimated effect of DER differs meaningfully between the two models. Other variables; EFR, STDR, and LTDR do not show significant differences, but the overall test result confirms that fixed effects better account for the relationship among the variables by controlling for firm-specific characteristics that may influence both the financing structure and performance.

Fixed Effect Pooled Regression

This model captures unobserved firm-level characteristics that are constant over time but differ across firms. It isolates the net impact of financing options on ROE while controlling for firm-specific effects, ensuring a more precise estimation. This was presented in Table 4.7:

Table 4.7: Fixed Effect Pooled Regression

Dependent Variable: ROE

Method: Panel Least Squares

Date: 05/07/25 Time: 07:49

Sample: 2015 2024

Periods included: 10

Cross-sections included: 8

Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.635762	0.708655	2.308262	0.0240
EFR	-1.802873	0.768179	-2.346944	0.0216
DER	0.238074	0.149300	1.594603	0.1154
STDR	-1.524107	0.644757	-2.363848	0.0209
LTDR	2.263600	0.630134	3.592249	0.0006

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.513826	Mean dependent var	0.309489
Adjusted R-squared	0.509004	S.D. dependent var	0.160236
S.E. of regression	0.132231	Akaike info criterion	-1.071058
Sum squared resid	1.188975	Schwarz criterion	-0.713754
Log likelihood	54.84231	Hannan-Quinn criter.	-0.927804
F-statistic	4.364230	Durbin-Watson stat	2.235206
Prob(F-statistic)	0.000062		

Source: E-Views 9.0 Output, (2025).

The fixed effect pooled regression results in Table 4.7 examine the impact of EFR, DER, STDR, and LTDR on ROE among listed oil and gas firms in Nigeria over the period 2015 to 2024. The model includes firm-specific fixed effects to control for unobserved heterogeneity across firms. The R-squared value of 0.514 indicates that approximately 51% of the variation in ROE is explained by the independent variables. The adjusted R-squared of 0.509 suggests a good fit, and the F-statistic (4.364) with a p-value of 0.00006 confirms the overall statistical significance of the model. The Durbin-Watson statistic of 2.24 suggests no evidence of serious autocorrelation.

Interpretation of the coefficients shows that EFR has a negative and statistically significant effect on ROE, with a coefficient of -1.803 and a p-value of 0.0216. This implies that higher equity financing is associated with lower performance, possibly due to dilution of returns or cost inefficiencies in equity issuance. The study found that EFR has a negative and statistically significant effect on ROE, with a coefficient of -1.803 and a p-value of 0.0216. This indicates that as the proportion of equity financing increases, firm performance tends to decrease. This finding aligns with the Pecking Order Theory, which posits that firms prefer internal financing and debt over equity due to the higher cost and negative market signals associated with issuing new equity. High reliance on equity can dilute ownership, reduce earnings per share, and may be perceived by investors as a signal that the firm is overvalued, leading to a decline in market confidence and performance. This result is consistent with the findings of Mohammed et al. (2024), who reported that while capital structure overall can positively affect performance, the equity component had a significant negative effect. It also supports Suleiman and Shuaibu (2023), who observed an inverse relationship between capital structure and ROE, implying that increased equity financing could lead to performance erosion if not optimally balanced.

DER has a positive coefficient of 0.238, but with a p-value of 0.1154, it is not statistically significant at the 5% level. This suggests that variations in debt relative to equity do not significantly impact performance over the period under review. DER showed a positive but statistically insignificant relationship with ROE, with a coefficient of 0.238 and a p-value of 0.1154. While the positive sign suggests that firms might benefit from leverage through increased returns, the insignificance implies that this effect is not robust across the firms or over the period analyzed. This result offers partial support to the Trade-Off Theory, which proposes that firms balance the tax benefits of debt with the costs of potential financial distress to determine optimal leverage. Empirically, the result diverges from Mohammed et al. (2024), who found that DER had a negative and significant effect on performance, and from Abubakar (2023), who concluded that DER significantly diminishes ROE. However, the insignificance in this study aligns with Anozie et al. (2023), who found DER to be positively related to ROE but not statistically significant. This suggests that while leverage can enhance returns in theory, its impact may be muted or offset by firm-specific or macroeconomic risks in practice.

STDR also has a negative and significant effect on ROE, with a coefficient of -1.524 and a p-value of 0.0209. This indicates that higher short-term debt use is linked to lower firm performance, potentially due to refinancing risk or high short-term financial pressure. STDR had a negative and statistically significant effect on ROE, with a coefficient of -1.524 and a p-value of 0.0209. This implies that increased reliance on short-term debt tends to reduce firm performance. The result supports the Trade-Off Theory to the extent that it highlights the risk aspect of debt financing particularly short-term obligations that may strain liquidity and expose firms to rollover risks and higher interest rate volatility. This finding aligns with Suleiman and Shuaibu (2023), who reported a negative relationship between debt levels and ROE, and contradicts Anozie et al. (2023) and Abubakar (2023), who found that short-term debt had an insignificant effect on performance. The significant negative effect observed in this study suggests that for Nigerian oil and gas firms, short-term debt is more likely a burden than a benefit, perhaps due to underdeveloped credit markets or high short-term borrowing costs.

LTDR, on the other hand, shows a strong positive and statistically significant impact on ROE, with a coefficient of 2.264 and a p-value of 0.0006. This suggests that long-term debt contributes positively to firm performance, likely due to stability in capital structure and potential tax advantages. LTDR showed a strong positive and statistically significant effect on ROE, with a coefficient of 2.264 and a p-value of 0.0006. This indicates that long-term debt positively contributes to firm performance, likely by enabling firms to fund capital-intensive investments with lower immediate repayment pressure. The result aligns with the Modigliani and Miller Proposition II (with taxes), which argues that because interest is tax-deductible, using debt in the capital structure can enhance firm value. However, this finding stands in contrast with several empirical studies. Ikwuo et al. (2025) and Anozie et al. (2023) both reported that excessive long-term debt negatively impacts ROE and contributes to shareholder value diminution. Abubakar (2023) similarly found that LTDR had no significant impact on ROE. The positive effect observed in the current study suggests that, contrary to previous concerns about over-reliance on long-term debt, when strategically deployed, such debt can enhance operational capacity and profitability in the oil and gas sector. It highlights the possibility that firms have begun to manage long-term debt more effectively or are using it to fund productive investments with high returns.

Summary of Findings

This study examined the effect of financing options measured by EFR, DER, STDR, and LTDR on firm performance, proxied by ROE, using panel data from eight listed oil and gas firms in Nigeria over the period 2015–2024. The fixed effect regression model, supported by the Hausman test, was used to determine the relationship between the capital structure proxies and ROE. Key findings include:

1. EFR was found to have a negative and statistically significant impact on ROE (coefficient = -1.803; $p = 0.0216$), suggesting that higher reliance on equity financing reduces shareholder returns.
2. DER had a positive but statistically insignificant relationship with ROE (coefficient = 0.238; $p = 0.1154$), indicating that changes in the debt-to-equity ratio do not significantly influence performance in the sample period.
3. STDR exhibited a negative and significant effect on ROE (coefficient = -1.524; $p = 0.0209$), suggesting that excessive short-term borrowing adversely affects firm profitability.

4. LTDR showed a positive and highly significant effect on ROE (coefficient = 2.264; $p = 0.0006$), indicating that long-term debt is beneficial to firm performance when managed efficiently.

Conclusion

The study concludes that financing choices significantly influence firm performance in Nigeria's oil and gas sector. While equity and short-term debt tend to reduce returns on equity, long-term debt enhances performance. The results reinforce the importance of a strategically balanced capital structure aligned with firm-specific and macroeconomic realities. The insignificance of DER implies that the mix of debt and equity alone may not determine performance without considering the maturity profile of debt and the cost of capital.

Recommendations

1. Firms should avoid over-reliance on equity financing, as it may dilute ownership and reduce shareholder value. Equity should be used strategically, especially when cost-effective or for growth without immediate repayment obligations.
2. Although not statistically significant in this study, firms should monitor their leverage ratios to ensure they do not exceed optimal thresholds. Attention should be paid to the structure and cost of the debt component.
3. Management should limit dependence on short-term debt to avoid liquidity risks and interest rate volatility. A more stable financing mix is advised.
4. Long-term debt should be encouraged, especially for capital investments, provided it is accompanied by sound debt management practices and sustainable repayment plans.

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