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Capital Structure and Value Creation in Listed Oil and Gas Companies in Nigeria

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ABSTRACT: Value creation (VC) increases shareholder value and maintains a competitive advantage; however, most companies tend to miss their mark in creating consistent value due to suboptimal capital structure (CS) choices. The primary objective of this study is to assess the nexus between CS and VC among listed oil and gas (O&G) companies in Nigeria. CS is represented by the debt-equity ratio (DER), the equity-to-total assets ratio (ETAR), and the total debt-to-total assets ratio (TDTA). VC is proxied by return on equity (ROE) and Tobin's Q (TOQ). The data employed in the study were secondary data sourced from audited financial statements of the eight listed O&G firms in Nigeria between 2014 and 2023. The panel data regression analysis was guided by the Hausman test. The results of the findings showed that DER and ETAR have inverse and positive significant effects, respectively, on ROE. TDTA has an inconsequential adverse effect on ROE. DER has a significant adverse relationship with TOQ at the 10% level. ETAR and TDTA have direct and negative insignificant relationships with TOQ, respectively. The study affirmed that there exists a distinct nexus between CS and VC. Firms are encouraged to reinforce equity financing to create value.

Keywords: Capital Structure, Debt-Equity Ratio, Equity-To-Total Assets, Tobin's Q, Value Creation.

INTRODUCTION

The purpose of corporate financial management is to create value because it relates to the long-term viability and competitiveness of companies (Saputra & Kusuma, 2025). Szczepańska-Woszczyna & Muras (2023) opined that value creation is the centre of the entity's lasting power since it increases shareholder value and maintains its competitive advantage. However, in the Nigerian oil and gas (O&G) industry, most of the listed firms tend to miss their mark in creating consistent value because of suboptimal capital structure choices (Bingilar & Kpolode, 2021; Christian & Oyewole, 2024). Anozie et al. (2023) and Onyemere (2024) believed that heavy financial leverage, poor equity position, and an increase in the cost of servicing the debts slow down profitability and firm valuation. These issues are further accompanied by energy transition

and loss of investor trust, which is a source of concern regarding long-term financial sustainability (Felix, 2024; Osho, 2025).

Onyemere (2024) described capital structure (CS) as the mix of debt and equity employed in financing a firm's operations, which is important in determining its financial performance and value. The oil and gas sector commonly uses debt financing to finance major projects, which include exploration and construction of infrastructure (Khaki & Akin, 2020; Onyemere, 2024). Although debt financing can attract ample capital, extreme leverage can expose the company to high amounts of financial risk in times when the economy experiences downturns or when the price of oil is dropping (Ezu, 2020). Equity financing, on the other hand, provides financial soundness and minimum liability to the debt but can dilute ownership and have an impact on the returns to the shareholders (Khan et al., 2024). This means that the optimal combination of these two aspects of debt and equity is crucial in maximizing the firm's value (Saputra & Kusuma, 2025).

Value creation in the O&G industry, where capital intensity and market volatility are the common features, is largely connected to the financial decisions of the entities, mainly the choice of CS. Anozie et al. (2023) observed that firms that have the capacity to form their mixture of debt and equity finance strategically contribute to their ability to give returns to shareholders and develop financial equilibrium. Nigerian-listed O&G firms face an unfavourable economic climate with low oil prices, regulatory risk, and macroeconomic limits, which require optimum CS choices to raise the worth of an entity (Tunde, 2021).

Financial barriers that O&G entities in developing economies have to contend with are restricted access to credit, unfriendly interest rates, economic fluctuations in the exchange rates, and infrastructural gaps (Osho, 2025). In spite of these issues, the segment continues to be a prime mover of the Nigerian economy, which pays substantial taxes to the government, earns foreign exchange through exports, and adds a lot to the gross domestic product (GDP) (Osho, 2025).

The fluctuating demands of oil trading in the world market and the reliance on external funding by the sector increase the financial risk, though they necessitate the optimisation of the capital structure to enable the continuous value generation (Osho, 2025). The Nigerian O&G market continues to be at the centre of the nation's economic growth and development, but it is bedevilled by financial and operational issues that impair the formation of value. Such factors as price volatility of oil, weak environmental laws and regulations, obsolete infrastructure, oil theft, and vandalization of the facilities require a strategic outlook on capital structure choices (Felix, 2024; Tunde, 2021).

The correlation between the CS and VC continues to be a central concern in financial management, particularly in the O&G sector of Nigeria. Although other research investigations, such as Bingilar & Kpolode (2021), Segun et al. (2021), have been devoted to the study of CS and VC, they primarily concentrate on profitability measures (ROA and ROE) and overlook such market-based measures of business success as TOQ. This gap highlights the need for a more comprehensive approach to measuring VC in the sector.

Also, the current evidence on the nexus between CS and VC is inconsistent, which shows a situation of a contextual gap. Indicatively, Chindengwike (2021) showed an inverse relationship between equity and ROE, whereas Câmara et al. (2022) observed a direct link between equity and ROE among electricity companies in Brazil. Such inconsistencies indicate that there are differences between sectors that affect financial leverage and performance, and this needs to be examined

further. Moreover, previous research has largely focused on the use of the debt-to-equity ratio (DER) but fails to consider vital indicators like the equity-to-total-assets ratio (ETAR) and the total-debt-to-assets ratio (TDTA), as they offer a better understanding of the financial structure (Singh & Singh, 2023; Udo et al., 2024).

Methodological gaps further limit the robustness of existing studies, as most have relied on static models, failing to capture long-term effects. To bridge these gaps, this study integrated multiple capital structure and value creation metrics while employing robust econometric techniques. This comprehensive approach ensured a more precise and sector-specific analysis of how CS influences VC in Nigerian O&G firms, addressing existing limitations in the literature.

The study sought to assess the nexus between CS and VC among listed O&G companies in Nigeria. Specifically, it sought to analyze how capital structure influences ROE and TOQ as measures of value creation. The motivation for this study lies in the need to offer empirical insights into how CS decisions affect VC in Nigeria's O&G sector. It aimed at providing a generalized evaluation of how companies can effectively optimize their capital component to raise their market valuation and maintain their financial sustainability by integrating the right indicators, like the ROE and the TOQ. It complements existing knowledge on CS in terms of maximizing corporate value. The findings will assist policymakers, corporate managers, and investors in ensuring informed decisions that will guarantee long-term growth and competitiveness within the sector.

Conceptual Review

Value Creation (VC)

Szczepańska-Woszczyna & Muras (2023) defined the value creation as the capacity of a company to achieve long-term economic value for its stakeholders through strategic financial decisions, operational effectiveness, and sustainable development. It is a decisive indicator of both financial fitness and competitive effectiveness of a firm, especially in capital-intensive industries, such as O&G. Companies create value through profitability, investment returns, and shareholder wealth maximization. TOQ and ROE are widely used as factors of value creation in financial performance analysis (Redjeki, 2022). The mechanism of effective management of CS has a dominant position in the value creation mechanism since it can impact the cost of capital and financial risk and the potential of returns (Christian & Oyewole, 2024). In the Nigerian O&G sector, firms must optimize CS to enhance financial stability, shareholder returns, and long-term sustainability amidst fluctuating market conditions and regulatory challenges (Osho, 2025).

Return on Equity (ROE)

(Satyanarayana & Rao, 2023) described ROE as a VC ratio that quantifies the capability of a firm to produce earnings on the investments of shareholders and is a division of the net income by shareholders' equity. When the ROE is high, it signifies that the entity is efficient in using its capital, which means that the company has good management and that it can grow on a sustainable basis (Nguyen & Nguyen, 2020). However, high debt financing can distort ROE, leading to unstable returns during economic downturns (Gupta & Chandra, 2024). Nigerian oil and gas firms must

balance equity and debt to maintain a stable ROE that supports financial sustainability and competitiveness in the global market (Nguyen & Nguyen, 2020).

Tobin's Q (TOQ)

TOQ is a financial ratio that compares the market value of an entity to the replacement cost of the assets, and can be used to show how effectively those assets generate market value (Christian & Oyewole, 2024). When the TOQ ratio is more than one, it is possible to say that the market value of the firm is more than the cost of its assets, which reveals a high growth potential and the confidence of investors (Mysaka & Derun, 2021). On the other hand, the ratio that is below one indicates undervaluation or inefficiencies in operations (Christian & Oyewole, 2024). Strategic capital structure choices that optimize leverage and investment returns can boost TOQ, reinforcing long-term VC and market competitiveness (Mysaka & Derun, 2021).

Capital Structure (CS)

Capital structure is a mix of debt and equity of the firm that is utilized to finance its operations and growth (Abate & Kaur, 2023). CS plays a vital role in value creation for listed O&G companies in Nigeria, particularly through DER, ETAR, and TDTA. A high ETAR would mean the greater dependence of a firm on equity financing, which would boost financial stability as well as lower the risk of bankruptcy, though it may restrict the potential gains to the shareholders (Myers, 2001). On the other hand, an increasing level of TDTA indicates more reliance on long-term debt that can be used to execute capital-intensive programmes but increases financial liabilities and interest rates (Abate & Kaur, 2023).

These financing decisions directly influence value creation metrics, such as ROE and TOQ, both of which reflect value creation (Redjeki, 2022). An optimal CS enhances ROE by efficiently utilizing financial resources to maximize shareholder value, while a balanced mix of debt and equity contributes to a higher TOQ, indicating strong investor confidence and market positioning (Muhammed et al., 2024). Given the volatility of Nigeria's O&G sector, achieving an appropriate CS is crucial for ensuring VC, leading to long-term financial sustainability and competitive advantage.

Debt-to-Equity Ratio (DER)

(Myers, 2001) opined that the DER is a financial leverage measure in a firm that relates the proportion of debt to the shareholders' equity. It shows the extent to which an entity is using its borrowed capital to fund its business and investments. A high DER suggests greater financial risk, as excess debt upsurges interest commitments and vulnerability to market fluctuations (Myers, 2001). Nonetheless, Muhammed et al. (2024) believed that modest use of debt might bring better VC with reference to the availability of funds to sustain the growth and expansion. The O&G business in Nigeria is a large industry, and long-term projects in the industry necessitate significant investment to generate proficiency in the industry and balance the profitability aspect with financial stability. In the Nigerian O&G sector, where large-scale projects require substantial funding,

achieving an optimal DER is essential for balancing profitability with financial stability (Osho, 2025).

Equity-to-Total Assets Ratio (ETAR)

The ETAR assesses a firm's reliance on equity financing in relation to total assets, showing its financial independence and risk management approach (Gara et al., 2025). Nguyen & Nguyen (2020) confirmed that the greater the ETAR, the lower the financial leverage, with decreased exposure to interest rate instability, improving stability and fortification of the business against downfalls in economic conditions. However, excessive reliance on equity may limit growth potential due to higher capital costs and diluted returns for shareholders (Myers, 2001). Nigerian O&G companies have to balance ETAR to maintain investor confidence while securing adequate capital for long-term expansion and operational sustainability, and invariably increasing the capability to create value.

Total Debt-to-Total Assets Ratio (TDTA)

The TDTA illustrates the level at which an entity uses debt sources to fund its overall assets, and it is a gauge of the financial leverage of a firm (Khan et al., 2024). High TDTA means greater financial leverage, which would increase returns in good market conditions but also bring financial distress in adverse conditions (Umamaheswaran et al., 2024). In the O&G industry, where capital expenses are significant, maintaining an optimal TDTA is imperative for liquidity management and sustainable value creation (Abubakar, 2020). Strategic debt management is an important corporate practice that should be used by Nigerian O&G companies to balance between the financing of growth and risk, where value creation and long-term financial strength are the goals.

Theoretical Review

Trade-Off Theory

The trade-off theory, originated by Kraus and Litzenberger in 1973, posits that firms balance the advantages and costs of debt to find an optimal CS (Abate & Kaur, 2023). TOT of CS assumes that entities seek to attain a balance between the gains of utilizing debts, such as a tax shield, and the disadvantages of possible financial failure (Myers, 2001). Researchers claim that companies that spend high amounts of capital include O&G firms in Nigeria, which aggressively target moderate levels of leverage to maximize financial excellence and reduce risks (Abubakar, 2020). This theory highlights that an entity should balance its debt proportion and equity to increase firm value and long-term survival in highly fluctuating markets (Said, 2025). The theory can be applied in this study to predict how listed Nigerian O&G companies would balance the rewards of debt, like tax shield, against bankruptcy costs that could maximize their benefit categories when it comes to VC using their CS.

Pecking Order Theory (POT)

The POT, posited by Myers & Majluf (1984), implies that firms favour internal financing over external financing due to the problems of information asymmetry. This theory stipulates that an entity would use retained earnings first, followed by debt, and lastly, equity when available funds are not enough (Anozie et al., 2023). In the Nigerian O&G industry, where the cost of external financing is high due to interests and other regulatory impediments, firms depend heavily on their own retained earnings as a source of capital investment funds (Anozie et al., 2023; Gupta & Chandra, 2024). POT applies to the study by suggesting that O&G firms in Nigeria favour internal financing over debt and equity issuance due to asymmetric information, which influences their CS decisions and impacts value creation.

Theoretical Framework

The TOT offers a fundamental insight into how the Nigerian O&G firms evaluate the benefits of tax on debt against the bankruptcy costs it incurs in the financial structure choices that are made. This theory is most applicable because the O&G sector is capital-intensive, and a significant amount of capital is required to find oil and develop infrastructure. In complementing such a view is the POT, which describes how the preference ordering of sources of funds is predetermined, among other things, which necessarily makes these firms turn to internal sources of finance more than they would turn to external sources due to asymmetric information and market conditions. As a whole, these theories can give some insight into the way in which Nigerian O&G companies could handle the issue of financing in a setting that combines volatile oil prices and regulatory issues. The failure to undertake a comprehensive analysis of the CS choices that will have a positive influence on value creation in this vital industry would be a failure concerning the application of the two theories.

When these two theoretical approaches are combined, they develop a strong model in which capital structure decisions can be analyzed, because they touch upon various (but complementary) issues of financial management. TOT deals with the optimal levels of debt, POT with the hierarchy of sources of finance. A combination of these theories offers a multi-dimensional perspective through which the analysis of how listed O&G entities in Nigeria organize their capital to optimize the creation of value by avoiding the industry-specific and macroeconomic challenges.

Empirical Studies

Several studies have been carried out to assess the nexus between the CS and VC of different industries in different regions. The research on the O&G industry of Nigeria shows that the DER has a considerable influence on the ROE, and a less consistent effect on other value creation metrics (Alaba, 2021; Bingilar & Kpolode, 2021; Segun et al., 2021). The results of these studies imply that debt option has the ability to improve VC but that excessive leverage is injurious to a firm's VC, that is to say, they lend credence to both the TOT and POT. Similar results were observed in other emerging markets, where firms rely heavily on debt but struggle with its associated risks (Dodoo et al., 2023; Ghani et al., 2023). The consensus submits that entities must balance debt and equity to maximize value creation.

Studies by sectors also show that there are disparities in the effects of CS on VC. Short-term debt has a good relation to the firm's VC in the manufacturing segment, and the method of using TOQ has proven to be a better value creation factor (Ayange et al., 2021). Studies in the financial and energy industries demonstrate that leverage has mixed effects on the ROE that are controversial (Câmara et al., 2022; Ngoc et al., 2021). Evidence on logistics, cement, and industrial corporations reveals that the choice of CS has a major effect on the VC of businesses, and higher debts are likely to suppress value creation (Hutapea & Sulistyowati, 2024; Modiba, 2022). The outcomes support the necessity of the CS strategies applied in a particular industry to maximize value creation Sike et al. (2023).

The results of the comparative analysis on the developed markets, including the USA and UK, show that when a firm has relatively low levels of leverage, it is valuable to use debt financing, whereas when the level of leverage is high, the value creation is decreased (Asaolu, 2021; Bendjazia, 2023). The studies conducted on the pharmaceutical and biotechnology industry indicate that modest levels of gearing positively affect value creation, but significant levels of debt cause financial distress (Boshnak, 2023; Prasad et al., 2024). Similarly, the capital structure of fast-moving consumer goods (FMCG) and non-financial listed firms in India can be characterized as showing a negative relationship with value creation, requiring extensive, considerate financial planning (Bansal et al., 2022; Singh & Singh, 2023). These studies favour the attribution that the structure of the optimum capital is industry and economic environment-specific.

Advanced econometric and machine learning techniques have been applied to predict capital structure and its impact on value creation. Panel data studies incorporating the GMM and random effects models have revealed complex interactions between debt, equity, and value creation metrics (Kadhafi et al., 2024). Research also suggests that agency costs mediate CS effects, with higher levels of debt aiding financial inefficiencies in certain sectors (Hutapea & Sulistyowati, 2024). These outcomes emphasize the evolving methodologies in CS research.

This is because regional and contextual factors are critical in the decision on CS. In Africa, the importance of government ownership and subsidies is stressed as variables that influence value creation, with too much debt resulting in low value creation (Kambi & Kasoga, 2024; Nassim & Benraïss, 2024). Factors like energy consumption and inflation are key decisive factors and contributing factors in ASEAN economies, which can be considered as a dynamic TOT (Ghani et al., 2023). Meanwhile, research on banking and state-owned enterprises emphasizes the role of internal controls and retained earnings in sustaining value creation (Ikbal, 2023; Udo et al., 2024). In general, the capital structure choices should take into consideration industry-based, economic, and regulatory conditions to optimize the value of the firm.

METHOD

This study used a panel data regression model to find out the nexus between CS and VC in listed O&G companies in Nigeria. This combined the time-series and cross-sectional aspects that enable analysis of the long-term effects of CS choices on value creation at a deeper level. This solution allows the study to have overall firm-specific effects and also makes the results robust.

The population and sample size are the eight (8) listed O&G firms in Nigeria. The firms that are listed guarantee a generation of quality and comparable information that is needed for an empirical study.

Secondary data were sourced from the audited financial reports of the entities for a decade (2014 - 2023). The financial information contained in these reports gives a detailed account of the CS of an entity, along with important value creation measures in terms of ROE and TOQ. Also, industry reports and regulatory filings on relevant information were consulted to complement the data.

A pre-estimation diagnostic test, the Hausman test, was conducted to arrive at the right estimation method, determining whether to use the fixed effects model (FEM) or the random effects model (REM) of panel data regression. This warranted that unobserved heterogeneity among the firms was considered in the analysis and that the parameter estimates were efficient.

The model specification is consistent with the study's objectives, wherein the study investigated the contribution of deciding on CS based on proxies of DER, ETAR, and TDTA on VC in the form of ROE and TOQ. The implicit form of the model is as specified below:

$$\text{value creation } = f(capital\ structure)] \quad 3.1$$

Explicitly:

$$ROE = f(DER,\ ETAR, TDTA) \quad 3.2$$

$$TOQ = f(DER, ETAR, TDTA) \quad 3.3$$

Econometrically:

$$ROE_{it} = \beta_0 + \beta_1 DER_{it} + \beta_2 ETAR_{it} + \beta_3 TDTA_{it} + \mu_{it} \quad 3.4$$

$$TOQ_{it} = \beta_0 + \beta_1 DER_{it} + \beta_2 ETAR_{it} + \beta_3 TDTA_{it} + \mu_{it} \quad 3.5$$

Where;

ROE is return on equity.

TOQ is Tobin's Q.

DER is the debt-to-equity ratio.

ETAR is the equity-to-total-assets ratio.

TDTA is the total debt-to-total assets ratio.

β_0 is the intercept of the model.

$\beta_1, \beta_2, \beta_3$ are the coefficients of the independent variables to be estimated.

i are the oil and gas firms.

t- time period (2014 to 2023)

μ_{it} is the error term of the model.

Table 1. Summary of Statistics

Statistic	ROE	TBQ	DER	TDTA	ETAR
Mean	1.385	0.423	0.359	0.484	0.519
Median	1.293	0.414	0.373	0.500	0.518
Max.	3.167	0.850	0.622	0.800	0.733
Min.	0.200	0.100	0.189	0.237	0.250
Std. Dev. (Std)	0.776	0.161	0.100	0.117	0.102
Skewness	0.221	0.183	0.337	0.182	-0.034
Kurtosis	2.349	3.128	2.607	3.155	2.776
Jarque-Bera	1.545	0.376	1.521	0.390	0.137
Probability	0.462	0.829	0.468	0.823	0.934
Sum	83.104	25.362	21.551	29.067	31.145
Sum Sq. Dev.	35.492	1.527	0.585	0.803	0.612
Observations	60	60	60	60	60

Source: Authors' Computation using E-views 12 (2025)

Table 1 presents the descriptive statistics of the Nigerian O&G firms, showing heterogeneous capital structure and value creation. The ROE is 1.385 (Std. 0.776) with a light positive skewness (0.221) and kurtosis (2.349), which implies that there is moderate dispersion and a skewed to the right distribution. TBQ (0.423) is less than the asset replacement cost and is almost normally distributed (skewness = 0, kurtosis = 3). DER has a mean of 0.359 (Std. 0.100), and the leverage has been relatively constant, but the skew (0.337) indicates that some firms have higher levels of debt. The average of TDTA is 0.484, which reflects that 48.4% of capital is held by debt, and kurtosis is found to be acceptable (3.155). ETAR is 0.519 with equity financing being favoured but extremely symmetrically distributed (skewness -0.034). Jarque-Bera tests confirm normality ($p > 0.05$), justifying the use of linear regression for further analysis.

Pre-Estimation Test

Table 2. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Equation 3.4	6.782	3	0.078
Equation 3.5	10.431	3	0.015

Source: Authors' Computation using E-views 12 (2025)

As revealed in Table 2, the Hausman test (HT) indicates the right model to be used between the FEM and the REM in each of the specified equations. In Equation 3.4, the HT gave a chi-sq. stat. of 6.782 with $p = 0.078$, which exceeds the 5% level of significance, meaning that REM is better in estimating the factors of ROE in the current study.

In contrast, for Equation 3.5, the HT returned a chi-sq. stat. of 10.431 with a $p = 0.015 < 0.05$. This shows that the FEM would be suitable to estimate the effects of the CS on TOQ because the individual effects are likely to be correlated with the regressors. These findings guided the selection of the estimation method in each of the equations, as this ensured that the panel regression estimates are robust and consistent.

Panel Regression Analysis

Table 3. Result of Panel Analysis (Random Effect) for Equation 3.4 and (Fixed Effect) for Equation 3.5

Variables	ROE (Random Effects) for Equation 3.5			TOQ (Fixed Effects) for Equation 3.5		
	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
DER	-0.371	0.215	0.018	-0.207	0.123	0.096
ETAR	0.446	0.384	0.031	0.129	0.096	0.188
TDTA	-0.194	0.262	0.154	-0.113	0.103	0.276
C	0.943	0.297	0.002	1.084	0.332	0.002
R^2	0.412			0.485		
F-Stat. [p-value]		10.83 [0.031]		23.061 [0.008]		
Durbin Watson (DW)		2.027		1.957		

Source: Authors' Computation using E-views 12 (2025)

The results in Table 3 depict the random effects model estimate of Equation 3.4, and the fixed effects model for Equation 3.5, which determined the effect of the CS on ROE and TOQ of listed firms of the Nigerian O&G industry. In Equation 3.4, the DER has a significantly negative effect on ROE (coeff. = -0.371; p = 0.018. This indicates that a 1-unit rise in DER decreases ROE by 0.371%, which means that the amount of earnings that will be retained by shareholders would be reduced, and could increase financial risk exposure. On the contrary, ETAR positively and significantly influences ROE, where the coefficient was 0.446 (p = 0.031). This shows that the increase in ETAR by 1 unit denotes an increment of ROE by 0.446%, which represents greater financial advantages and advancement in the strength to improve returns on equity. The TDTA has an adverse, insignificant link with ROE (coeff. = -0.194, p = 0.154). This means that a possible decline in the returns on earnings that might come as the debt obligations amount against the additional debt amount employed is immaterial.

Having an R^2 of 0.412 and an adjusted R^2 of 0.381, the R^2 value of selected CS metrics explains the variation of ROE by a well approximated 41.2 percent. The joint significance of the model is ascertained by the F-statistic of 10.83 (p = 0.031< 0.05), whereas the DW stat. of 2.027 signifies no worry of autocorrelation in the residual.

At the 10% significance level, the DER in Equation 3.5 has an adverse and statistically significant influence on TBQ (coeff. = -0.207 with p = 0.096 < 0.10). This implies that a unit rise in DER has a negative effect of 0.207% change in TBQ, and therefore, the more dependent the firm is on debt as compared to equity, the low will be its market value. The 10% significance level also suggests that there are potential valuation penalties on financial leverage in the investor perception, but based on less convincing findings.

A direct but not significant effect exists between ETAR and TBQ (coeff. = 0.129, p = 0.188 > 0.05). This means an increased amount of equity in asset financing could be positively related to the firm value, but at an insignificant level. Likewise, an adverse and non-significant influence exists between TDTA and TBQ (coeff. = -0.113 and p = 0.276). This shows that a unit growth in TDTA results in an insignificant decline in TBQ by 0.113%.

The level of the model's explanatory power is good, with an R^2 equal to 0.485 and an adjusted R^2 equal to 0.418, showing that the variation of 48.5% in TOQ is explained by CS variables. The F-

statistic of 23.06 ($p < 0.01$) verifies that the model is jointly significant, indicating that the collection of regressors can be used to substantially explain the alterations in TBQ. With Durbin-Watson of 1.957 means that no significant serial correlation exists in the residuals.

Post Estimation Diagnostics

Table 4. Result of Breusch-Pagan LM Cross-Sectional Dependence Test

Equation	Test Statistic	Degrees of Freedom (d.f.)	Probability (p-value)
Equation 3.4	2.589	2	0.097
Equation 3.5	3.218	2	0.073

Source: Author's Computation using E-views 12 (2025)

Table 4 presents the Breusch-Pagan LM test employed to evaluate the cross-sectional dependence in residuals of panel regression models. In Equation 3.4, the LM test result is 2.589 and $p = 0.097$, which exceeds the significance level ($p = 0.05$). The null hypothesis of zero cross-sectional dependence is thus accepted, indicating that the residuals across the cross-sections are statistically independent.

Similarly, in Equation 3.5, the result of the LM test (3.218 with $p = 0.073 > 0.05$). This further affirms the conclusion of no greater cross-sectional dependence. The findings validate the suitability of the methods of panel regression used, as the independence of the residuals was observed in both specifications of the models.

Table 5: Result Robustness and Specification Diagnostic Tests

Test Type	Equation	F-Statistic	Probability	Conclusion
Heteroskedasticity	3.4	1.0872	0.3190	No heteroskedasticity
Serial Correlation		2.2124	0.0998	No serial correlation
Heteroskedasticity	3.5	1.4725	0.2291	No heteroskedasticity
Serial Correlation		1.6198	0.1237	No serial correlation

Source: Author's Computation using E-views 12 (2025)

The robustness checks in Table 5 reveal that classical econometric problems do not influence the underlying regression models of the 2 equations (3.4 and 3.5) that are used in this study. In Equation 3.4, the test of heteroscedasticity can be performed using the output of the F-statistic (1.0872 and $p = 0.3190$), which denotes an insignificant result that heteroscedasticity is present. Also, the assessment of serial correlation gives an F-stat of 2.2124 with a p-value of 0.0998, which also fails to reject the null hypothesis of the absence of autocorrelation.

In Equation 3.5, the heteroscedasticity diagnostic gives the F-stat (1.4725 and $p = 0.2291$), which shows there is no evidence of variance instability in the residuals. The serial correlation test also has an F-stat (1.6198 with a $p = 0.1237$), which denotes that the F-statistic falls outside the critical

region, so there is no autocorrelation. These are post-estimation diagnostics that confirm the satisfactory quality of both models, satisfying the assumptions to be made to interpret the regression outcomes of the study.

This study assessed whether CS affects the VC of listed O&G companies in Nigeria. Based on the results in Table 3, which depicts the effect of CS on ROE of the companies, the coefficient on the DER was adverse and significant at 5% level (β = -0.371, p = 0.018), showing that a one-unit rise in DER will cause the ROE to go down by 0.371%. This revelation is a strong indicator of the TOT, which posits that too much debt leads to high financial distress expenses that, at some point, overtake the gains of the tax shield, especially in more volatile industries, such as O&G.

This empirical result agrees with Alaba (2021), Bingilar & Kpolode (2021), and Segun et al. (2021), who stated that excessive leverage weakens the profitability in the O&G industry of Nigeria. However, this outcome is in contrast with studies in more stable environments or specific contexts, such as Asaolu (2021) and Bendjazia (2023), who observed that firms in developed markets like the USA and the UK initially benefit from debt financing before an optimal point. Furthermore, Bansal et al. (2022) and Singh & Singh (2023) discovered that there is a mixed relationship between the FMCG and the NSC in India, implying that debt can boost value creation depending on the context.

On the other hand, ETAR has a direct and significant effect on ROE (β = 0.446, p = 0.031). This implies that the percentage increase in ROE attributed to an increase in the value of ETAR is an estimate of 0.45% of the increase in ROE, and hence, the higher the equity capitalisation of an entity, the higher the returns on equity to shareholders. This outcome is logical because it goes with the POT since companies employing more equity (mostly through reserves) will not incur the costs of information asymmetry that come with external debt, and therefore, value will improve. It also supports the TOT, where a stronger equity base reduces financial distress risk. Hutapea & Sulistyowati (2024) emphasized that equity capitalization enhances value creation in capital-intensive industries.

Conversely, other studies indicate that equity financing may not be better in every situation. For example, equity has divergent consequences on VC in financial and energy industries (Câmara et al., 2022; Ngoc et al., 2021), which are indicative of its context-dependent nature. Also, Boshnak (2023) as well as Prasad et al. (2024) observed that moderate debt (not high equity) may sometimes maximise value creation in other businesses such as pharmaceuticals and biotechnology, undermining the benefits of high ETAR in general.

The TDTA that measures the degree of asset funding with total debt had an adverse effect on the ROE, though this finding is insignificant (β = -0.194, p = 0.154). This shows that a rise in debt financing of the oil firms suggests the potential decline in value creation of the firms, though this result was not significant. Such observation is consistent with the TOT that the effects of the TDTA will vary according to the relative margin of benefits (tax shields) and costs (bankruptcy), which in this case might not be so strong as to have a significant result in this sample.

Supporting this finding, Modiba (2022) and Ngoc et al. (2021) observed that the effect of TDTA on ROE can be contingent upon sectoral dynamics and the cost of capital, sometimes showing insignificant results. Conversely, studies such as Ayange et al. (2021) in manufacturing and Hutapea

& Sulistyowati (2024) in industrial firms found significant negative effects of leverage on ROE, suggesting the insignificance here may be sector-specific. Furthermore, Dodoo et al. (2023) and Ghani et al. (2023) observed that entities in other emerging markets struggle significantly with debt risks, implying a stronger negative effect than observed in this Nigerian O&G sample.

In Table 3, the regression using FEM estimated the influence of CS on TBQ. The result reveals that the DER is negatively connected to TBQ (β = -0.207, p = 0.096), with statistical significance at10% level. This shows that a rise in DER leads to a fall by 0.207% in TBQ, implying that investors may be averse to firms with excessive financial leverage, seeing them as riskier and less valuable. It also agrees with the TOT, where the perceived risk of financial distress outweighs tax benefits in the sight of investors. Supporting studies include Alaba (2021), Bingilar & Kpolode (2021), and Segun et al. (2021), who linked high leverage to reduced firm value in Nigeria's O&G sector. Similarly, Kambi & Kasoga (2024) and Nassim & Benraïss (2024) found that excessive debt reduces profitability and value in African contexts. However, this contrasts with research showing debt can signal confidence or discipline management, such as Asaolu (2021) and Bendjazia (2023), who noted moderate debt can enhance value in developed markets before an optimal point.

Conversely, the coefficient of the ETAR is positive (β = 0.129) but statistically not significant (p = 0.188). This indicates that while a strong equity base might be associated with improved value creation, the evidence does not conclusively support this relationship within the current model. This result agrees with the POT, where equity option is a last resort and might not send a strong, favourable signal to markets compared to internal funds. This agrees with Câmara et al. (2022) and Ngoc et al. (2021), who observed that equity-financed firms in financial and energy sectors show mixed effects on TOQ, suggesting that equity signals strength but is not the sole determinant of value. In contrast, studies such as Hutapea & Sulistyowati (2024) and Sike et al. (2023) emphasized that equity capitalization supports financial stability and long-term value creation, suggesting a significant positive relationship.

Furthermore, TDTA shows an adverse and statistically insignificant relationship with TBQ (β = -0.113, p = 0.276), implying that increased overall leverage reduces firm value insignificantly. This result supports TOT that the net effect of total debt on value is contingent on the specific balance of benefits and costs, which may not slope significantly negatively in this context. Supporting this finding, Modiba (2022) found that while capital structure decisions shape value creation, the effect of total debt specifically can be subdued. In addition, Hutapea & Sulistyowati (2024) found that excessive debt significantly reduces performance and value in industrial firms, suggesting the insignificance observed here might not hold universally. Research by Ghani et al. (2023) in ASEAN economies also showed that determinants like inflation significantly impact financing decisions and value, implying TDTA could have a stronger effect under different macroeconomic conditions.

CONCLUSION

This study assessed the effect of CS on VC in the listed Nigerian O&G companies. Findings from the random effects regression model showed that the DER has a significant adverse influence on ROE, suggesting that higher financial leverage diminishes shareholder returns and increases risk. In contrast, the ETAR has a significant positive effect on ROE, highlighting the benefits of a stronger equity base. TDTA has an insignificant adverse relationship with ROE.

The fixed effects regression model revealed that DER negatively and significantly affects TOQ at the 10% level, indicating potential investor concerns over high leverage. However, ETAR and TDTA both showed insignificant positive and negative effects on TOQ, respectively, suggesting limited market responsiveness to these ratios. These results imply that while financial leverage affects both internal returns and market perception, equity financing contributes more reliably to firm value creation. The study concludes that CS decisions significantly affect value creation in the listed O&G companies in Nigeria, and that achieving an optimal mix of debt and equity is vital for enhancing value creation and investor confidence in the sector.

The research provides fresh empirical information on the influence of elements of CS (DER, ETAR, TDTA) on VC metrics (ROE and TOQ) in the Nigerian O&G, which is an underexplored area in the literature.

The study offers a more micro-level insight into the determinants of what dimension of financing (debt or equity) matters most to value creation in volatile areas of industry, since it examined the outcomes of each such component of CS independently.

The outcomes support the TOT (which weighs tax benefits of debt against distress cost), as well as the POT (which prioritizes internal financing), furthering theoretical discussion of optimal CS in the emerging markets.

This study complements the existing literature on CS by contextualizing it within the institutional and economic dynamics of the Nigerian environment, where determining management practices with regard to financial decisions is influenced by oil price volatility, regulation issues, and the risk associated with the currency.

The study will be of great assistance to policymakers, corporate managers, and scholars, as it provides evidence-based information that can guide further academic research and form practical approaches to financial management in the O&G sector.

Oil and gas companies should maintain a DER below 0.5 to avoid distress, lower financial risk, and optimize value creation.

Companies are urged to enhance equity financing because it is associated with better performance and lower financial distress when equity ratios are high.

The amount of debt should also be reviewed regularly so that the company does not end up overleveraged at the expense of its profitability, image, and value creation.

Companies should improve transparency, governance, and communication to positively influence market valuation beyond capital structure indicators.

This study is limited to O&G firms, and by geographical location, it is purely based on the Nigerian economy. The metrics used are debt-equity, equity-to-total assets, and total debt to total assets ratios as measures of CS, while return on equity and Tobin's Q proxied for VC. The period of the study is ten years, from 2014 to 2023.

REFERENCES

Abate, M. T., & Kaur, R. (2023). The evolution of modern capital structure theory: A Review. *Evolution*, *31*(2), 958–974. https://doi.org/https://tinyurl.com/4t82a63e

Abubakar, A. (2020). Financial leverage and financial performance of oil and gas companies in Nigeria. *Open Journals of Management Science*, *1*(1), 28–44. https://doi.org/https://tinyurl.com/yfw7jp8y

Alaba, O. V. (2021). Growth strategy and performance of oil and gas companies in Nigeria. *Growth, 5(6). International Journal of Trend in Scientific Research and Development (IJTSRD*, *5*(6), 2456 – 6470. https://doi.org/https://tinyurl.com/43xcpm5h

Anozie, O. R., Muritala, T. A., Ininm, V. E., & Yisau, N. S. (2023). Impact of capital structure on financial performance of oil and gas firms in Nigeria. *Future Business Journal*, *9*(1), 11. https://doi.org/https://tinyurl.com/2p9hwvxd

Asaolu, A. A. (2021). Capital structure and firm performance: A comparative study of oil & gas and manufacturing sectors in the United States of America. *Business and Management Studies*, *7*(1), 29–44. https://doi.org/https://tinyurl.com/3w77mexw

Ayange, A., Emmanuel, N. C., Rosemary, I. H., Ndudi, U. C., & Samuel, U. E. (2021). Effect of capital structure on firms' performance in Nigeria. *Universal Journal of Accounting and Finance*, *9*(1), 15–23. https://doi.org/https://tinyurl.com/3epcueze

Bansal, A., Rai, T., & Sharma, P. (2022). Impact of capital structure on financial performance of Indian fast-moving consumer goods companies. *Advance and Innovative Research*, *376*. https://doi.org/https://tinyurl.com/yn45x3e7

Bendjazia, N. (2023). *Does the capital structure impact the company's performance: empirical research of the effect of financing decisions on a company's profitability? Evidence from the UK Pharmaceutical and biotechnology sector.*

Bingilar, P. F., & Kpolode, O. P. (2021). Capital structure and financial performance of oil and gas companies listed on the Nigerian Exchange Group. *International Journal of Business and Management Invention (IJBMI*, *10*(8), 42–54. https://doi.org/https://tinyurl.com/yrn6vfrz

Boshnak, H. (2023). The impact of capital structure on firm performance: evidence from Saudi-listed firms. *International Journal of Disclosure and Governance*, *20*(1), 15–26. https://doi.org/https://tinyurl.com/59rn3ucr

Câmara, R. M., Caby, J., & Salvador, P. I. C. A. (2022). The effects of capital structure on profitability in the Brazilian electricity sector. *International Journal of Governance and Financial Intermediation*, *1*(3), 203–218. https://doi.org/https://tinyurl.com/2rc7pkk9

Chindengwike, J. (2021). Effect of equity on financial performance among small business firms in East African countries. *IJIRMPS*, *9*(3), 1–7. https://doi.org/https://tinyurl.com/2kzdabax

Christian, I., & Oyewole, J. S. (2024). Capital structure and firm value of listed oil and gas firms in. *Nigeria*, *3*(1), 173–189. https://doi.org/https://tinyurl.com/59awr79y

Dodoo, R. N. A., Kumi, M., & Mangudhla, T. (2023). The effect of capital structure on firm performance: Empirical evidence from emerging economy. *EuroMed Journal of Management*, *5*(1), 83–99. https://doi.org/https://tinyurl.com/mr2uft7d

Ezu, G. (2020). Effect of capital structure on financial performance of oil and gas companies quoted on the Nigerian Stock Exchange. *The International Journal of Business & Management*.

Felix, A. V. (2024). Financing the Nigerian oil and gas industry in the energy transition: Challenges and prospects. *International Journal of Economics, Business and Social Science Research*, *2*(6), 74–102. https://doi.org/https://tinyurl.com/yb8mcw5z

Gara, J. G., Abdullahi, M. N., Mohammed, Y., & Gana, J. (2025). The influence of capital structure on the financial performance of listed industrial goods companies in Nigeria. *Journal of Business Development and Management Research*, *7*(7), 183–200. https://doi.org/https://tinyurl.com/2eh7hsh4

Ghani, E. K., Hye, Q. M. A., Rehan, R., & Salahuddin, S. (2023). Examining capital structure determinants for ASEAN energy firms. *International Journal of Energy Economics and Policy*, *13*(3), 129–140. https://doi.org/https://tinyurl.com/5ejkhc4m

Gupta, A., & Chandra, P. (2024). To study capital structure and its relationship with financial performance. *International Journal of Novel Research and Development*, *9*(3), 481– 490.

Hutapea, A. A. B., & Sulistyowati, E. (2024). The role of agency cost as a mediator in the effect of capital structure on company financial performance. *Indonesian Journal of Sustainability Policy and Technology*, *2*(1), 1–18. https://doi.org/https://tinyurl.com/2txakb4k

Ikbal, A. (2023). The Influence of Intellectual Capital and Capital Structure on Financial Performance. *Ilomata International Journal of Tax and Accounting*, *4*(4), 913–927.

Kadhafi, I. M., Iyakaremye, J. D., Gasheja, F., Twesige, D., Mpiranya, J. M. V, Nabulega, C., Bosco, J. S., Claude, J. M., Bosco, J. R., Eugenie, B., & Rutungwa, E. (2024). Capital structure and financial performance of commercial banks in Rwanda. *Rwanda Journal of Social Sciences, Humanities and Business*, *3*(1), 60–73. https://doi.org/https://tinyurl.com/3j62vmmh

Kambi, M., & Kasoga, P. S. (2024). Capital structure and performance of small and medium enterprises: empirical evidence from Tanzania. *Vision, Journal of Business Perspective*.

Khaki, A. R., & Akin, A. (2020). Factors affecting the capital structure: New evidence from GCC countries. *Journal of International Studies*, *13*(1), 9–27. https://doi.org/https://tinyurl.com/yrxs8jsy

Khan, S., Akhtar, T., & Qasem, A. (2024). Dynamics of capital structure determinants: empirical evidence from GCC countries. *Future Business Journal*, *10*(1), 107. https://doi.org/https://tinyurl.com/mvx4xztn

Modiba, S. M. (2022). *Determinants of capital structure for the industrial sector on the JSE*. 1–92.

Muhammed, S., Desalegn, G., & Emese, P. (2024). Effect of capital structure on the financial performance of Ethiopian commercial banks. *Risks*, *12*(4), 69. https://doi.org/https://tinyurl.com/5e2anfwh

Myers, S. C. (2001). Capital structure. *Journal of Economic Perspectives*, *15*(2), 81–102. https://doi.org/https://tinyurl.com/yc7xnnj9

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/https://tinyurl.com/ms4v72jv

Mysaka, H., & Derun, I. (2021). Corporate financial performance and Tobin's Q in dividend and growth investing. *Contemporary Economics*, 276–288. https://doi.org/https://tinyurl.com/y79tnttr

Nassim, I., & Benraïss, B. (2024). Capital structure and financial performance of Moroccan agricultural small-and medium-sized enterprises: Moderating effects of government subsidies. *Journal of Risk and Financial Management*, *17*(7), 256. https://doi.org/https://tinyurl.com/472drn78

Ngoc, N. M., Tien, N. H., & Thu, T. H. (2021). The Impact of capital structure on the financial performance of logistic service providers listed on the Ho Chi Minh City stock exchange. *PalArch's Journal of Archaeology of Egypt/Egyptology*, *18*(2), 688–719. https://doi.org/https://tinyurl.com/y4vvy7mr

Nguyen, T., & Nguyen, H. (2020). Capital structure and firm performance of non-financial listed companies: Cross-sector empirical evidence from Vietnam. *Accounting*, *6*(2), 137–150. https://doi.org/https://tinyurl.com/4c95au8k

Onyemere, I. (2024). Intricate capital structure influence on firm performance: An empirical analysis of oil and gas firms in Nigeria. *African Journal of Business and Economic Research (AJBER*, *19*(3), 395–415. https://doi.org/https://tinyurl.com/3dad229r

Osho, G. S. (2025). Optimizing joint ventures and alternative funding for Nigeria's oil and gas industry: Improved financing and transitioning to commercial ventures. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev*, *10*(2), 10.

Prasad, N., Verma, M. K., Tanwar, N., & Kumar, M. (2024). Capital structure impact on firm performance: an empirical study of the pharmaceutical sector in India. *Economic Affairs*, *69*(2), 843–848. https://doi.org/https://tinyurl.com/mry747pe

Redjeki, F. (2022). *The Effect of value creation based on company performance on stock returns in manufacturing companies listed on the IDX*.

Said, S. (2025). The impact of capital structure on firm performance: Empirical evidence from Egypt. *Open Access Library Journal*, *12*(2), 1–16. https://doi.org/https://tinyurl.com/46avsdnk

Saputra, I. G. A. A., & Kusuma, P. S. A. J. (2025). The effect of liquidity, profitability, and capital structure on firm value with firm size as a variable. *American Journal of Economic and Management Business (AJEMB*, *4*(1), 24–42. https://doi.org/https://tinyurl.com/52jby7t9

Satyanarayana, K. T., & Rao, A. N. (2023). *Capital structure dynamics and financial performance in Indian banks (An Analysis of Mergers and Acquisitions*.

Segun, I. B., Olusegun, I. F., Akindutire, Y. T., & Thomas, O. A. (2021). Capital structure and financial performance: evidence from listed firms in the oil and gas sector in Nigeria. *International Journal of Innovative Science and Research Technology*, *6*(3), 180–187. https://doi.org/https://tinyurl.com/y3ktnr3j

Sike, R. I., Ibrahim, U. A., & Maitala, F. (2023). Capital structure and financial performance: a sectorial analysis. *Wseas Transactions on Business and Economics*, *20*, 1498–1508. https://doi.org/https://tinyurl.com/ycky437e

Singh, N. M., & Singh, S. A. (2023). A study of NSC-listed companies in India: Capital structure and financial performance. *Advances in Management*, *16*(1), 11–18. https://doi.org/https://tinyurl.com/2daafbs4

Szczepańska-Woszczyna, K., & Muras, W. (2023). Shareholders and the long-term ability of a company to value creation: The case of the IT sector. *Polish Journal of Management Studies*, *28*(2), 323–348. https://doi.org/https://tinyurl.com/y3v388k3

Tunde, L. M. (2021). *Oil and gas companies in Nigeria's 21st century: An analysis of the factors inhibiting their growth and operational performance*.

Udo, E. S., Jack, A. E., Okoh, J. I., Agbadua, O. B., Eke, R., & Onyemere, I. (2024). Intricate capital structure influence on firm performance: An empirical analysis of oil and gas firms in Nigeria. *African Journal of Business & Economic Research*, *19*(3), 395–415. https://doi.org/https://tinyurl.com/2fm6ynwa

Umamaheswaran, S., Dar, V., Prince, J. B., & Thangaraj, V. (2024). Risk perception as a barrier to renewable energy finance – A study of debt investors in the Indian context. *International Journal of Energy Sector Management*, *18*(6), 1511–1530. https://doi.org/https://tinyurl.com/yb483emu