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EFFECT OF FINANCIAL LEVERAGE ON FIRM VALUE OF LISTED OIL AND GAS FIRMS IN NIGERIA

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ABSTRACT: The study examined the effect of financial leverage on the firm value of listed oil and gas companies in Nigeria. The specific objective was to determine the effects of the total debt-to-equity ratio, the total debt-to-assets ratio, and the long-term debt-to-assets ratio on the net asset per share of listed and gas firms in Nigeria. The study deployed an ex-post facto research design. The population comprises nine (9) publicly listed oil and gas companies on the Nigerian Exchange Group. The selection of firms for the sample size was based on purposive sampling. In this study, specifically, five (5) out of the available nine (9) firms were chosen. Secondary data were extracted from annual reports of oil and gas companies over ten years, spanning from 2014 to 2023. The collected secondary data were coded into the statistical software EVIEWS Version 11. To test the hypotheses, Ordinary Least Squares regression analysis was conducted at a 5% significance level. The findings showed that: total debt to equity ratio has a negative but non-significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = -0.700522; p-value = 0.7772); total debt to asset ratio has a positive and significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = -82.91655; p-value = 0.0394); long term debt to asset ratio has a negative and significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = -111.0643; p-value = 0.0050). In conclusion, firms with substantial long-term debt may see a reduction in their net asset per share, reflecting the adverse effects of prolonged financial obligations. In light of the adverse effect of the long-term debt-to-assets ratio on net asset per share, the board of directors should implement policies to limit excessive long-term borrowing. They should prioritize financial strategies that maintain a balanced approach to long-term debt, ensuring that it does not compromise the firm's financial flexibility or lead to value erosion.

Keywords: Financial leverage, Firm value, Debt equity ratio, Oil and gas sector, Net asset per share

INTRODUCTION

Over the years, changes in corporate finance have been of significant importance to businesses, investors, and policymakers alike. A fundamental aspect of corporate finance is a firm's financial leverage, which some term the gearing structure 2021. Ronic and Amadi (2021) observed that the relationship between a firm's financial leverage and its performance, worth, or value has been a subject of ongoing exploration in global financial research. In this context, the specific focus of this study is on the Nigerian oil and gas sector, a critical component of the nation's economy.

Nigeria, a country with a growing economy, is home to a diverse range of industries and sectors, with oil and gas being one of the most substantial contributors to the nation's Gross Domestic Product (GDP). The financial leverage choices made by oil and gas companies in Nigeria have extensive implications for their financial health, operational efficiency, and, consequently, the growth prospects of the economy as a whole, hence the need to examine how the financial leverage decisions of these companies affect their value in the context of the Nigerian oil and gas sector.

Firm value, also known as company value or corporate value, is a financial metric that represents the overall worth of a business entity (Panda et al., 2023). It reflects the market's assessment of the company's assets, operations, future cash flows, growth potential, and other factors that contribute to its financial performance and outlook (Saka & Fatogun, 2021). On the other hand, financial leverage is the economic lifeblood of any organization, affecting not only day-to-day operations but also the firm's long-term strategic vision. This is because it helps define how a company has chosen to assemble and allocate its financial resources, which encompass a variety of elements such as debt, equity, and other forms of financing (Oke & Fadaka, 2021). At the daily operational level, financial leverage affects a firm's strategic capabilities, growth prospects, and resilience in the face of economic challenges (Essel, 2023). A company's financial choices can enable or hinder its expansion into new markets. The development of innovative products and their ability to weather economic storms (Musa, Matemilola & Bany-Ariffin, 2021).

In the world of finance, financial leverage represents the mix of a company's long-term debt, preferred equity, and common equity (Alfisah & Zulfikar, 2022). It is the allocation of these financial resources that largely determines a firm's risk, cost, and performance. Prior research in finance has identified several theories and models that attempt to explain the relationship between financial leverage and firm value. Modigliani and Miller's propositions, trade-off theory, pecking order theory, and agency theory are among the foundational frameworks that have provided insights into how firms choose their financial leverage (Nwafor, Yusuf, & Shuaibu, 2022; Mills & Mwasambili, 2022).

The optimal financial leverage for maximizing firm value varies depending on a company's industry, stage of development, risk tolerance, and market conditions. Thus, maximizing firm value requires that oil and gas companies assess and manage their financial leverage to strike the right balance between the advantages and disadvantages of debt and equity financing (Saka & Fatogun, 2021). The effect of financial leverage on firm value is often attributed to its role in shaping a company's cost of capital, financial risk, growth opportunities, tax implications, and investors' perception (Akmalia, 2023; Oktrima & Sutrisno, 2023). Financial leverage determines the company's weighted average cost of capital (WACC). WACC is the blended rate of return that a company needs to generate to meet investors' expectations. Debt usually has a lower cost (interest rate) than equity (the required rate of return by shareholders). Therefore, a higher proportion of debt in the financial leverage can reduce the overall cost of capital, making it more cost-effective for the company to raise funds (Boshnak, 2023). This, in turn, can increase firm value by enhancing profitability. Additionally, while debt can lower the cost of capital, it also introduces financial risk. Too much debt can lead to financial distress, as the company must make regular interest payments and repay principal amounts. Excessive debt levels can erode firm value by increasing the

probability of bankruptcy or financial difficulties, which may lead to a decrease in the company's stock price (Osasare, Ayo & Emmanuel, 2023).

Furthermore, equity financing provides flexibility since there are no obligatory interest or principal payments. Firms with a higher proportion of equity in their financial leverage may have more financial flexibility to invest in growth opportunities, such as research and development, acquisitions, or expansion. These growth initiatives can contribute to higher future cash flows and, consequently, increase firm value. Debt financing also offers tax benefits in the form of interest expense cash flows and, in turn, firm value. However, the tax benefits of debt should be weighed against the financial risk associated with higher leverage. Therefore, financial leverage that aligns with investor preferences can attract a broader investor base and support a higher stock price, thus increasing firm value (Ibrahim, 2017). In light of the above background, the present study examines the effect of financial leverage on the firm value of listed oil and gas companies in Nigeria.

Statement of Problem

This study is conducted to address a pressing issue stemming from the imbalanced composition of debt and equity within firms, which inherently heightens their risk profiles and jeopardizes financial stability, ultimately impacting market valuation.

The consequences of this suboptimal financial leverage scenario are manifold, as many companies become overburdened with debt, leading to increased financial distress and higher default risk. On the contrary, excessive reliance on equity financing severely limits the firm's growth potential, hindering its competitiveness and innovation (Aggarwal & Padhan, 2017). The imbalance between debt and equity financing, often exacerbated by limited capital market development, has constrained firms' ability to invest, expand, and navigate economic challenges effectively (Vo & Ellis, 2017). Furthermore, investors also face uncertainty in assessing the risk-return profile of these companies, which can lead to mispricing of securities and hinder capital market development.

Numerous prior investigations, including works by researchers such as Otrima and Sustrisno (2023); Essel (2023; Akmalia (2023), Bui, Nguyen and Pham (2023); Osasare, Ayo and Emmanuel (2023); Nwafor, Yusuf and Shuaibu (2022); Mills and Mwasambili (2022); Segun, Olusegun, Akindutire and Thomas (2021); Oboro and Peter (2021); Ronic and Amadi (2021); Trianti (2021); Oke and Fadaka (2021); Ahmad, Bakar and Islam (2021); Saka and Fatogun (2021); Musa, Matemilola and Bany-Ariffin (2021); Ibrahim (2017); and others, have assessed related issues. However, this study aims to address a gap in the existing literature by offering updated insights based on the most recent data available. By analyzing data from 2014 to 2023, the study ensures its relevance in the current context, providing fresh perspectives and findings that contribute to the ongoing discourse.

Objective of the Study

The specific objective is to ascertain the effect of total debt-to-equity/assets ratios on net assets per share for oil and gas firms in Nigeria. The study will be guided by the hypothesis that total debt-to-equity/assets ratios have no significant effect on net assets per share for oil and gas firms in Nigeria.

Significance of the Study

The study will have substantial significance for various stakeholders, including managers, investors, policymakers, financial analysts, and academia.

1) Oil and gas firms: For oil and gas companies, the hints gleaned from this study serve as a strategic compass, guiding them towards the optimization of their financial leverage to bolster firm value. By leveraging the findings, these companies can refine their decision-making processes, making them more data-driven and discerning. Armed with a deeper understanding of the intricate relationship between financial leverage and firm value, oil and gas businesses can tailor their financial strategies to better align with market dynamics and organizational objectives. This informed approach not only enhances their financial health but also augments their competitive position within the industry. Consequently, by capitalizing on the study's recommendations, oil and gas companies can navigate the market's complexities with greater agility and resilience, positioning themselves for sustained success and growth in the dynamic energy landscape.

Scope of the Study

This research examines the effect of financial leverage on firm value. Specifically, the study concentrates on a population of 9 oil and gas companies listed on the Nigerian Exchange Group. However, only firms with complete data from 2014 to 2024 will be sampled. The study encompasses a decade-long accounting period, spanning from 2014 to 2024. The independent variables encompass various aspects of financial leverage, including the total debt-to-equity ratio, the total debt-to-assets ratio, and the long-term debt-to-assets ratio. On the other hand, the dependent variable in this research is measured by net asset per share and represents the firm's value.

Limitations of the Study

The limited availability of secondary data constrains this study. Nevertheless, the researcher successfully overcame this obstacle by gathering information from fact books, annual reports, and accounts of selected oil and gas firms spanning multiple years. This approach was employed to scrutinize the formulated hypothesis, ensuring that the integrity and reliability of the findings remained unaffected.

Conceptual Framework

Financial leverage refers to the composition of a company's financial resources, including debt and equity, which determines its financial leverage (Bui, Nguyen & Pham, 2023). It can also be defined as the combination of debt and equity resources employed by a company to fund its activities, encompassing typical elements like ordinary share capital, preference share capital, and debt capital (Oke & Fadaka, 2021). These definitions are not prescriptive regarding the specific characteristics of the debts comprising the financial leverage, as these debts can encompass both short-term and long-term obligations (Ahmad, Bakar & Islam, 2021). Financial leverage refers to the relationship

between debt and equity used to finance corporate operations. Financial leverage addresses the implications on a firm's overall valuation and cost of capital when modifying the debt-to-equity ratio or leverage level (Adesunloro, 2021). In simpler terms, financial leverage refers to a blend of equity, comprising common shares and retained earnings, and debt, encompassing all interest-bearing obligations (Wardani et al., 2022).

A business entity can opt for various combinations of equity, debt, and other financial resources, with a primary focus on equity for maximizing the firm's market value (Trianti, 2021). Financial leverage encompasses the diverse financing choices a company uses to support its assets and significantly influences the firm's profitability. Within the broader financial structure, financial leverage is a subset that includes not only equity and debt but also short-term debt and accounts payable (Oke & Fadaka, 2021). In this context, financial leverage represents a blend of a company's long-term debt, specific short-term debt, common equity, and preferred equity (stock). Therefore, financial leverage can be defined as a company's financial leverage or the proportional relationship and ratios between the firm's debt and equity (Akeem, Terer, Kiyanjui & Kayode, 2014).

A firm's financial leverage encompasses both long-term funding sources, which consist of debt and equity financing, and short-term sources of finance (Anozie, Muritala, Ininm, & Yisau, 2023). A firm's financial leverage spans from internal financing to external financing, where internal financing primarily comprises retained earnings, while external financing includes both debt and equity financing. A firm's capital composition extends from internal finance, encompassing retained earnings, to external finance, which involves debt and equity (Essel, 2023).

Financial leverage refers to the strategy employed by a firm to fund its assets by blending various financial instruments, such as debt, equity, or hybrid securities (Abughniem et al., 2021). In this context, hybrid securities are a category of financial instruments that combine attributes of both debt and equity, offering fixed or floating interest rates and allowing the holder to convert them into the underlying company's shares (Oke & Fadaka, 2021). Financial leverage comprises the company's debt, including both long-term and short-term obligations, as well as common and preferred equity.

The objective of financial leverage management is to mix the firm's permanent sources of funds in a way that maximizes its value. Since the objective of a firm, on the one hand, is to maximize the value of the firm, the financial leverage decision, or capital structure, should be examined from the perspective of its impact on the firm's operating performance. Therefore, the financial leverage decision should be carefully designed initially. It is important for the financial managers of firms to set a target financial leverage, and financing should be structured to achieve it. Thus, proper planning of the composition of debt and equity is a sine qua non for sound financial management, since the debt-equity mix affects shareholders' earnings and risk, which in turn affect the cost of capital and the market value of the firm. An appropriate financial leverage decision may improve the firm's value and its solvency.

A business concern can pursue different levels of the mix of equity, debt, and other financial facilities, with equity emphasizing maximizing the firm's market value. Financial leverage refers to the various financial options available to a firm regarding an asset, and it affects the profitability

of that firm. Financial leverage is a component of a company's financial structure, which, in addition to the components of financial leverage, also includes short-term debt and accounts payable. Financial leverage in this case can be seen as a mix of a company's long-term debt, specific short-term debt, common equity, and preferred equity (stock). Thus, financial leverage could be referred to as the company's financial leverage, or the proportional relationship or ratios between its debt and equity.

The financial leverage of a firm includes both long-term sources of finance, such as debt and equity financing, and short-term sources of finance. Affirm's financial leverage ranges from internal to external financing. Internal financing primarily consists of retained earnings, while external financing includes debt and equity. The capital structure of a firm varies from internal finance, like retained earnings, to external finance, such as debt and equity.

The total debt to equity ratio measures the proportion of a company's total debt compared to its equity, reflecting the level of financial leverage and risk (Oboro & Peter, 2021). It is a key tool for assessing a company's financial structure by showing the balance between total debt—which includes both long-term and short-term obligations—and equity, which represents shareholders' ownership in the company (Oke & Fadaka, 2021). A high ratio indicates that the company depends heavily on borrowed funds to finance its activities, implying a more leveraged financial structure.

This ratio is a key element in risk assessment. A high total debt-to-equity ratio indicates a significant debt burden and potential financial risk (Segun et al., 2021). Companies with a high debt ratio may encounter greater difficulties servicing debt, especially during economic downturns or when facing unexpected financial setbacks. The ratio shows how much a company is willing to use financial leverage. A high ratio can help companies grow quickly and expand by using borrowed funds, potentially increasing returns on equity (Ahmad, Bakar & Islam, 2021). However, it also raises financial risk.

The total debt-to-equity ratio is a key indicator of a company's creditworthiness. Lenders and creditors take this ratio into account when assessing the firm's ability to meet its debt obligations (Oboro & Peter, 2021). A lower ratio may improve creditworthiness, potentially leading to better loan terms and lower borrowing costs. Companies can use this ratio to guide their strategic decision-making. A high ratio may encourage management to explore opportunities for expansion, acquisitions, or investments, while a lower ratio may steer the company toward a more conservative approach.

Thus, the total debt-to-equity ratio is a powerful tool for understanding a company's financial choices, risk appetite, and investment potential. It helps provide a meticulous perspective on a firm's financial leverage, resource allocation, and risk-return dynamics. By calculating the proportion of total debt relative to equity, this ratio enables stakeholders to make informed decisions that align with their financial goals and risk tolerance (Anozie, Muritala, Ininm & Yisau, 2023), while offering a window into the company's financial health and investment attractiveness.

Total Debt to Asset Ratio

Total debt to asset ratio measures the ratio of a company's total debt relative to its total assets, indicating the extent to which assets are financed by debt. The total debt to asset ratio is a fundamental financial metric that reflects a company's leverage and risk profile (Anozie, Muritala, Ininm & Yisau, 2023). It quantifies the relationship between a firm's total indebtedness and the assets that form the foundation of its operations. This ratio plays a crucial role in evaluating a company's leverage structure. It breaks down the composition of assets, revealing how much of them are funded by debt. A high ratio indicates a significant portion of assets financed through borrowing, pointing to a more leveraged financial structure (Oboro & Peter, 2021).

This ratio is a crucial part of risk assessment. A high total debt to asset ratio indicates that a significant portion of the company's assets are subject to debt repayment obligations, which can increase financial risk (Segun, Olusegun, Akindutire & Thomas, 2021). It reflects the company's dependence on borrowed funds to finance its operations. Conversely, a lower total debt to asset ratio indicates a more cautious approach to asset financing, with a larger share of assets funded through equity or retained earnings.

Theoretical Review

Trade-off Theory

Myers and Majluf (1984) proposed the Trade-off Theory, which suggests that each firm has an optimal capital structure determined by balancing the costs and benefits of debt financing (Mutegui, 2016). According to this theory, firms must decide how much debt and equity to include in their capital structure by weighing the costs and benefits of each source. The theory highlights the benefits of debt financing, such as tax shields, while also acknowledging that high levels of debt increase the risk of bankruptcy and agency expenses (Kithandi, 2019). The theory highlights the benefits of debt financing, such as tax shields, but also acknowledges the potential risks, including increased bankruptcy likelihood and agency costs associated with high debt level.

Moreover, trade-off theory suggests that as firms increase debt in their capital structure, the marginal costs of debt rise while the marginal benefits decline until reaching an optimal point. Beyond this threshold, the marginal costs of debt outweigh the benefits, leading to a decrease in firm value. Therefore, firms are advised to establish an optimal financial structure that effectively balances debt tax shields against bankruptcy costs to enhance their corporate performance. In addition, the theory asserts that as firms increase debt in their capital structure, the marginal cost of debt increases while the marginal benefits decrease until reaching an optimal point (Nwadialor, Akaji & Agubata, 2021). Beyond this point, the marginal costs of debt exceed the marginal benefits, resulting in reduced firm value.

Therefore, firms must establish an optimal financial structure to enhance their corporate performance (Uzokwe, 2019). According to this theory, firms are expected to evaluate the various costs and benefits of each debt level to determine an optimal debt structure that effectively balances debt tax shields against the costs of bankruptcy, i.e, the marginal costs and benefits. The relevance

of this theory to the hypotheses of the current study lies in its proposal that firms should continue to use debt financing once an optimal debt structure has been identified, as this would maximize the firm's corporate value.

Empirical Review

Bui, Nguyen, and Pham (2023) investigated the effect of leverage on firms' value in the Vietnamese stock market. The study used a rich dataset extracted from the audited financial statements of 769 companies, spanning the period 2012 to 2022, yielding 8,459 observations. The study employed a diverse array of estimation methods, including ordinary least squares (OLS), fixed effects model (FEM), random effects model (REM), and generalized least squares (GLS). It was found that the debt ratio exhibited a positive impact on Tobin's Q. In contrast, the long-term debt ratio did not significantly influence firm value. Surprisingly, both short-term and long-term ratios wielded adverse effects on Tobin's Q.

Anozie, Muritala, Ininm, and Yisau (2023) examined the effect of leverage and financial performance among Nigerian oil and gas companies. Employing an ex-post facto research methodology, they assessed variables such as short-term debt to total assets, long-term debt to total assets, total debt to total equity, and return on assets as proxies for capital structure and financial performance. The data was sourced from the annual financial reports of five Nigerian oil and gas companies, covering the years 2011 through 2020. Through the lens of descriptive statistics and panel regression analysis, their findings revealed that while long-term debt to total assets had a statistically significant negative impact on return on assets, both short-term debt to total assets and total debt to total equity had positive but statistically insignificant effects.

Osarare, Ayo, and Emmanuel (2023) examined the impact of leverage and agency costs on the value of non—financial listed firms in Nigeria from 2011 to 2020. A panel regression technique was adopted to test the hypothesis. The findings of the study revealed that there is a positive and significant effect of asset tangibility and operating expenses to sales on the value of the non-financial firms in Nigeria. The interactive effect reveals that a negative effect of the long-term debt ratio on return on assets (ROA) is increased for firms with high agency problems. Additionally, the study discovered that the positive effect of debt to assets on return on assets (ROA) is reduced for firms with high agency problems. Based on the findings, the study recommended that managers should use debt as a source of finance with the utmost efficiency since it is relevant in determining the value of the firm. The report also suggested that shareholders use various methods to monitor agents so they can be held accountable for any debt necessary to increase the firm's value.

Boshnak (2023) determined the effect of leverage on the performance of firms listed on the Saudi Stock Exchange (Tadawul). Using a panel of 350 firm-year observations from 70 Saudi non-financial listed companies spanning 2016 to 2020, the study employed a generalized method of moments (GMM) estimation to facilitate hypothesis testing while addressing issues of autocorrelation, heteroscedasticity, and endogeneity. The extensive analysis results revealed that short-term debt, long-term debt, total debt, and debt-to-equity ratios had a significant negative impact on firm operational performance, measured by return on assets. Additionally, long-term

debt, total debt, and debt-to-equity ratios also showed a notable adverse effect on firm financial performance (return on equity) and market performance, as indicated by Tobin's Q.

Akmalia (2023) assessed the relationship between leverage and firm value in the manufacturing industry sector, spanning five periods from 2016 to 2020. Employing a quantitative approach and the purposive sampling technique, the research conducted hypothesis testing through multiple linear regression and moderated regression analysis (MRA) using EViews 12. The results unveiled that, in this context, capital structure did not exert a statistically significant impact on firm value.

Oktrima and Sutrisno (2023) assessed the influence of leverage on firm value in Indonesia. The research encompassed various statistical tests and analytical methods to draw meaningful conclusions. Firstly, they performed essential assumption tests, including checks for normality, multicollinearity, autocorrelation, and heteroscedasticity. Additionally, their analytical approach encompassed simple linear regression, multiple linear regression, hypothesis testing (t-tests and F-tests), and the coefficient of determination. This research adopted a quantitative research methodology, as the data collected consisted of numerical values, and statistical tools were employed for analysis. The data utilized in this study was secondary data, sourced from annual financial reports published on the Indonesia Stock Exchange (IDX). The analysis indicated that the Debt-to-Equity Ratio (DER) did not significantly influence firm value.

Mills and Mwasambili (2022 examined the causal relationship between leverage and firm value in Ghana, covering the period from 2010 to 2017 and focusing on financial statements from 38 companies listed on the Ghana Stock Exchange. Their methodology involved a series of statistical procedures, including panel unit root tests, cointegration methods, panel FMOLS (Fully Modified Ordinary Least Squares), DOLS (Dynamic Ordinary Least Squares), and Granger causality tests. The study revealed that, in the context of long-run causal relationships, capital structure indices had a significant impact on firm value.

Nwafor, Yusuf, and Shuaibu (2022) investigated the impact of leverage on profitability, as measured by return on assets, in the pharmaceutical sector in Nigeria, spanning the period from 2011 to the 2020 financial year. They formulated specific objectives, research questions, and hypotheses for their study. Using an ex post facto research design, they relied on secondary data from the annual financial reports of four listed pharmaceutical companies. Data analysis involved pooled ordinary least squares regression, as well as preliminary analysis such as descriptive statistics and correlation analysis. Their findings revealed that approximately 30.9% of the total variation in return on assets could be explained by variations in the capital structure variables included in the model. Additionally, the study found a negative relationship between the Total Debt Ratio (TDR) and the profitability of pharmaceutical firms in Nigeria, while the Debt Equity Ratio (DER) exhibited a positive relationship with profitability in the same context.

Fauzi, Achsani, Andati, and Anggraeni (2022) analyzed the impact of leverage on the performance of telecommunication firms. Firm performance was measured by return on assets, while capital structure was proxied by the ratio of debt to total assets. Their datasets encompassed telecommunications firms across 62 countries over the period from 2010 to 2020. They conducted their analysis using a dynamic data panel regression model, employing the generalized method of

moments approach. The empirical results of their study indicated that capital structure significantly influenced the performance of telecommunications firms in both developed and developing countries, as well as in integrated and wireless telecommunication firms.

Alfisah and Zulfikar (2022) examined the effects of capital structure on firm value, financial performance, and the combined influence of capital structure and financial performance on firm value. Their study focused on Food and Beverage companies listed on the Indonesia Stock Exchange (IDX) from 2016 to 2020. The data analysis involved a simple multiple regression model, considering both dependent and independent variables in numerical form with size scales. The study's results indicated that capital structure had no significant impact on firm value.

Musa, Metemilola, and Bany-Arriffin (2021) conducted a study focusing on the impact of capital structure on the performance of nonfinancial firms in Africa. The research employed a two-step System Generalized Method of Moments to analyze panel data comprising 406 firms from eight African nations during the period 2010 to 2018. The study uncovered compelling evidence indicating that capital structure positively influences the performance of firms in these African nations. The results suggest that companies in Africa tend to favour debt financing as a significant component of their capital structure, primarily to harness the interest tax shield, which ultimately enhances their performance and firm value.

Saka and Fatogun (2021) investigated the relationship between capital structure and the value of manufacturing firms in Nigeria. They used an Ex-post Facto research design and randomly selected 10 manufacturing firms across six sectors within the Nigerian manufacturing industry. Using balanced panel data with Panel (OLS) regression techniques, they analyzed 180 observations. The results from the preferred random effects estimation, at a 5% level of significance, showed that capital structure metrics such as debt-to-equity and debt-to-total assets had insignificant effects on firm value when measured by Tobin’s Q.

Ronic and Amadi (2021) examined how capital structure (leverage) affects the value of 52 non-financial firms listed on the Nigerian Stock Exchange, an emerging market, over a six-year span from 2015 to 2019. Their analysis employed cross-sectional regression, Pearson correlation, and descriptive statistical methods. The findings showed a positive link between the total debt to total assets ratio and short-term debt to total assets ratio with firm value, while a negative link was observed between long-term debt and firm value. Based on these results, and in line with previous research, the study concluded that there is a relationship between capital structure (leverage use) and firm value. Furthermore, the study indicated that capital structure carries various implications that impact a company’s overall worth.

Oboro and Peter (2021) examined how optimizing capital structure affects the performance metrics of ten multinational companies from 2010 to 2019. The study used Total Debt to Equity Ratio (TDER), Total Debt to Total Asset Ratio (TDAR), Short-term Debt to Asset Ratio (SDAR), and Long-term Debt to Total Asset Ratio (LDAR) as indicators of capital structure, while Return on Equity (ROE) served as a performance proxy. Data were collected from the annual reports of the sampled multinationals over the study period. Panel data methods were applied, and the study favored the fixed effect model, as indicated by the Hausman test. Results showed that TDER had a

negative and significant effect on the ROE of multinational companies in Nigeria. Meanwhile, both TDER and SDAR showed a positive but insignificant impact on ROE, and the LDAR ratio had a negative yet insignificant effect on ROE.

Segun, Olusegun Akinduttire, and Thomas (2021) investigated the relationship between capital structure and financial performance in Nigeria's oil and gas sector. They used an Ex-post Facto research design, covering all 12 listed oil and gas firms in Nigeria, with a random sample of 10 firms. The study spanned a decade, from 2010 to 2019, and analyzed financial reports from the selected companies. Regression analysis was performed on the panel data, including pooled Ordinary Least Squares (OLS) estimation, fixed effect estimation, and random effect estimation. The findings showed that total debt ratio, long-term debt ratio, and short-term debt ratio had a negative impact on return on assets, with only the short-term debt ratio being statistically significant. In contrast, the debt-equity ratio had a positive and significant effect on return on assets.

Natsir and Yusbardini (2020) examined how capital structure affects the valuation of manufacturing companies listed on the Indonesia Stock Exchange (IDX) between 2013 and 2017. They used the Price to Book Value (PBV) ratio as the dependent variable to assess firm value. Their independent variables included the Debt-to-Equity Ratio (DER) as a measure of capital structure and the natural logarithm of total assets as a proxy for firm value. This study used secondary data from the financial statements of 17 publicly traded companies. The analytical methods included multiple regression of panel data, path analysis, and the Sobel test. Their results showed that capital structure had a statistically significant impact on both profitability and firm value.

In another study, Putri and Rahyuda (2020) assessed the relationship between capital structure, sales growth, profitability, and firm value among consumer goods industrial firms listed on the Indonesia Stock Exchange from 2013 to 2018. They used the Debt-to-Equity Ratio (DER) as a proxy for capital structure, Sales Growth (SG) as a proxy for sales growth, Return on Assets (ROA) as a proxy for profitability, and Price to Book Value (PBV) as a measure of firm value. Their data, collected from annual reports of 51 companies, was analyzed using purposive sampling to select the research sample. Their study revealed that DER had a significant negative impact on ROA, SG had a significantly positive effect on ROA, but DER did not affect PBV. Furthermore, SG had a significantly positive impact on PBV, and ROA acted as a mediator in the relationship between DER, SG, and PBV.

Vo and Ellis (2017) explored the link between capital structure and shareholder value in Vietnam, using accounting and stock market data from firms listed on the Ho Chi Minh City stock exchange during the period from 2007 to 2013. Their analysis uncovered a negative relationship between financial leverage and shareholder value, suggesting that the costs of debt financing outweighed the benefits for Veitnamese firms. They also found that only firms with low leverage were likely to create value for their shareholders.

Aggarwal and Padhan (2017) investigated the effects of capital structure and firm quality on the valuation of selected Indian hospitality firms listed on the Bombay Stock Exchange (BSE) from 2001 to 2015. They considered variables such as firm quality measured by the Altman Z-score, leverage, size, profitability, tangibility, growth, liquidity, as well as macroeconomic variables such

as GDP growth and inflation. The study employed panel data techniques, including pooled OLS, fixed effects, and random effects models. Their findings revealed a significant relationship between firm value and firm quality, leverage, liquidity, size, and economic growth.

Ezirim, Ezirim, and Momodu (2017) examined the impact of leverage on the valuation of firms listed on the Nigerian Stock Exchange. They employed econometric modeling and estimations using the generalized linear model (Quadratic Hill Climbing) technique. Diagnostic tests for normality, stationarity, and stability were carried out using Jaque-Bera, the augmented Dickey-Fuller, and Ramsey RESET procedures. Their results indicated that the variables were normally distributed, stationary, and possessed stable coefficients. Importantly, the study found that capital structure had a statistically significant impact, contrary to the classical argument proposed by Modigliani and Miller (1958), and that leverage was negatively and significantly associated with firm value, contradicting both traditional and modified Modigliani and Miller theories.

Ibrahim (2017) analyzed the impact of capital structure on the value of the Nigerian manufacturing industry over the period 2012–2016. The study sourced its data from the Nigeria Stock Exchange (NSE) fact book and employed conditional probability models, specifically probit analysis. Eight different variables related to capital structure were assessed to determine their influence on firm value, measured by Tobin's Q. The findings revealed a significant negative correlation between leverage and firm value.

Pratiwi (2016) explored the relationship between capital structure and the firm value of 22 banking companies listed on the Indonesia Stock Exchange (IDX) during the period 2010 – 2013. The study utilized multiple regression analysis to examine this connection. The statistical tests, however, indicated that, when considered individually, capital structure did not significantly influence firm value.

Antwi, Mills, and Zhao (2012) assessed the impact of capital structure on the value of 34 companies listed on the Ghana Stock Exchange (GSE) for the fiscal year ending December 31, 2010. The study used the ordinary least squares regression method. The results revealed that, especially in an emerging economy like Ghana, equity capital plays a vital role in determining a firm's value. Additionally, the study found that long-term debt is the main factor influencing a firm's value. Based on these findings, financial decision-makers are advised to consider prioritizing long-term debt over 'equity capital' when financing their operations, as it shows a more significant effect on a firm's overall value.

Research Design

To carry out an examination of the effect of financial leverage on the firm value of listed oil and gas companies in Nigeria, the study deployed an ex-post factor research design. This design was chosen for the study for two reasons: it enables researchers to test for a possible relationship between two or more variables, and it uses data that are extracted from historical occurrences to conclude. That is to say, the researcher has no power to influence the data as they have already taken place some time ago. In this scenario, the findings are deemed to be more reliable and less distorted.

Population of the Study

The research focuses on the entire set of oil and gas companies that are publicly listed on the Nigerian Stock Exchange (NSE). As of January 19, 2023, there are a total of nine oil and gas companies listed on the NSE, and they are identified as follows:

1. Capital Oil Plc
2. Conoil Plc
3. Eterna Plc
4. Japaul Oil & Ventures Plc
5. MRS Oil Nigeria Plc
6. Oando Plc
7. Rak Unity Petroleum Plc
8. Seplat Nigeria Petroleum Plc
9. Total Energies Nigeria Plc

Sample Size and Sampling Technique

The selection of firms for the sample size was based on purposive sampling. In this study, specifically, five (5) out of the available nine (9) firms were chosen due to data availability. The annual financial statements of these five selected oil and gas companies were collected for variable computation and analysis, spanning the financial years 2014 to 2023. The selected oil and gas companies in Nigeria include Total Energies Plc, Conoil Plc, Eterna Plc, Japaul Oil & Ventures Plc, and MRS Oil Nig. Plc.

Method of Data Collection

For this study, the researcher employed a secondary data source, relying on information from annual reports, accounts, and financial statements. These secondary data sources were utilized exclusively, enabling the researcher to compute both the independent and dependent variables. The data was extracted from five oil and gas companies operating in Nigeria. A ten-year period, spanning from 2014 to 2023, was considered for the analysis and examination of the relevant variables.

Method of Data Analysis

The collected secondary data were coded into the statistical software EVIEWS Version 11. This software was used to perform a descriptive analysis of the data using statistical measures such as the mean, maximum, minimum, and standard deviation. The mean was used as a measure of central tendency to determine the average value of the data, while the standard deviation was used as a measure of dispersion, indicating the extent to which the data deviated from the mean.

To test the hypotheses, Ordinary Least Squares regression analysis was conducted at a 5% significance level. The choice of the ordinary least squares regression technique is well-justified given its widespread use in analyzing relationships between variables. This technique is particularly effective for identifying potential cause-and-effect associations between two variables, making it a

suitable approach for testing the hypothesis that financial leverage affects firm value. By employing this technique, the study endeavours to uncover any potential patterns or trends among the variables under investigation, thereby adding substantial value to its conclusions.

Model Specification

The financial leverage proxies include the total debt-to-equity ratio (TDE), the total debt-to-assets ratio (TDA), and the long-term debt-to-assets ratio (LTDA). The dependent variable, firm value, is denoted as Net asset per share (NPS). The functional representation of the relationship between these variables is as follows:

$$NPS = f(TDE, TDA, LTDA \ldots..) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ eqn (i)}$$

For better estimation, a multiple econometric model was developed from eqn (i) as follows:

$$NPS_{it} = a_0 + b_1TDE_{it} + b_2TDA_{it} + b_3LTDA_{it} + \mu_{it} \ldots\ldots\ldots \text{ eqn (ii)}$$

Where:

NPS	=	Net Asset per Share
TDE	=	Total Debt to Equity Ratio
TDA	=	Short=term Debt to Asset Ratio
LTDA	=	Long-term Debt to Asset Ratio
a_0	=	Constant
b_{1-3}	=	Coefficients of the independent variables
μ	=	Disturbance
i	=	Firm of interest
t	=	Period of interest

Measurement of Variables

In the study, financial leverage is the independent variable and is represented by the total debt-to-equity ratio, total debt-to-asset ratio, and long-term debt-to-asset ratio. Conversely, firm value is the dependent variable and is represented by net assets per share.

Operational Measurement of Variables

Variables	Type of Variable	Description and Measurement
1. Net Asset Per Share	Dependent	Asset – Liability / Number of Shares
2. Total Debt to Equity Ratio (TDE)	Independent	Total Liabilities / Total Equity
3. Total Debt to Asset Ratio (TDA)	Independent	Total Liabilities / Total Asset
4. Long-term Debts to Asset Ratio (LTDA)	Independent	Noncurrent Liabilities / Total Asset

Presentation and Descriptive Analysis of Data

The researcher utilized secondary data collection methods, relying on information from annual reports, accounts, and financial statements. These sources were used exclusively to compute the independent variables for the study. Data were extracted from five oil and gas companies operating in Nigeria, covering the period 2014 to 2023, for analysis and examination of relevant variables. Net Asset Per Share (NPS), Total Debt to Equity Ratio (TDE), Total Debt to 2Asset Ratio (TDA), and Long-term Debts to Asset Ratio (LTDA).

Presentation of Data for Net Asset Per Share

Firm/Year	Conoil Plc	Eterna Plc	Japaul Oil	MRS Oil	Total Energies
2014	23.19	6.14	2.24	66.34	46.92
2015	25.52	7.10	1.13	68.83	47.84
2016	26.61	8.01	-2.34	72.72	83.13
2017	25.78	9.28	-4.03	75.82	83.13
2018	26.37	9.74	-5.00	67.98	90.51
2019	28.05	9.45	1.50	62.69	83.41
2020	28.13	10.23	1.42	55.26	82.91
2021	31.40	9.30	.94	56.38	122.58
2022	36.04	10.19	-.45	53.95	148.11
2023	47.41	2.93	.51	65.94	165.17
2024	48.1	3.0	-52	67.6	176.11

Source: Researcher's Computation (2025)

Presentation of Data for Total Debt to Equity Ratio

Firm/Year	Conoil Plc	Eterna Plc	Japaul Oil	MRS Oil	Total Energies
2014	4.44	1.25	1.72	1.86	5.00
2015	2.92	2.01	3.97	2.19	4.15
2016	2.78	1.98	-3.66	2.67	4.81
2017	2.51	2.89	-2.15	1.69	2.83
2018	2.33	3.15	-1.82	1.62	3.31
2019	2.27	1.30	1.87	1.31	3.72
2020	1.50	1.68	1.11	1.18	4.10
2021	1.48	2.80	1.96	1.17	4.02
2022	1.64	3.07	-4.12	1.19	5.12
2023	2.28	14.80	4.08	1.42	5.69

Source: Researcher's Computation (2024)

Presentation of Data for Total Debt to Asset Ratio

Firm/Year	Conoil Plc	Eterna Plc	Japaul Oil	MRS Oil	Total Energies
2014	.82	.56	.63	.65	.83
2015	.74	.67	.80	.69	.81
2016	.74	.66	1.38	.73	.83
2017	.72	.74	1.87	.63	.74
2018	.70	.76	2.22	.62	.77
2019	.69	.56	.65	.57	.79
2020	.60	.63	.53	.54	.80
2021	.60	.74	.66	.54	.80
2022	.62	.75	1.32	.54	.84
2023	.70	.94	1.33	.59	.85

Source: Researcher's Computation (2024)

Descriptive Statistical Analysis of the Data

	NPS	TDE	TDA	LTDA
Mean	39.25525	2.421397	0.789067	0.174371
Median	27.33144	2.227513	0.721465	0.038019
Maximum	165.1667	14.79673	2.222321	1.801022
Minimum	-5.000441	-4.115796	0.525038	0.001791
Std. Dev.	39.84979	2.638445	0.318472	0.366501
Skewness	1.150522	1.482663	2.908411	3.118671
Kurtosis	4.128607	11.91598	11.94099	12.57962
Jarque-Bera	13.68449	183.9329	237.0348	272.2366
Probability	0.001068	0.000000	0.000000	0.000000
Sum	1962.762	121.0698	39.45334	8.736554
Sum Sq. Dev	77812.27	341.1082	4.969802	6.581844
Observation	50	50	50	50

Source: Eviews 10 Statistical Software (2024)

Ordinary Least Squares Regression Analysis

Dependent Variable: NPS

Method: Least Squares

Date: 08/05/24 Time: 02:37

Sample: 150

Included Observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TDE	.0700522	2.461023	-0.284647	0.7772
TDA	82.91655	39.10848	2.120168	0.0394
LTDA	.111.0643	37.63473	-2.951111	0.0050
C	-5.068818	24.02275	-0.211001	0.8338

R-squared	0.247479	Mean dependent var	39.25525
Adjusted R-square	0.198402	S.D. dependent var	39.84979
S.E of regression	35.67831	Akaike info criterion	10.06358
Sum squared resid	58555.33	Schwarz criterion	10.21654
Log likelihood	-247.5895	Hannan-Quinn criterion	10.12183
F-statistic	5.042633	Durbin-Watson stat	0.310589
Prob(F-statistic)	0.004191		

Source: Eviews 10 Statistical Software (2024)

The trend in net asset per share (NPS) for the firms listed shows a generally upward trajectory for most companies from 2014 to 2023, with notable exceptions and fluctuations. Conoil Plc exhibits a consistent increase in NPS, rising from 23.19 in 2014 to 47.41 in 2023. Eterna Plc's NPS also demonstrates growth, although the rate of increase has shown in recent years, peaking at 10.19 in 2022 before a slight decline in 2023. Japaul Oil's performance shows considerable volatility with negative values in several years, but it recovers slightly towards the end of the period. MRS Oil displays a relatively stable yet modest increase, peaking in 2017 and then slightly declining before a modest recovery in 2023. Total Energies shows significant growth, especially after 2016, with it NAPS rising from 46.92 in 2014 to an impressive 165.17 in 2023. Overall, while the trend indicates growth for most firms, the rate of increase varies significantly among them, reflecting differing financial health and operational efficiency.

Findings

To test the hypothesis, Ordinary Least Squares regression analysis was conducted at a 5% significance level. The findings showed that:

1) Total debt to equity ratio has a negative but non-significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = - 0.700522; p-value = 0.7772)
2) Total debt to asset ratio has a positive and significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = 82.91655; p-value = 0.0394)

Discussion of Findings

The analysis reveals that the total debt to equity ratio has a negative effect on the net asset per share (β = -0.700522) of the listed oil and gas firms in Nigeria. This outcome suggests that as he proportion of debt relative to equity increases, the net asset per share decreases. A plausible explanation for this result is the increased financial risk associated with higher debt levels. When firms rely heavily on debt, especially in a volatile industry like oil and gas, the risk of default increases, leading to higher interest costs and potentially eroding the firm's value. Additionally, investors may perceive the high debt levels as a sign of financial distress, which could negatively impact the firm's market valuation. Oktrima and Sutrisno (2023) found that the debt-to-equity ratio did not significantly influence firm value. Additionally, Alfisah and Zulfikar (2022) reported no significant impact of capital structure on firm value in the food and beverage sector, aligning with the notion of limited significance of the total debt-to-equity ratio. On the other hand, Mills and Mwasambili (2022) observed significant effects of capital structure on firm value, suggesting that the relationship may vary depending on the specific metrics and industry focus. Lastly, Ezirim and Momodu (2017) reported a negative and significant relationship between leverage and firm value, underscoring the variability in how debt ratios affect financial metrics.

Conversely, the total debt-to-assets ratio has a positive effect on net asset per share (β = 82.91655) for these firms. The finding implies that an increase in the proportion of debt relative to total assets enhances the firm's net asset per share. The positive effect could be attributed to the efficient use of debt to finance productive assets, which generates returns that exceed the cost of borrowing. In this scenario, the firm benefits from the leverage by increasing its asset base, which, in turn, boosts its net assets per share. This outcome suggests that while debt can be risky, it can also be a powerful tool for enhancing firm value when managed effectively. Bui, Nguyen, and Pham (2023) found that the debt ratio positively influenced firm value, suggesting that higher debt relative to assets can enhance net asset per share. Similarly, Segun et al (2021) reported a positive effect of debt ratios on return on assets in the oil and gas sector, highlighting a potential positive relationship with net asset per share. However, Boshnak (2023) found that total debt ratios negatively impacted return on assets, indicating that while debt can increase net assets, its impact on other performance measures might be negative. Furthermore, Nwafor, Yusuf, and Shuaibu (2022) observed a positive relationship between total debt and profitability.

Finally, the long-term debt-to-assets ratio has a negative effect on net asset per share (β = -111.0643) for listed oil and gas firms in Nigeria. This result indicates that higher levels of long-term debt relative to assets diminish the firm's net asset per share. Long-term debt often involves higher interest payments and a longer commitment, which may strain the firm's financial resources over time. In the oil and gas sector, where revenues can be unpredictable due to fluctuating oil prices and regulatory challenges, the burden of long-term debt can significantly impact the firm's financial stability and asset valuation. As a result, firms with substantial long-term debt may see a

reduction in their net asset per share, reflecting the adverse effects of prolonged financial obligations. Anozie et al (2023) found that long-term debt had a statistically significant negative impact on return on assets, suggesting that increased long-term debt can adversely affect financial metrics. Ronic and Amadi (2021) also reported a negative relationship between long-term debt and firm value, reinforcing the idea that long-term debt can reduce net asset per share. Additionally, Boshnak (2023) observed that long-term debt ratios had a significant negative impact on Tobin's Q, indicating broader negative effects of long-term debt. Furthermore, Oboro and Peter (2021) found a negative and significant impact of long-term debt on return on equity.

Conclusion

Financial leverage, the use of debt to finance a firm's operations, is a critical factor influencing the value of firms, particularly in capital-intensive industries like oil and gas. Understanding the relationship between leverage and firm value helps stakeholders, including investors and managers, make informed decisions. As firms increase their reliance on debt relative to equity, the value of their net assets, as reflected in the net asset per share, declines. This result can be attributed to the heightened financial risk associated with high levels of debt. In addition, the effective use of debt in financing productive assets that generate significant returns boosts the firm's net assets. In the oil and gas industry, debt is often used to finance large-scale projects that have the potential to increase asset value and profitability significantly. Finally, the burden of long-term debt can limit a firm's financial flexibility, making it more vulnerable to market downturns and further reducing its net asset value. In conclusion, the effects of financial leverage on firm value in Nigeria's oil and gas sector are complex and depend on the specific leverage metrics considered. While debt can enhance firm value when used judiciously, excessive reliance on debt, especially long-term debt, can lead to negative outcomes, underscoring the importance of balanced financial management in this industry. The above conclusion is based on the findings below:

1) Total debt to equity ratio has a negative but non-significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = -0.700522; p-value = 0.7772)
2) Total debt to asset ratio has a positive and significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = 82.91655; p-value = 0.0394)
3) Log-term debt to asset ratio has a negative and significant effect on the net asset per share of listed oil and gas firms in Nigeria (β = -111.0643; p-value = 0.0050)

Recommendations

1) Given the negative impact of the total debt to equity ratio on the net asset per share, it is recommended that financial managers of listed oil and gas firms in Nigeria should carefully manage the balance between debt and equity financing. They should consider reducing reliance on debt relative to equity to mitigate financial risk and enhance shareholder value.
2) Since the total debt-to-asset ratio has a positive effect on the net asset per share, investment committees within these firms should strategically use debt to finance productive assets that can generate substantial returns. They should ensure that debt is employed in projects with high return potential to increase the firm's net assets.

3) In light of the negative effect of long-term debt to asset ratios on net asset per share, the board of directors should implement policies to limit excessive long-term borrowing. They should prioritize financial strategies that maintain a balanced approach to long-term debt, ensuring that it does not compromise the firm's financial flexibility or lead to value erosion.

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