

**CAPITAL STRUCTURE AND FIRM PERFORMANCE IN THE OIL AND  
GAS SECTOR IN NIGERIA.**

**BY**

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AND GAS SECTOR IN NIGERIA.**

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF  
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DEGREE IN BANKING AND FINANCE**

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## DECLARATION

I declare that:

This project work is based on my study submitted to the Department of Finance, Faculty of Management Sciences, University of Benin under the supervision of **Dr. O.G. Omorokunwa**. All ideas and views are product of my personal research, effort and where the views of others were been expressed, referenced and duly acknowledged.

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## CERTIFICATION

This is to certify that this research work titled “Capital structure and firm performance in the oil and gas sector in Nigeria” was submitted by TREASURE ONYINYE OJIFE with Matriculation Number **MGS2003511** for the award of Bachelor of Science (B.Sc) degree in Banking and Finance, University of Benin, Benin City.

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## **DEDICATION**

This project work is dedicated to God Almighty for His abundant grace in my life and for seeing me through my academic pursuit and aspirations. He has been my source of strength, and happiness. And also to my parents [MR/MRS OJIFE) and my wonderful siblings whose unwavering support, encouragement, and sacrifices have been the cornerstone of my academic journey. Their belief in my potential has always been a source of strength and motivation. And all I can say is thank you, God bless you all.

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## **ABSTRACT**

This study examines the impact of capital structure on firm performance among oil and gas firms listed on the Nigerian Exchange Group (NGX) from 2014 to 2023. Given the capital-intensive nature of the industry, understanding the relationship between debt and equity financing is crucial for optimizing financial performance. The study employs an ex-post facto research design, relying on secondary data sourced from annual financial reports, the NGX database, the Central Bank of Nigeria (CBN), and the National Bureau of Statistics (NBS).

A panel data regression model is used to assess the effect of key capital structure variables—debt-to-equity ratio, debt ratio, equity ratio, and long-term debt to assets ratio—on firm performance, measured through Return on Assets (ROA) and market value. The study applies descriptive statistics, correlation analysis, and panel regression techniques, using the Hausman test to determine the appropriate model (Fixed Effects or Random Effects). Diagnostic tests are also conducted to ensure the validity and reliability of the regression results.

Findings from the study are expected to provide empirical evidence on how leverage influences financial performance, offering insights for corporate managers, investors, and policymakers in optimizing capital structure decisions. The study contributes to existing literature by incorporating Environmental, Social, and Governance (ESG) considerations, which have gained prominence in corporate financing decisions.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background To The Study

The oil and gas sector in Nigeria is one of the country's most crucial economic drivers, accounting for approximately 9.25% of the Gross Domestic Product (GDP) as of 2023, and providing over 70% of foreign exchange earnings and around 50% of government revenue (National Bureau of Statistics, 2023). Despite this significant contribution, the sector frequently faces multiple challenges that affect its stability and overall performance. Global oil price volatility, regulatory changes, limited investment opportunities, and political instability are constant pressures on the Nigerian oil and gas industry, which, in turn, impact firm performance and economic growth (OPEC, 2022; World Bank, 2023).

A key factor influencing the performance and competitiveness of firms in this sector is their capital structure—the blend of debt and equity they employ to fund operations. The choice between debt and equity is particularly crucial in the capital-intensive oil and gas industry, where large amounts of capital are essential to finance exploration, production, and distribution activities (Adeyemi & Oboh, 2022). Capital structure affects not only the cost of capital but also the financial risk, profitability, and ultimately, the market valuation of firms in this sector. Evidence from emerging markets shows that an optimal capital structure can significantly enhance firm performance by reducing the cost of capital and improving financial stability (Singh & Yadav, 2022). Theoretical perspectives,

such as the Modigliani and Miller (M&M) theorem, argue that a firm's value is unaffected by its capital structure in a perfect market (Modigliani & Miller, 1958). However, in real-world conditions, imperfections such as taxes, bankruptcy costs, and asymmetric information mean that capital structure decisions can profoundly impact a firm's value and performance (Jensen & Meckling, 1976). Recent studies support this notion, indicating that a higher leverage ratio may reduce a company's tax obligations but simultaneously increase its risk of financial distress, especially in volatile industries like oil and gas (Myers, 2021). In Nigeria, oil and gas firms frequently rely on debt financing, which constituted around 60% of the total capital structure for listed oil and gas companies in 2023 (Nigerian Stock Exchange, 2023). However, high debt levels expose these firms to financial distress, particularly during periods of low oil prices, as observed in the 2020 oil price crash. This reliance on debt can increase the likelihood of bankruptcy, especially given the high-interest rates and frequent currency devaluation in Nigeria, which further inflates borrowing costs (Olanrewaju & Fadiran, 2021). Comparatively, companies in developed oil-exporting countries, such as Norway and Canada, have shown greater resilience to oil price shocks due to more balanced capital structures and stronger capital markets (OECD, 2023).

Understanding the optimal balance between debt and equity is therefore essential for enhancing firm performance and ensuring financial stability within the Nigerian oil and gas sector. Research shows that companies with well-optimized capital structures are better equipped to manage industry risks, maintain liquidity, and generate shareholder

value over the long term (Oladele & Adebayo, 2022). Achieving this balance is particularly challenging in Nigeria, where macroeconomic instability, high inflation, and foreign exchange scarcity create a risky financial environment. Consequently, an empirical investigation into the capital structure-performance relationship can provide valuable insights for managers, policymakers, and investors seeking to enhance firm stability and performance in Nigeria's oil and gas sector.

## **1.2 Statement of the Problem**

Capital structure decisions are particularly crucial in Nigeria's oil and gas sector, where firms face unique financial challenges and risks. High levels of debt expose companies to financial distress and increased bankruptcy risk, especially in a sector as volatile as oil and gas. Conversely, heavy reliance on equity financing may dilute shareholder control and fall short of meeting the sector's substantial capital demands (Akinlo, 2011). As a result, identifying the ideal mix of debt and equity that enhances firm performance while minimizing financial risk remains a significant challenge for Nigerian oil and gas companies. Several studies have investigated the capital structure-firm performance relationship, with varying results. For instance, Abor (2005) found that, in Ghana, a higher debt ratio positively influenced firm performance, particularly in capital-intensive sectors. However, these findings may not apply to Nigeria's oil and gas sector, given Nigeria's unique economic environment, marked by high-interest rates and currency volatility. In another study, Margaritis and Psillaki (2010) examined the relationship

between capital structure and firm performance in a sample of European firms, concluding that firms with moderate debt levels outperformed those with excessively high or low debt ratios. However, the economic conditions in Europe differ considerably from those in Nigeria, limiting the applicability of these findings to Nigerian oil and gas firms. Additionally, Olayinka (2011) explored capital structure and corporate performance in Nigeria's manufacturing sector, reporting a positive relationship between leverage and performance. However, the capital structure dynamics in manufacturing may not align with those in the oil and gas industry, which requires higher capital investments and is more vulnerable to price fluctuations.

The gap in the existing literature lies in the lack of industry-specific research on the Nigerian oil and gas sector, which faces distinct financial and operational risks. Current studies either generalize findings across multiple industries or draw insights from economies with differing financial environments. This study seeks to address this gap by providing a comprehensive analysis of the impact of capital structure on firm performance specifically in Nigeria's oil and gas sector. By focusing on this industry, the research aims to offer insights into how Nigerian oil and gas companies can optimize their capital structure to enhance performance and mitigate financial risk.

### **1.3 Research Questions**

The study addresses the following research questions:

1. What is the relationship between debt-to-equity ratio and firm performance in Nigeria's oil and gas sector?
2. How does the debt ratio impact the profitability of oil and gas companies in Nigeria?
3. What effect does the equity ratio have on firm value and market performance in the sector?
4. How does long-term debt to total assets ratio influence firm performance in Nigeria's oil and gas sector?

### **1.4 Objectives of the Study**

The main objective of this study is to examine the impact of capital structure on firm performance in Nigeria's oil and gas sector. The specific objectives are to:

1. Investigate the relationship between debt-to-equity ratio and firm performance.
2. Determine the effect of debt ratio on the profitability of oil and gas companies.
3. Assess the impact of equity ratio on firm value and market performance.
4. Examine the influence of long-term debt to total assets ratio on firm performance in the oil and gas sector.

## **1.5 Research Hypotheses**

To guide the study, the following null hypotheses are formulated:

1.H0<sub>1</sub>: There is no significant relationship between debt-to-equity ratio and firm performance in Nigeria's oil and gas sector.

2.H0<sub>2</sub>: Debt ratio does not have a significant impact on the profitability of oil and gas companies.

3.H0<sub>3</sub>: Equity ratio does not significantly affect firm value and market performance.

4.H0<sub>4</sub>: Long-term debt to total assets ratio does not significantly influence firm performance in Nigeria's oil and gas sector.

## **1.6 Scope of the Study**

This study focuses on oil and gas companies listed on the Nigerian Exchange (NGX) from 2014 to 2023. Given the capital-intensive nature of the industry and its critical role in the Nigerian economy, this sector provides a suitable context to explore the relationship between capital structure and firm performance. Performance metrics will include profitability, return on assets (ROA), while capital structure variables will include debt-to-equity ratio, debt ratio, equity ratio, and long-term debt to total assets ratio.

## **1.7 Significance of the Study**

This study is significant for several reasons.

First, it provides practical insights for financial managers in Nigeria's oil and gas sector, offering guidance on capital structure decisions that can enhance profitability and maximize shareholder value. By identifying the optimal debt-to-equity mix specific to this capital-intensive industry, the study supports financial managers in balancing risk and return, especially in the face of high financing costs and volatile oil prices. These insights can assist managers in making strategic decisions that bolster the financial health and competitive positioning of their companies (Adebayo & Akinlabi, 2022).

Second, the study contributes to the broader academic discourse on capital structure and firm performance by addressing the unique conditions of an emerging market like Nigeria. While extensive research exists on this relationship in developed economies, emerging markets often have different financial challenges, such as limited capital access, high-interest rates, and regulatory hurdles (Dare & Sola, 2023). By focusing on Nigeria's oil and gas sector, this study adds to the limited literature on capital structure dynamics in emerging markets, thus filling a critical research gap and offering a basis for comparison across different economic contexts.

The findings may also inform policymakers and regulators, enabling them to establish a supportive regulatory and financial environment for oil and gas firms. Insights from the study could highlight the capital structure challenges specific to this sector, such as the impacts of foreign exchange volatility on debt servicing. Policymakers could use this information to tailor policies that mitigate financing risks, enhance access to affordable

credit, and stabilize the sector's financial framework (World Bank, 2023). Effective policies that promote financial stability in the oil and gas industry not only benefit individual firms but also strengthen Nigeria's broader economic resilience given the sector's critical contribution to GDP and government revenues.

Lastly, this study serves as a foundation for future research by providing empirical data and insights into capital structure dynamics within Nigeria's oil and gas sector. It can help future researchers by establishing a clear understanding of the capital structure-performance relationship in this context, supporting comparative studies across other industries or regional markets. Moreover, by providing a robust methodological framework, this research can guide future empirical investigations that aim to explore how various macroeconomic factors, such as inflation and interest rates, influence capital structure and firm performance in other emerging economies (Olanrewaju & Fadiran, 2021)

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews relevant literature on capital structure and firm performance, focusing on conceptual definitions, theoretical frameworks, empirical studies, and the gap in the existing research, particularly in the context of Nigeria's oil and gas sector.

#### **2.2 Conceptual Review of Capital Structure**

Capital structure refers to the way a company finances its operations and growth through a combination of debt, equity, and other financial instruments. It involves the proportion of debt to equity used by a firm to fund its assets and ensure its day-to-day operations (Brealey, Myers, & Allen, 2020). The composition of a firm's capital structure plays a pivotal role in determining its financial performance, risk, and market value (Mollah & Lipy, 2019). The primary components of capital structure include debt capital and equity capital, each of which carries different implications for a firm's financial health.

Debt capital refers to funds that are borrowed by a firm and must be repaid over time, usually with interest. This includes long-term loans, bonds, and short-term borrowings (Myers, 2001). The use of debt in a company's capital structure provides the firm with the necessary funds for expansion, acquisitions, or operations, without diluting the ownership of existing shareholders (Graham & Harvey, 2001). However, debt also introduces financial risk, as the company is obligated to repay interest and principal,

regardless of its financial performance (Titman & Wessels, 1988). In times of economic distress or declining revenues, high levels of debt may lead to bankruptcy or default risk (Fama & French, 2002).

Equity capital, on the other hand, refers to funds raised through the issuance of shares (common stock, preferred stock) or from retained earnings. It represents ownership in the firm and does not require repayment (Miller & Modigliani, 1961). Equity capital allows firms to raise funds without incurring debt obligations, but it comes with the downside of diluting control among existing shareholders. Furthermore, equity financing may be seen as more costly compared to debt because of higher expected returns for equity holders and the potential loss of ownership control (Harris & Raviv, 1991). The decision regarding how much debt versus equity to use is a critical one for firms, as it can influence the cost of capital, risk level, and financial stability (Modigliani & Miller, 1958). A firm with high leverage (more debt) may benefit from the tax deductibility of interest payments, which lowers the overall cost of capital (Jensen & Meckling, 1976). However, excessive reliance on debt can lead to higher financial risk, potentially affecting the firm's profitability, growth opportunities, and ability to meet financial obligations (Frank & Goyal, 2009).

An optimal capital structure aims to balance the benefits and risks associated with both debt and equity. It enables a firm to minimize its overall cost of capital, maximize its market value, and maintain flexibility in financing future projects (Brealey et al., 2020).

However, achieving this optimal balance is challenging, especially in industries such as oil and gas, where market volatility and capital intensity are prominent features. For instance, oil and gas firms may face significant fluctuations in revenue due to global oil price volatility, regulatory changes, and operational challenges (Ghazali, 2018). Therefore, the capital structure decisions of oil and gas companies are often influenced by external market conditions, such as interest rates, inflation, and oil price trends, as well as internal factors like company size, profitability, and growth prospects (Mollah & Lipy, 2019).

The capital structure of a firm can directly affect its profitability and performance. Debt financing can lead to higher returns on equity if the firm's investments generate returns that exceed the cost of debt. This effect is known as financial leverage (Modigliani & Miller, 1958). On the other hand, too much debt can increase the firm's risk and lead to reduced profitability, as interest payments take precedence over reinvestment or dividends (Chowdhury & Chowdhury, 2020). The profitability of firms with a well-structured mix of debt and equity tends to be higher, as they can capitalize on tax shields while minimizing financial distress costs (Fama & French, 2002). Moreover, a firm's capital structure can influence its growth opportunities. Companies with lower debt levels are typically more flexible in pursuing growth, as they have lower financial obligations and higher levels of retained earnings that can be reinvested into the business (Rajan & Zingales, 1995). In contrast, firms with high debt may find themselves constrained,

especially during periods of economic downturns or when access to new capital markets is limited (Opler et al., 1999).

The use of debt in a company's capital structure can also impact its risk profile. While debt can lower the overall cost of capital, it increases financial risk due to the fixed nature of debt payments (Titman & Wessels, 1988). Financial leverage amplifies both the potential return and the risk. In high-risk sectors such as oil and gas, where the industry is subject to commodity price fluctuations, political instability, and environmental concerns, capital structure decisions are particularly crucial (Brealey et al., 2020). High levels of debt may expose firms to the risk of bankruptcy during periods of negative economic performance, while a conservative capital structure may restrict the firm's ability to expand or take advantage of new market opportunities (Jensen, 1986). In conclusion, the capital structure of a firm is a complex and dynamic concept, influenced by a multitude of internal and external factors. The appropriate balance between debt and equity is essential for maximizing firm performance, profitability, and long-term sustainability. In the Nigerian oil and gas sector, capital structure decisions must account for both global oil price movements and local economic conditions to ensure that firms remain competitive and financially stable (Mollah & Lipy, 2019).

## **2.2 Firm Performance**

Firm performance refers to the financial and operational outcomes of a company, which reflect its ability to generate returns, maintain profitability, and sustain long-term growth.

These outcomes are typically measured using various indicators such as profitability, return on assets (ROA), return on equity (ROE), market share, and stock performance (Kotler & Keller, 2016). In the context of the oil and gas industry, firm performance is influenced by both internal and external factors, including market conditions, operational efficiency, regulatory compliance, and, crucially, the capital structure decisions made by management (Fama & French, 2002). Optimal capital structure decisions—i.e., the right mix of debt and equity financing—are widely believed to lead to superior firm performance by minimizing costs, maximizing returns, and reducing financial risks (Modigliani & Miller, 1958).

The key metrics used to assess firm performance can be classified into several categories, each of which provides insights into different dimensions of a company's financial health and growth prospects:

**Profitability** is a central measure of firm performance, reflecting the company's ability to generate earnings relative to its revenue, assets, or equity. The most commonly used profitability ratios include Return on Assets (ROA), Return on Equity (ROE), and Gross Profit Margin. ROA measures how effectively a firm uses its assets to generate profit, while ROE assesses the profitability relative to shareholders' equity (Liu & Li, 2020). Gross profit margin provides insights into a firm's operational efficiency by evaluating the proportion of revenue remaining after accounting for the cost of goods sold (Goddard

et al., 2005). These ratios are particularly useful for assessing how well a firm is managing its resources and producing profits relative to its size and capital base.

The link between capital structure and firm performance is central to corporate finance theory. The relationship has been extensively explored in both theoretical and empirical research, with many studies suggesting that an optimal capital structure—where a firm balances its debt and equity financing in the right proportions—can lead to superior firm performance. According to the Modigliani-Miller theorem, under perfect market conditions, a company's capital structure does not affect its overall value (Modigliani & Miller, 1958). However, in the real world, factors such as taxes, bankruptcy costs, and market imperfections mean that capital structure decisions do have significant effects on firm performance (Miller, 1977). For instance, financial leverage, which is the use of debt financing to increase the potential return on equity, can magnify both profits and risks (Jensen, 1986). When leveraged appropriately, debt can provide a firm with additional capital for expansion without diluting ownership control. However, excessive reliance on debt can increase financial risk, leading to higher costs of capital, reduced profitability, and even financial distress (Fama & French, 2002). In the oil and gas industry, the capital structure-performance link is particularly pronounced due to the capital-intensive nature of the industry, which requires substantial investments in exploration, drilling, and infrastructure (Aivazian, Ge, & Qiu, 2005). Oil and gas companies typically rely on both debt and equity to fund large-scale projects, and the structure of this financing can have a significant impact on their ability to generate returns and sustain operations in the face of

market volatility. Firms with an optimal capital structure are better positioned to manage fluctuations in oil prices, production costs, and regulatory changes, which in turn can result in superior performance (Ghazali, 2018).

Corporate governance factors, such as the role of management and board structures, can also affect how capital structure decisions are made and how they impact firm performance (Fama & Jensen, 1983). Strong governance practices can ensure that firms make capital structure decisions that align with long-term shareholder value, reducing the likelihood of financial distress and improving overall firm performance. In summary, firm performance is a multifaceted concept that encompasses profitability, market performance, and operational efficiency. It is influenced by a variety of internal and external factors, with capital structure being one of the most significant determinants. The appropriate mix of debt and equity financing can improve profitability and efficiency, while suboptimal capital structure decisions may hinder firm performance and increase financial risk. In the Nigerian oil and gas sector, the volatility of oil prices and the capital-intensive nature of the industry make capital structure decisions especially important for maintaining competitive advantage and financial stability (Ghazali, 2018). The next section will explore the theoretical frameworks that underpin these capital structure-performance relationships.

## **2.3 Theoretical Review**

### **2.3.1 Modigliani-Miller Theorem (1958)**

The Modigliani-Miller (MM) theorem is a foundational concept in corporate finance that asserts, under ideal market conditions, the value of a firm is independent of its capital structure (Modigliani & Miller, 1958). In a world without taxes, bankruptcy costs, transaction costs, or asymmetric information, the MM theorem posits that the method of financing—whether through debt or equity—has no impact on the firm’s value. This is because investors can create their own leverage by borrowing or lending on their personal accounts, making the firm’s capital structure irrelevant.

However, in reality, the presence of market imperfections such as taxes, bankruptcy costs, and asymmetric information necessitates a reassessment of this theorem. For instance, the tax deductibility of interest payments makes debt financing advantageous in practice, as it can lower the firm’s taxable income and increase its overall value (Graham, 2020). Similarly, bankruptcy and financial distress costs, which are ignored in the MM world, represent significant risks to firms, especially those with high levels of debt. Consequently, firms must carefully consider these imperfections when making capital structure decisions, adapting the MM theorem to practical scenarios.

### **2.3.2 Trade-Off Theory**

The Trade-Off Theory, introduced by Kraus and Litzenberger (1973), builds upon the MM theorem by incorporating the costs and benefits of debt financing into the capital structure decision. This theory suggests that firms strive to balance the tax advantages of debt—primarily the tax shield from interest deductibility—against the potential costs of financial distress, including bankruptcy costs and agency conflicts.

According to the Trade-Off Theory, there is an optimal capital structure at which the marginal benefits of additional debt (e.g., tax savings) are equal to the marginal costs (e.g., financial distress and agency costs) (Titman & Wessels, 1988). Firms that operate with excessive debt risk financial instability, while those that rely solely on equity may forgo the tax benefits associated with debt financing. For example, empirical studies have shown that large, profitable firms with stable cash flows tend to use higher levels of debt to maximize tax benefits while mitigating financial distress risks (Frank & Goyal, 2009). This balancing act underscores the central tenet of the Trade-Off Theory: firms must strategically manage their capital structure to optimize value.

### **2.3.3 Pecking Order Theory**

The Pecking Order Theory, proposed by Myers and Majluf (1984), challenges the notion of an optimal capital structure by emphasizing the hierarchical nature of financing decisions. According to this theory, firms prioritize internal financing (retained earnings)

over external sources due to the costs and risks associated with raising external capital. When external financing becomes necessary, firms prefer debt over equity, as issuing equity can signal negative information to the market, potentially diluting shareholder value (Brealey et al., 2020).

This theory is grounded in the concept of information asymmetry, wherein managers have more knowledge about the firm's prospects than external investors. As a result, issuing new equity may lead investors to perceive that the firm is overvalued, causing stock prices to decline. To avoid these signaling effects, firms rely on retained earnings first, followed by debt, and lastly equity (Myers, 2001). The Pecking Order Theory is particularly relevant for firms with limited access to capital markets, as they often face higher costs and risks when seeking external financing (Donaldson, 1961).

#### **2.3.4 Agency Theory**

Agency Theory, developed by Jensen and Meckling (1976), explores the conflicts of interest that arise between a firm's shareholders (owners) and managers (agents). Managers, tasked with running the firm, may not always act in the best interests of shareholders, leading to agency costs. These costs stem from monitoring expenses, bonding costs, and residual loss, which can reduce firm value.

Debt financing is proposed as a mechanism to mitigate agency costs, as the obligations associated with debt repayments impose discipline on managers, compelling them to

focus on profitability and efficiency (Harris & Raviv, 1991). For instance, the regular interest payments required under debt financing create a fixed obligation that reduces free cash flow, thereby limiting the scope for managerial opportunism (Jensen, 1986). However, high levels of debt can also lead to conflicts between equity holders and debt holders, particularly in times of financial distress. Equity holders may favor riskier projects that promise high returns, potentially at the expense of debt holders. This misalignment of interests underscores the need for a balanced approach to capital structure decisions (Stulz, 1990).

### **2.3.5 Market Timing Theory**

Market Timing Theory suggests that firms make capital structure decisions based on prevailing market conditions, rather than adhering to a fixed optimal structure (Baker & Wurgler, 2002). According to this theory, firms issue equity or debt depending on market conditions that favor one over the other. For instance, firms may issue equity when stock prices are high to minimize dilution of existing shareholders or issue debt when interest rates are low to reduce borrowing costs. Empirical evidence supports this theory, showing that firms frequently adjust their financing strategies to exploit favorable market conditions (Huang & Ritter, 2009). This opportunistic approach allows firms to reduce their overall cost of capital, although it may result in a capital structure that deviates from traditional theories like the Trade-Off or Pecking Order theories. Market Timing Theory

underscores the dynamic nature of capital structure decisions, highlighting the importance of external market factors in shaping a firm's financing strategy.

## **2.4 Empirical Reviews**

Ologunde, A., Adebayo, M., & Oladipo, J. (2016) examined the relationship between capital structure and firm performance in Nigeria's oil and gas sector over a ten-year period (2006–2015). Their study focused on 10 listed companies, employing panel data regression as the methodology. The findings revealed that a higher debt-to-equity ratio positively influenced return on assets (ROA) and return on equity (ROE). This outcome was attributed to the ability of debt financing to provide sufficient resources for investment in capital-intensive projects. They suggested that oil and gas firms maintain a balanced capital structure to optimize their financial returns without jeopardizing stability.

Adaramola and Atanda (2015) In their analysis of capital structure and profitability, Adaramola and Atanda explored data from eight listed oil and gas companies between 2005 and 2014. Using correlation and regression techniques, they observed that debt financing enhances financial performance by facilitating investments in productive projects. They proposed that oil and gas companies implement strategies for debt management to ensure long-term sustainability while reaping the benefits of leveraging for growth.

Shuaibu and Abdullahi (2023) conducted a study spanning 2010 to 2020 on 12 oil and gas firms in Nigeria. Using a dynamic panel data estimation technique (GMM), they found that moderate leverage enhances financial performance, while excessive debt increases financial risk and distress. They recommended implementing regulatory policies to encourage firms to maintain optimal leverage levels while discouraging over-reliance on debt financing, which could expose them to financial instability.

Akinleye (2020) analyzed the influence of capital structure on the profitability of 15 oil and gas firms from 2012 to 2018 using a fixed-effects model. His findings highlighted that short-term debt positively affects profitability, while long-term debt produced mixed results, depending on the firm's ability to service it efficiently. He advised firms to align their debt decisions with their operational objectives and financial capacity to ensure sustainable performance.

Ogundipe (2019) investigated the interplay between leverage and performance in nine oil and gas companies over the period 2008–2017. Using panel regression, the study concluded that moderate use of debt improves ROA and ROE but excessive leverage diminishes firm value. The researchers recommended that companies adopt strategic debt management practices to balance financial risk with growth opportunities.

Adebayo and Aderibigbe (2022) studied the effects of capital structure on firm performance between 2010 and 2019. Focusing on 10 listed oil and gas firms, they employed structural equation modeling to uncover that financial performance is

positively linked to the optimal utilization of debt for tax benefits while minimizing distress costs. They recommended that firms focus on leveraging tax shields effectively without exposing themselves to unnecessary financial risk.

Fasina and Ayodele (2021) explored the influence of capital structure consistency on firm outcomes using data from seven Nigerian oil and gas companies between 2011 and 2020. They used descriptive and inferential statistics to show that firms with stable capital structures outperform those that frequently restructure their finances. They suggested that firms establish long-term financial strategies and avoid unnecessary shifts in their financing mix to sustain growth.

Eze (2022) conducted a study covering 2012 to 2021 on six listed oil companies in Nigeria. He applied pooled ordinary least squares (OLS) and random-effects models to analyze the relationship between equity financing and firm growth. The study revealed a positive relationship between equity financing and long-term growth, while excessive debt had a negative effect on operational efficiency. The researcher advised firms to prioritize equity financing for projects requiring long-term funding.

Adekunle and Salawu (2018) investigated the relationship between capital structure and firm performance from 2009 to 2017, using data from 10 oil and gas firms. Adopting a two-step GMM approach, they demonstrated a non-linear relationship between leverage and firm value, highlighting the existence of an optimal leverage point. They

recommended that firms aim for this optimal leverage level to maximize value without incurring excessive financial costs.

Idowu (2023) analyzed the relationship between debt capital and firm performance in eight listed oil and gas firms from 2013 to 2022. Employing multi-variable regression analysis, he found that while debt financing boosts market share, it negatively impacts profitability when overused. The study recommended diversification of financing sources to mitigate risks associated with over-reliance on debt and enhance both profitability and competitiveness.

Ologunde (2016) conducted a study to examine the relationship between capital structure and firm performance in Nigeria's oil and gas sector from 2006 to 2015. Using panel data regression, the research analyzed 10 listed firms. The findings revealed that a higher debt-to-equity ratio positively influenced ROA and ROE, as debt financing provided sufficient resources for capital-intensive projects. The study suggested that oil and gas firms maintain a balanced capital structure to optimize financial returns while preserving financial stability.

Akinlo and Akinlo (2012) explored how leverage affects firm performance among 15 oil and gas companies in Nigeria between 2000 and 2010. Employing ordinary least squares (OLS) regression, the study discovered a significant positive relationship between leverage and performance, highlighting that debt financing played a critical role

in boosting profitability. The authors recommended a prudent approach to leveraging, ensuring firms avoid excessive debt to maintain financial health.

Bamidele (2015) investigated the impact of capital structure on the performance of 12 listed oil and gas firms in Nigeria over the period 2005 to 2014. Using a fixed effects model, the study found that moderate levels of debt financing positively influenced firm performance, with over-leveraged firms experiencing diminishing returns. The research emphasized the importance of maintaining an optimal capital structure to enhance profitability and minimize financial distress.

Olawale and Adeyemi (2017) examined the relationship between capital structure and firm performance using data from eight Nigerian oil and gas firms over a 12-year period (2004–2016). Applying dynamic panel data analysis, the study found a significant positive effect of debt financing on performance indicators such as ROE and ROA. It was recommended that firms strategically utilize debt financing while carefully managing debt levels to avoid excessive financial risks.

Chinedu and Olagunju (2019) analyzed the impact of capital structure on firm performance in the Nigerian oil and gas sector between 2010 and 2018. Data from nine listed companies were examined using multiple regression analysis. The results showed that while debt financing improved performance in the short term, excessive reliance on debt led to negative outcomes in the long term due to financial risks. The study advised

firms to adopt a conservative approach to debt management by balancing it with equity financing.

Olayemi and Balogun (2014) investigated how capital structure decisions influenced financial performance among 14 oil and gas companies in Nigeria from 2003 to 2013. The study employed a pooled OLS model and found that leverage significantly impacted firm performance, with higher debt levels correlating with improved profitability. The authors suggested that firms prioritize long-term debt over short-term debt to mitigate risks associated with liquidity constraints.

Musa and Ibrahim (2018) assessed the relationship between capital structure and firm performance using data from 11 oil and gas firms in Nigeria for the period 2008 to 2017. Employing a random effects model, the findings indicated that debt financing positively influenced ROE and ROA. The study recommended that firms carefully evaluate their capital structure to ensure a balance that maximizes returns without exposing them to excessive risks.

Adebayo and Omolayo (2020) examined how leverage impacted firm performance in the oil and gas sector in Nigeria, analyzing 13 listed firms over the period 2009 to 2018. Using a generalized method of moments (GMM) approach, the study revealed a significant positive relationship between debt levels and performance. The authors emphasized the need for firms to monitor their debt ratios to maintain financial sustainability and profitability.

Johnson and Adeola (2015) explored the effect of capital structure on the financial performance of 10 oil and gas firms in Nigeria between 2007 and 2014. The study applied a fixed effects model and found that moderate levels of leverage enhanced firm performance, while excessive debt levels hindered profitability. It was suggested that firms adopt strategic financing decisions to optimize their capital structure for improved performance.

Okoro and Amadi (2021) investigated the influence of capital structure on firm performance in the Nigerian oil and gas sector over a 10-year period (2010–2020). Using data from 12 listed companies and a panel regression model, the study concluded that debt financing significantly contributed to better performance metrics, including ROA and ROE. The researchers recommended a balanced capital structure that leverages debt without jeopardizing financial stability.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

The chapter provides a systematic framework for conducting the study, covering the research design, population and sampling techniques, data sources, model specification, and data analysis methods. By employing a panel data regression model, the study aims to establish the impact of capital structure on firm performance while ensuring accuracy, transparency, and validity through statistical and diagnostic tests.

#### **3.2 Research Design**

The study adopts an ex-post facto research design, utilizing secondary data to explore the impact of capital structure on firm performance. This approach is suitable because it examines historical data without manipulation, allowing for robust analysis of the relationships among the variables.

#### **3.3 Population of the Study**

The population for this study comprises all firms listed on the Nigerian Exchange Group (NGX). As of 2023, several companies are publicly traded, but the focus is on oil and gas firms that actively disclose ESG (Environmental, Social, and Governance) data in their

annual reports. These companies are selected due to their transparency and relevance to examining capital structure's impact on financial performance.

### **3.4 Sample Size and Sampling Technique**

The sample includes oil and gas firms listed on the NGX that have consistently disclosed ESG information in their financial statements from 2014 to 2023. Purposive sampling was used to ensure the inclusion of companies with substantial and reliable data. The selected companies are:

- 1. Aradel Holdings Plc**
- 2. Capital Oil Plc**
- 3. Conoil Plc**
- 4. Eterna Plc**
- 5. Japaul Gold & Ventures Plc**
- 6. MRS Oil Nigeria Plc**
- 7. Oando Plc**
- 8. Seplat Energy Plc**

## **9. Total Energies Marketing Nigeria Plc**

### **3.5 Data Sources and Collection Methods**

The study relies exclusively on secondary data obtained from various reputable sources. Key financial information is sourced from the annual reports and financial statements of the sampled firms, providing insights into their performance, profitability, and governance structures. Additionally, data is collected from the Nigerian Exchange Group (NGX) database, which serves as a central repository for market-related financial disclosures and stock performance indicators. To complement firm-level data, relevant macroeconomic variables are gathered from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS), ensuring a comprehensive analysis that considers broader economic factors influencing corporate performance.

### **3.6 Model Specification**

This study adopts the panel data regression model used in prior empirical research on capital structure and firm performance, particularly drawing from the work of Modigliani and Miller (1958) and Jensen and Meckling (1976) on capital structure theories. The model is specified as follows:

$$FP_{it} = \beta_0 + \beta_1 DER_{it} + \beta_2 DR_{it} + \beta_3 ER_{it} + \beta_4 LTDTA_{it} + \epsilon$$

Where:

$FP_{it}$ : Firm performance (measured by ROA) for firm.

$DER_{it}$ : Debt-to-equity ratio for firm.

$DR_{it}$ : Debt ratio for firm.

$ER_{it}$ : Equity ratio for firm.

$LTD_{it}$ : Long-term debt to total assets ratio for firm.

$\beta_0$ : Constant term.

$\beta_1, \beta_2, \beta_3, \beta_4$ : Coefficients of the independent variables.

$\epsilon_i$ : Error term.

### 3.7 Operationalization of Variable

<b>Variable</b>	<b>Type</b>	<b>Measurement</b>	<b>Expected Impact</b>
Debt-to-Equity Ratio	Independent	Total Debt / Total Equity	Negative
Debt Ratio	Independent	Total Debt / Total Assets	Negative
Equity Ratio	Independent	Total Equity / Total Assets	Positive
Long-Term Debt to Assets	Independent	Long-term Debt / Total Assets	Negative
Firm Performance (ROA)	Dependent	EBIT / Total Assets	N/A
Firm Performance (Market Value)	Dependent	Share price × Outstanding shares	N/A

### **3.8 Data Analysis Techniques**

The following analytical techniques will be employed:

- 1. Descriptive Statistics** to summarize the data's central tendencies and dispersion.
- 2. Correlation Analysis** to identify the strength and direction of relationships among variables.
- 3. Panel Data Regression Analysis** to examine the impact of capital structure on firm performance, using Fixed Effects or Random Effects models as determined by the Hausman test.
- 4. Diagnostic Tests** to ensure the reliability and validity of the regression results, including tests for multicollinearity, heteroskedasticity, and serial correlation.

## **CHAPTER FOUR**

### **EMPIRICAL ANALYSIS**

#### **4.1 INTRODUCTION**

This chapter presents the results, analysis and interpretation of the panel data collected for the purpose of testing the models developed in this study. The set of analysis in this study comprises analyses to determine the impact of capital structure on the oil and gas firms in Nigeria. The analysis therefore involves the use of econometric methods in order to provide a rich background for the investigation. The econometric analysis extends the statistical analysis with the goal of performing the empirical analysis and obtaining estimated coefficients which are valid enough to test the hypotheses in the study. As explained in the previous chapter, the Panel Data Analysis method is employed in the econometric analysis.

#### **4.2 EMPIRICAL TESTS AND RESULTS BASED ON PANEL DATA ANALYSIS**

In this section, the results of the panel data estimates of the models specified in the previous chapter are reported and analysed. The focus of the analysis is actually on the goodness of fit statistics as well as the coefficients' results which will help provide the basis for the tests of hypotheses in the study. The series estimates the relationship between capital structure and oil and gas performance in Nigeria. The panel data estimation strategy adopted in this section presupposes that the biases in the pooled data could either come from cross sectional heterogeneity or time series (periodic) variations.

Hence, the Hausman test of heterogeneity is initially conducted to determine the best effects model (random or fixed) to be adopted in the analysis. The result of the Hausman test is reported in Table 4.1 below. The Chi-square statistic value for the equations is not significant. From these results, if the p-value is significant the fixed effect model should be used but if the p-value is not significant the random effect model is employed. Hence, the best method to apply is the random effect model.

**Table 4.1: Hausman Test for Effects**

<i>Test Summary</i>		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
<i>Cross-section random</i>		6.2308	5	0.2844
<i>Variable</i>	<i>Fixed</i>	<i>Random</i>	<i>Var(Diff.)</i>	<i>Prob.</i>
DETA	1.8269	-0.5669	6.2148	0.3369
DTE	-46.5367	-41.6461	21.7476	0.2943
EQTAS	-2.4276	-3.4179	0.9667	0.3138
LTDTA	-4.9852	-2.7976	3.5876	0.2481
LTDTE	59.4808	50.8346	97.6753	0.3817

#### **4.2.1 Capital Structure and Performance of Oil and Gas Performance**

The result of the impact of capital structure on the performance of oil and gas variables such as

Return on equity (ROE), debt to total asset (DETA), debt to equity (DTE), equity to total assets (EQTAS), long term debt to total assets (LTDTA), and long term debt to equity (LTDTE) were reported in Table 4.2 below. The adjusted R squared value of 0.9383 indicates that over 93 percent of the systematic variations in the performance of oil and

gas in Nigeria are explained by the explanatory variables. The F value of 210.8 is also high and easily passes the significance test at the 1 percent level. This shows the hypothesis of a significant relationship between financial performance and all the independent variables combined is significant.

The particular impact of each of the explanatory variables on financial performance is determined by considering the individual coefficients of the explanatory variables in terms of signs and significance. In the results reported, all the coefficients are negatively signed except for LTDTE which is positive.

The coefficient of debt to equity is negative and significant at the 1 percent level. This shows that financial performance decreases as the number of debt to equity increases. This is in line with economic theory. Debt is key to the performance of oil and gas in Nigeria. However, incessant increase in debt could lead to dilution.

The coefficient of DETA, EQTAS, LTDTA and LTDTE are not significant at the 5 percent level. This show that all these variables do not have any impact on the performance of oil and gas in Nigeria.

**Table 4.2: Impact of Capital Structure on Deposit Money Banks' Performance**

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>	<i>Prob.</i>
<i>C</i>	286.3694	0.8112	0.4203
<i>DETA</i>	-0.5669	-0.1368	0.8916
<i>DTE</i>	-41.6461	-3.9857	0.0002
<i>EQTAS</i>	-3.4179	-1.1106	0.2711
<i>LTDTA</i>	-2.7976	-1.5057	0.1371
<i>LTDTE`</i>	50.8346	1.8922	0.0630
<i>R-squared</i>	0.9428	<i>F-statistic</i>	210.8155 (0.0000)
<i>Adjusted R-squared</i>	0.9383	<i>D.W</i>	2.1319

Source: Eview 10 output 2025

### 4.3. Test of Hypotheses

The results obtained from the previous section are useful for conducting statistical testing of the hypotheses of the study. They also generate strong issues for discussion. In testing the hypotheses, focus is on the statistical significance of the relevant variables examined in the empirical analysis.

#### Hypothesis One

*Debt to total asset has no significant impact on the financial performance of oil and gas in Nigeria.* The result obtained from the estimate showed that the DETA is negative but

not significant. Based on the t-test of significance for the variable, the t-value was not significant at the 5 percent level. Thus, we fail to reject the null hypothesis.

### **Hypothesis Two**

*Debt to equity has no significant impact on the financial performance of oil and gas in Nigeria.* The result obtained from the estimate showed that the DTE is negative and significant. Based on the t-test of significance for the variable, the t-value is significant at the 1 percent level. Thus, we reject the null hypothesis.

### **Hypothesis Three**

*Equity to total asset has no significant impact on the financial performance of oil and gas in Nigeria.* The result obtained from the estimate showed that the EQTA is negative but not significant. Based on the t-test of significance for the variable, the t-value was not significant at the 5 percent level. Thus, we fail to reject the null hypothesis.

### **Hypothesis Four**

*Long term debt to total asset has no significant impact on the financial performance of oil and gas in Nigeria.* The result obtained from the estimate showed that LTDTA is negative and not significant. Based on the t-test of significance for the variable, the t-value was not significant at the 5 percent level. Thus, we fail to reject the null hypothesis.

### **Hypothesis Five**

*Long term debt to total equity has no significant impact on the financial performance of oil and gas in Nigeria.* The result obtained from the estimate showed that LTDTE is positive and not significant. Based on the t-test of significance for the variable, the t-value is not significant at the 5 percent level. Thus, we fail to reject the null hypothesis.

### **4.4. Discussion of Findings**

The result of the regression shows that debt to equity is negatively significant. Debt is important to the growth of a firm. However, there should be a balance between equity and debt. An incessant increase in debt reduces the control of equity holders as well as lead to dilution. The result showed that only equity to debt is significant in the oil and gas sector in Nigeria.

The other variables were not significant to the performance of the oil and gas sector in Nigeria.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

#### 5.1 SUMMARY OF FINDINGS

This study focuses on empirically estimating the relationship between capital structure and financial performance of oil and gas in Nigeria. Seven (7) quoted oil and gas firm were used in this study.

Six variables such as; return on equity (ROE), debt to total asset (DETA), debt to equity (DTE), equity to total assets (EQTAS), long term debt to total assets (LTDTA), and long term debt to equity (LTDTE) were used for the estimation. The data used ranges from 2014 to 2023 across 7 oil and gas firms in Nigeria. And the number of observation is (7 deposit oil and gas times 10 years) 70. This study used the panel regression technique. This implies that the 70 observations are pooled together before the regression is run, thus neglecting the time series nature and cross sectional nature of the data.

The Ordinary Least squares estimations were employed in the estimation of the models. Results from the empirical analysis show that there is significant relationship between capital structure variables and financial performance of oil and gas firms. Specifically, the following findings were made:

That DETA does not have any impact on the performance of oil and gas firms in Nigeria.

That DTE has a negative impact on the performance of oil and gas firms in Nigeria.

That EQTA does not have any impact on the performance of oil and gas firms in Nigeria.

That LTDTA does not have any impact on the performance of oil and gas firms in Nigeria.

That LTDTE does not any impact on the performance of oil and gas firms in Nigeria.

## **5.2 RECOMMENDATIONS**

Following the findings from this study the following recommendations are made:

That the top management of oil and gas firm should maintain an adequate capital structure in order to sustain it performance.

That oil and gas firm's debt profile should be minimal to reduce equity holders' dilution.

## **5.3 CONCLUSION**

This study shows that the sources of long term finance in the oil and gas sector is key to it sustained growth and profitability. And current data from 2014 to 2023 were used to examine the performance of oil and gas sector in Nigeria. The study showed that capital structure has effect on the performance of oil and gas sector in Nigeria.

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# APPENDIX

## Regression Results

Dependent Variable: ROE				
Method: Panel Least Squares				
Date: 03/10/25 Time: 08:35				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 7				
Total panel (balanced) observations: 70				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	133.1675	391.9991	0.339714	0.7353
DETA	1.826972	4.836391	0.377755	0.7070
DTE	-46.53677	11.44241	-4.067043	0.0001
EQTAS	-2.427684	3.232279	-0.751075	0.4556
LTDTA	-4.985231	2.653293	-1.878885	0.0653
LTDTE	59.48080	28.62544	2.077900	0.0422
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.948799	Mean dependent var		-82.09800
Adjusted R-squared	0.939088	S.D. dependent var		494.6931
S.E. of regression	122.0916	Akaike info criterion		12.60223
Sum squared resid	864568.8	Schwarz criterion		12.98768
Log likelihood	-429.0779	Hannan-Quinn criter.		12.75533
F-statistic	97.70813	Durbin-Watson stat		2.143955
Prob(F-statistic)	0.000000			

Dependent Variable: ROE				
Method: Panel EGLS (Cross-section random effects)				
Date: 03/10/25 Time: 08:36				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 7				
Total panel (balanced) observations: 70				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	286.3694	353.0253	0.811187	0.4203
DETA	-0.566943	4.144375	-0.136798	0.8916
DTE	-41.64613	10.44898	-3.985666	0.0002
EQTAS	-3.417988	3.079108	-1.110058	0.2711
LTDTA	-2.797566	1.858045	-1.505651	0.1371
LTDTE	50.83459	26.86523	1.892208	0.0630
Effects Specification				
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			122.0916	1.0000
Weighted Statistics				
R-squared	0.942759	Mean dependent var		-82.09800
Adjusted R-squared	0.938287	S.D. dependent var		494.6931
S.E. of regression	122.8922	Sum squared resid		966560.1
F-statistic	210.8155	Durbin-Watson stat		2.131967
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.942759	Mean dependent var		-82.09800
Sum squared resid	966560.1	Durbin-Watson stat		2.131967

Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary				
		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		6.230757	5	0.2844
** WARNING: estimated cross-section random effects variance is zero.				
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
DETA	1.826972	-0.566943	6.214841	0.3369
DTE	-46.536774	-41.646126	21.747625	0.2943
EQTAS	-2.427684	-3.417988	0.966718	0.3138
LTDTA	-4.985231	-2.797566	3.587632	0.2481
LTDTE	59.480805	50.834592	97.675277	0.3817
Cross-section random effects test equation:				
Dependent Variable: ROE				
Method: Panel Least Squares				
Date: 03/10/25 Time: 08:37				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 7				
Total panel (balanced) observations: 70				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	133.1675	391.9991	0.339714	0.7353
DETA	1.826972	4.836391	0.377755	0.7070
DTE	-46.53677	11.44241	-4.067043	0.0001
EQTAS	-2.427684	3.232279	-0.751075	0.4556
LTDTA	-4.985231	2.653293	-1.878885	0.0653
LTDTE	59.48080	28.62544	2.077900	0.0422
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.948799	Mean dependent var	-82.09800	
Adjusted R-squared	0.939088	S.D. dependent var	494.6931	
S.E. of regression	122.0916	Akaike info criterion	12.60223	
Sum squared resid	864568.8	Schwarz criterion	12.98768	

Log likelihood	-429.0779	Hannan-Quinn criter.	12.75533
F-statistic	97.70813	Durbin-Watson stat	2.143955
Prob(F-statistic)	0.000000		