

**DETERMINANTS OF FISCAL SUSTAINABILITY IN NIGERIA**

**BY**

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**DEPARTMENT OF ECONOMICS**

**FACULTY OF SOCIAL SCIENCES**

**UNIVERSITY OF BENIN**

**OCTOBER 2025**

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF**

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## CERTIFICATION

This is to certify that this work titled “**Determinants of Fiscal Sustainability in Nigeria**” was carried out by **Favour Ejiro Panama** with matriculation number **SSC2105616** for the award of Bachelor of science (B.Sc) Degree in the department of Economics, Faculty of social science, University of Benin, Benini City, under the supervision of the following persons;

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## **DEDICATION**

This project is dedicated to God Almighty for His infinite grace, mercy and guardianship throughout my academic journey. His divine favour has sustained me through moments of doubts, challenges, and uncertainty, granting me strength and wisdom beyond my understanding. I also dedicate this work to the cherished memory of my late father, a man who loved learning and dreamed that all his children would be educated. Though he is gone, his love remains the light that guides me.

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## ABSTRACT

This study examined the determinants of fiscal sustainability in Nigeria from 1990 to 2023. The research motivation stemmed from Nigeria's ongoing increase in debt levels despite periods of significant oil revenue. Annual time-series data were evaluated using the Autoregressive Distributed Lag (ARDL) bounds testing method, which is suitable when dealing with variables that are integrated at mixed orders,  $I(0)$  and  $I(1)$ . Descriptive analysis revealed notable volatility in oil revenue and inflation, highlighting the erratic nature of Nigeria's macroeconomic landscape. Unit root tests confirmed that the variables exhibited a combination of integration orders, while the bounds test verified a long-term equilibrium relationship. Over the long term, oil revenue and economic growth had significant negative impacts on the debt-to-GDP ratio, suggesting that increase in oil revenue and economic output help alleviate the country's debt burden. The interest rate, although negative, had a less straightforward effect on debt, while inflation displayed a weak and marginal influence. Short-term dynamics from the Error Correction Model (ECM) indicated that deviations from equilibrium are quickly corrected, with approximately 77 percent of disequilibrium addressed within one period. Diagnostic tests indicated no presence of serial correlation or heteroskedasticity, implying that the model is well-structured and dependable. The study concludes that effective management of oil revenue and steady economic growth play a crucial role in Nigeria's debt sustainability. It thus recommends the implementation of sound fiscal policies, diversification of the economy beyond oil, and careful allocation of borrowed resources to ensure long-term macroeconomic stability and sustainable public debt management.

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## CHAPTER ONE

### 1.1 Background of the Study

Fiscal sustainability serves as a crucial measure for evaluating the long-term viability of a nation's public financial system. It denotes the government's capacity to uphold its existing fiscal policies—spending, taxation, and borrowing without resulting in excessive debt, insolvency, or unfair burdens on future generations (Ekpo, 2023). In simple terms, a government that is fiscally sustainable is able to fulfill its current and future duties without having to make drastic adjustments or jeopardize economic stability. It involves the government maintaining a stable fiscal position over an extended period without threatening economic stability or imposing significant debts on future generations.

In Nigeria, the issue of fiscal sustainability has become increasingly urgent due to ongoing budget deficits, escalating debt levels, and fluctuating revenue sources. The nation's fiscal structure is heavily dependent on oil, which constitutes over 70% of government revenue and more than 80% of foreign exchange earnings (Ezechukwu, 2024). This dependency places Nigeria at risk of global oil price fluctuations, which frequently lead to revenue shortfalls, heightened borrowing, and fiscal instability.

One common metric used to gauge fiscal sustainability is the debt-to-GDP ratio, which assesses the size of a nation's debt in relation to its economic output. Nigeria's debt-to-GDP ratio increased from 22.47% in 2021 to 52.3% in 2024, exceeding the country's own sustainability threshold of 40% (Esu, 2024). This rising trend indicates an escalating fiscal imbalance and prompts inquiries into the structural and macroeconomic factors that contribute to debt growth.

Nonetheless, evaluating fiscal sustainability cannot rely solely on debt indicators. It is shaped by the intricate interaction of fiscal behavior (revenue, expenditure, debt servicing), macroeconomic factors (inflation, interest rates, exchange rates), and structural elements like oil price sensitivity.

According to Saibu (2018), Fiscal sustainability is not a static condition it is a dynamic process shaped by economic shocks, policy responses, and institutional capacity. Nigeria's macroeconomic environment has further complicated fiscal management. Inflation surged to 34.69% by mid-2024, interest rates climbed to 29.49%, and the naira depreciated to ₦1,492.9 per dollar, intensifying the cost of debt servicing, especially for foreign-denominated loans. These conditions erode fiscal space and limit the government's ability to invest in growth-enhancing sectors.

Structural volatility in oil prices remains a major threat to Nigeria's fiscal sustainability.

Augustine Jacob (2023) notes that oil price shocks exert asymmetric effects on fiscal outcomes i.e declines in oil prices have a larger negative impact than increases. This underscores the need for fiscal buffers, diversification strategies, and institutional reforms to mitigate external shocks. In response, the Tinubu administration has launched tax reforms aimed at improving Nigeria's tax-to-GDP ratio, which stood at 10.8% in 2022, far below the African average of 16%. These reforms are expected to generate an additional \$7.5 billion annually, reducing reliance on deficit financing and enhancing fiscal resilience (FSDH, 2025).

Despite these efforts, Nigeria's fiscal sustainability remains fragile. The country faces a development financing gap of \$31.5 billion annually, with debt servicing consuming more than the combined budgets for education, health, and infrastructure. This situation demands a comprehensive empirical investigation into the determinants of fiscal sustainability. As Esu

(2024) concludes, “The path to fiscal sustainability in Nigeria lies not in austerity, but in strategic reform, institutional strengthening, and economic diversification.” This study is a step toward illuminating that path.

## **1.2 Statement of the Problem**

Nigeria's rising debt-to-GDP ratio has become a significant issue for fiscal sustainability, increasing from 17.6% in 2010 to 35.1% in 2020 (DMO, 2021). It is crucial to understand the macroeconomic and structural factors contributing to this rise for the purpose of formulating effective fiscal and debt management policies. This research examines the impact of four chosen independent variables—oil revenue, inflation rate, interest rate, and real GDP growth rate on Nigeria's debt dynamics.

Oil revenue continues to be Nigeria's main source of government financing, accounting for over 70% of total revenue for most of the past decade. However, the unpredictability of revenue has been affected by fluctuating global oil prices. The Resource Curse Hypothesis (Auty, 1993) posits that nations dependent on commodity exports often face reduced institutional progression and fiscal instability. This theory is evidenced in Nigeria's fiscal behavior from 2014 to 2016, when a drastic decline in oil prices resulted in significant revenue shortfalls and an increase in borrowing. Consequently, the volatility of oil revenue directly impacts debt accumulation, corroborating Auty's theory in the context of Nigeria.

Moreover, the inflation rate between 2010 and 2020 varied widely, averaging 12.4%, with spikes during economic crises such as the 2016 recession and the COVID-19 pandemic in 2020. The Fiscal Theory of the Price Level (Sargent & Wallace, 1981) contends that inflation emerges from

unmanageable fiscal strategies and deficit financing. In the scenario of Nigeria, inflation failed to alleviate the debt burden through real erosion; instead, it exacerbated the debt-to-GDP ratio because of heightened interest rates, increased debt servicing, and the depreciation of the naira. This situation partially challenges the theory's long-term balancing assumption and illustrates the distortionary effects of supply-driven inflation in an economically fragile structure.

Additionally, during the review period, interest rates—particularly on public debt—experienced significant increases. For example, the Average Treasury Bill rate surged to 13.5% in 2020, elevating the cost associated with domestic borrowing. According to the Loanable Funds Theory (Ohlin, 1937), higher interest rates displace private investment and inflate public debt burdens. This concept is applicable in Nigeria, where high rates not only hindered growth-promoting private investment but also escalated debt servicing costs, further increasing the debt-to-GDP ratio.

Nigeria's situation illustrates this dynamic, as growth stagnation during high debt periods highlights the detrimental cycle of debt overhang, confirming the theory in the short to medium term. Diminished output undermines the country's ability to effectively generate revenue and manage debt servicing, thereby deteriorating the fiscal balance.

In light of the aforementioned points, this study intends to empirically assess how oil revenue, inflation rate, and interest rate influence Nigeria's debt-to-GDP ratio. By grounding each variable in theoretical frameworks and national context, the research offers a comprehensive analytical basis for understanding Nigeria's challenges regarding debt sustainability and for pinpointing focused policy responses.

Thus, this study aims to explore the effects of essential fiscal and macroeconomic indicators on Nigeria's debt-to-GDP ratio by posing the following questions: How does oil revenue influence the nation's debt trajectory? In what ways does government spending affect changes in public debt levels? What correlation exists between inflation and Nigeria's debt-to-GDP ratio, and how does the interest rate influence the country's ability to service its debt? To what degree does the GDP growth rate impact fiscal sustainability in Nigeria, and which of these variables has the most statistically significant effect on the debt-to-GDP ratio?

### **1.3 Objectives of the Study**

The broad objective of the study is to investigate the determinants of fiscal sustainability in Nigeria. Specifically, the study seeks to:

1. examine the effect of oil revenue on Nigeria's debt-to-GDP ratio,
2. investigate the relationship between inflation rate and debt-to-GDP ratio.
3. evaluate the impact of interest rate on Nigeria's debt-to-GDP ratio.

### **1.4 Research Hypotheses**

1.  $H_0$ : Oil revenue has no significant effect on Nigeria's debt-to-GDP ratio.
2.  $H_0$ : Inflation rate has no significant relationship with Nigeria's debt-to-GDP ratio, and
3.  $H_0$ : Interest rate does not significantly affect Nigeria's debt-to-GDP ratio.

## 1.5 Significance of the Study

This study holds substantial academic, policy-oriented, and developmental significance as Nigeria continues its quest for fiscal sustainability. Amidst a period where Nigeria's debt-to-GDP ratio has skyrocketed from 22.47% in 2021 to 52.3% in 2024, it's imperative to understand the main factors contributing to this increase. By pinpointing the fiscal, macroeconomic, and structural elements driving public debt, this study provides important insights for reforming Nigeria's fiscal framework and achieving long-term financial viability.

From an academic standpoint, this research enriches the existing literature on fiscal sustainability by combining variables that are frequently examined in isolation. Contrary to earlier studies that have predominantly concentrated on deficit levels or debt amounts, this research presents a more comprehensive framework that encompasses oil revenue, inflation, interest rates, and real GDP growth—each of which impacts the debt-to-GDP ratio in unique ways. By doing so, the study addresses a significant gap in fiscal modeling specific to the Nigerian context.

At the policy level, the study's results can assist the Ministry of Finance, the Debt Management Office (DMO), the Central Bank of Nigeria (CBN), and state governments in formulating data-driven fiscal and debt strategies. By establishing which factors have the most substantial impact on public debt growth, policymakers can improve forecasting of debt pathways, detect early warning signs, and focus on effective measures. For instance, a clearer understanding of how fluctuations in oil revenue influence debt sustainability can help foster more effective counter-cyclical fiscal policies and facilitate the establishment of stabilization funds.

For development planners, this research provides a forward-thinking approach to managing Nigeria's borrowing decisions in relation to broader macroeconomic objectives—such as poverty

alleviation, job creation, and infrastructure development. Given that high debt servicing costs impede social expenditures, this study emphasizes the trade-offs associated with uncontrolled debt expansion and underscores the importance of balancing borrowing with fiscal stability.

Additionally, the research is particularly pertinent for financial analysts, academics, investors, and international development partners who seek contextual understanding of Nigeria's fiscal landscape. The empirical evidence presented will enhance the precision of sovereign risk evaluations and debt sustainability appraisals, particularly in light of recent global economic disturbances and increasing interest rates in the international capital markets.

Ultimately, this study is poised to aid future scholars by offering a replicable and adaptable model for evaluating debt sustainability in other emerging markets, especially those reliant on commodity-based revenue and susceptible to external volatility.

In conclusion, this research is not only timely but also essential. It brings substance, clarity, and analytical depth to the discourse surrounding Nigeria's fiscal situation, particularly at a moment when the country needs it most.

## **1.6 Scope of the Study**

This study investigates the effect of oil revenue, inflation rate, and interest rate on Nigeria's debt-to-GDP ratio, using annual time-series data spanning 1990 to 2023. The analysis is restricted to Nigeria and applies econometric methods suited for macroeconomic modeling. Only variables with consistent and credible data are included to ensure reliable outcomes.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Conceptual Literature Review**

##### **2.1.1 Fiscal Sustainability**

Fiscal sustainability refers to a government's capacity to manage its spending and revenue over the long term without jeopardizing its solvency, (Adeyemi and Odetayo 2017). Sustainable fiscal policy arises when a government's budget can be financed smoothly without causing a dramatic rise in public debt over time (Sharma and Jaddy, 2009; Adeyemi and Odetayo, 2017). According

to Collingnon (2012), fiscal policies are deemed sustainable when a nation can service its debt without requiring an unrealistic adjustment to the balance of revenues and expenditures in the future, avoiding excessive debt monetization, and being able to endure a reasonable level of external shocks without entering into debt distress.

Governments utilize fiscal policy as an option for promoting both internal and external economic stability (Dandan 2011). Developing nations are particularly vulnerable to cyclical fluctuations, primarily because they export basic commodities and import manufactured and capital goods. However, to mitigate the impacts of international cyclical fluctuations, fiscal policy is employed to connect balanced growth and lessen the effects of cyclical variations through fiscal deficits (Cletus, Ejima and Ali 2021).

Fiscal sustainability can be understood as examining the effects of fiscal policies on public debt to guarantee its durability. Indicators of fiscal sustainability, such as the debt-to-GDP ratio, debt servicing costs, and public expenditure tests, seek to address questions like whether the current fiscal policy trajectory can be maintained without an explosive increase in debt or if the government will have to implement significant tax hikes, reduce spending, resort to monetization, or repudiation. It is the ongoing deficits that make debt a key component of fiscal policy, leading to its occasional reference as debt sustainability (Omoruyi, 2016; Nigel and Hemming, 2000).

Fiscal sustainability is a complex concept. It entails assessing a government's capability to fulfill its long-term financial commitments (solvency), foster stable economic growth, uphold consistent tax policies, and ensure equity between current and future generations. This concept

carries substantial financial, social, and political consequences (OECD, 2009). However, as Alvarado et al. (2004) note, the term is frequently employed without a specific definition. One prevalent approach compares government finances to household budgets, defining policies as sustainable if they adhere to the government's budget constraint. Mendoza and Oviedo (2003) criticize this view as vague, asserting that the budget constraint is fundamentally an accounting identity that is always technically satisfied.

Buiter (1985) presents a broader viewpoint, characterizing fiscal sustainability as the identification of a fiscal pathway that enables a nation to achieve its desired objectives for its citizens. This fundamentally necessitates ensuring the government's long-term solvency as a prerequisite for fulfilling collective societal goals. Therefore, viable fiscal policies must operate within the framework of an intertemporal budget constraint, meaning that the level of fiscal deficit must be sustainable over the long term.

Economic stability also plays a crucial role. Zee (1988) highlights that a key condition for stability is that an economy's growth rate surpasses the interest rate. With constant positive per capita debt, this facilitates the convergence of public debt levels toward a steady state where government spending optimizes long-term welfare (steady-state utility), leading to sustainability. This perspective is aligned with Diamond's (1965) growth model, which suggests that stability requires, at a minimum, the cost of debt service to equate with the economic growth rate. Additionally, it corresponds with the Blinder-Solow (1974) aggregate demand model, which mandates that the marginal increase in the budget deficit from new debt equals the marginal rise in output and tax revenue.

Quintos (1995) makes a distinction between strong and weak sustainability conditions:

Strong Sustainability: Requires the debt process itself to be stable (stationary).

Weak Sustainability: Calls for debt to grow at a rate slower than the economy.

Modern literature frequently presents sustainability through necessary and sufficient conditions.

The necessary condition reflects the Domar stability condition (growth rate  $>$  interest rate). The sufficient condition emphasizes that simply having a stable debt-to-GDP ratio does not always serve as a dependable measure. In circumstances where the interest rate is higher than the growth rate, even maintaining a primary budget balance (excluding interest) can lead to an ever-increasing debt-to-GDP ratio. In such cases, a sufficient primary surplus is essential to bridge the gap between the interest rate and the growth rate, thus stabilizing the debt ratio.

Various indicators are employed to evaluate fiscal sustainability. The debt-to-GDP ratio is one of the most widely recognized and straightforward indicators for assessing fiscal sustainability, as it compares a nation's public debt to its gross domestic product. This ratio can be represented as either gross debt or net debt, depending on whether the government's financial assets, such as bonds and equities, are deducted from total liabilities. Hence, the net-debt-to-GDP ratio illustrates the difference between gross debt and the government's liquid financial assets (IMF, 2023).

While net debt provides a more detailed perspective, particularly when governments might sell assets to meet liabilities, it comes with certain drawbacks. The primary limitation is the uncertainty regarding the liquidity of these assets, which makes their use for immediate debt repayment problematic. Therefore, a rising debt-to-GDP ratio is often seen as a warning sign of possible solvency troubles. Conversely, a decreasing ratio is utilized by governments to

showcase fiscal improvement and strengthen confidence in their long-term financial health (OECD, 2022).

Fundamentally, fiscal sustainability entails more than just balancing budgets; it involves ensuring that fiscal policy is credible, flexible, and resilient in response to economic disruptions. This necessitates responsible debt management, effective public expenditure, and a dedication to structural reforms that promote growth and revenue generation over time.

### **2.1.2 Inflation**

Inflation can be generally understood as a prolonged rise in the overall price level of goods and services in an economy over time, resulting in a reduction of money's purchasing power. It is usually assessed through indicators like the Consumer Price Index (CPI) and the Wholesale Price Index (WPI), which monitor variations in the cost of a typical collection of goods and services (CBN, 2016; World Bank, 2019). As noted by Mensumane (2017), inflation occurs when the amount of money in circulation increases disproportionately compared to the availability of goods and services, resulting in a significant drop in the value of money. This perspective aligns with classical economic theory, which interprets inflation as a monetary imbalance. In Nigeria, inflation has continuously posed a macroeconomic issue, with rates often surpassing the target range set by the Central Bank of Nigeria. As of September 2023, the National Bureau of Statistics (NBS) indicated an inflation rate of 26.72%, influenced by the removal of fuel subsidies, depreciation of the exchange rate, and disruptions in food supply (NBS, 2023).

#### **Types of Inflation**

1. Demand-Pull Inflation: This type of inflation occurs when the demand for goods and services exceeds their supply. It is typically fueled by increased spending by consumers, government

investments, or business expenditures. In Nigeria, instances of fiscal stimulus and expansionary monetary policies have been linked to demand-pull inflation (Kachanovich et al., 2023).

2. Cost-Push Inflation: This inflation results from escalating costs of production, including wages, fuel expenses, and the prices of imported materials. The abolition of fuel subsidies and the depreciation of the naira have been significant factors contributing to cost-push inflation in Nigeria (NBS, 2023).

3. Built-In Inflation (Wage-Price Spiral): This occurs when employees seek higher wages to cope with rising prices, which subsequently raises production costs and triggers further price increases. Such a cycle has been noted in wage negotiations within Nigeria's public sector (Mensumane, 2017).

4. Hyperinflation: This is a severe form of inflation where prices increase uncontrollably. Although Nigeria has not faced hyperinflation in its recent past, the experience of triple-digit inflation during the 1990s highlighted concerns regarding fiscal discipline and the credibility of monetary policy (CBN, 2006).

5. Stagflation: This is an unusual occurrence where inflation exists alongside high unemployment and stagnant economic growth. Nigeria went through stagflation during the recession in 2016, facing inflation rates over 18% while GDP fell by 1.6% (World Bank, 2017).

6. Anticipated vs. Unanticipated Inflation: Anticipated inflation is predictable and can be budgeted for, whereas unanticipated inflation takes markets by surprise, resulting in disruptions

to contracts and savings. In Nigeria, inflation frequently occurs unexpectedly due to policy changes and external vulnerabilities (Brar, 2019).

### **Effect of Inflation on Fiscal Sustainability**

Inflation poses a significant threat to fiscal sustainability, which is defined as a government's capacity to uphold its current spending, taxation, and policy frameworks without risking insolvency or long-term macroeconomic instability (Chapman, 2008). One major impact is revenue distortion, where inflation causes tax bracket creep and erodes the real tax base, especially when thresholds aren't adjusted, while also affecting VAT collections if consumption declines (Chitiga-Mabugu & Monkam, 2013). On the expenditure side, inflation drives up the nominal costs of public services, including wages, subsidies, and infrastructure, often leading to budget overruns (Honadle, Costa & Cigler, 2004). It also undermines budget credibility, making revenue and expenditure forecasts unreliable and complicating medium-term planning (Essang, 2024). While inflation may reduce the real burden of fixed-rate debt, it simultaneously increases nominal interest rates, limits fiscal space, and diverts funds from productive uses (Sargent & Wallace, 1981). Moreover, persistent inflation erodes public trust in fiscal institutions, prompting investor caution and political pressure for unsustainable spending (Umaru & Zubairu, 2012). In Nigeria, inflation has exacerbated fiscal challenges through fuel subsidy removal, exchange rate depreciation, and rising food costs, all of which have strained budgets and triggered emergency responses. The Athena Centre for Policy and Practice (2024) notes that Nigeria's debt service-to-revenue ratio has surpassed 100%, driven by inflation-induced spending and unstable revenue flows.

#### **2.1.3 Interest Rate**

Interest rates refers to the cost associated with borrowing money or the profit earned from lending funds, usually indicated as a percentage of the principal amount over a designated period. They are a fundamental aspect of monetary economics, affecting consumption, investment, savings, and government fiscal activities. Mushtaq and Siddiqui (2016) describe interest rates as the cost required for the utilization of money, acting as an indicator for resource distribution in financial markets. The Central Bank of Nigeria (CBN) refers to an interest rate as the charge for utilizing credit by borrowers and the gain for forgoing liquidity by lenders over time (CBN, 2016). The Monetary Policy Rate (MPR), established by the CBN, functions as a standard for other market rates, including those for lending and deposits.

### **Types of Interest Rates**

Based on the findings of Kama et al. (2020) and El-Yaqub et al. (2024), interest rates in Nigeria can be classified as follows:

1. Nominal Interest Rate: - This is the stated rate without considering inflation adjustments, representing the visible cost associated with borrowing.
2. Real Interest Rate: - This is adjusted for inflation, indicating the actual cost of borrowing. Real interest rates are essential for making investment choices.
3. Fixed vs. Variable Interest Rates: - Fixed rates stay unchanged throughout the duration of the loan, while variable rates can change based on market fluctuations or alterations in policies.
4. Short-Term vs. Long-Term Rates: - Short-term rates apply to financial instruments such as treasury bills, whereas long-term rates pertain to bonds and mortgages.

5. Policy Rate (MPR): - Determined by the CBN, it impacts other rates within the economy. In 2023, Nigeria's MPR was reported at 18.75%, marking the peak level in over ten years (CBN, 2023).

Interest rates significantly influence fiscal sustainability through various interconnected channels. Increased interest rates elevate public borrowing costs by raising the expenses associated with issuing government securities, thus enhancing debt service obligations and restricting fiscal adaptability (Essien et al., 2016). Moreover, variations in interest rates create difficulties in budget planning since governments may incorrectly estimate debt servicing expenses, leading to budget deficiencies and the necessity for additional appropriations (CBN, 2020). Furthermore, interest rates affect economic growth, which has a direct impact on tax income; elevated rates can hinder growth, reduce revenue flows, and worsen fiscal deficits (El-Yaqub et al., 2024). In summary, a high-interest rate landscape dissuades private sector investments, resulting in sluggish GDP growth and a reduced tax revenue base, which jeopardizes long-term fiscal stability (Mushtaq & Siddiqui, 2016). Lastly, while alterations in interest rates are frequently utilized to manage inflation, they may be unproductive when inflation arises from structural problems, potentially worsening fiscal challenges instead (Oyadeyi, 2023).

#### **2.1.4 Government Revenue (Oil Revenue Focus)**

Government revenue represents the total income collected by the state from various channels, which allows it to support public spending, maintain infrastructure, provide essential services, and strive for development goals. In Nigeria, government revenue is mainly divided into oil revenue and non-oil revenue, with oil revenue having historically been the dominant component. Berembo and Igbonikon (2020) state that oil revenue consists of proceeds from petroleum profit

tax, royalties, crude oil exports, gas sales, and licensing fees, regularly accounting for over 70% of the country's overall government income.

The discovery of crude oil in Oloibiri in 1956 was a significant milestone in Nigeria's economic trajectory. Oil swiftly replaced agriculture as the main revenue source and provider of foreign exchange. Nevertheless, this transition also brought about considerable vulnerabilities within the economy. The instabilities of global oil prices, along with domestic production issues, have rendered Nigeria's revenue base highly erratic. As Atayi et al. (2024) point out, changes in oil prices directly influence budget execution, debt growth, and macroeconomic stability.

Government revenue should not only be viewed as a fiscal input; it also reflects a nation's economic framework, policy priorities, and institutional capabilities. Nigeria's excessive reliance on oil revenue has resulted in what experts describe as "fiscal illusion," where temporary increases conceal fundamental structural deficits (Berembo & Igbonikon, 2020). Such illusion frequently leads to unsustainable spending patterns, a lack of budget discipline, and enhanced susceptibility to external shocks.

From a theoretical perspective, oil revenue must be examined within the larger context of fiscal sustainability. Fiscal sustainability involves the government's capacity to continue its current spending and revenue strategies without accruing unsustainable debt or jeopardizing future economic stability (Chapman, 2008). In oil-dependent nations like Nigeria, fiscal sustainability is intrinsically linked to the performance, management, and diversification of oil revenue.

Oil revenue acts as a crucial foundation of Nigeria's macroeconomic framework, supporting essential elements of the country's fiscal activities. It is instrumental in budget implementation by funding both recurrent and capital expenses, while simultaneously generating foreign

exchange that aids in stabilizing the naira and strengthening external reserves. Furthermore, petroleum revenue aids in debt servicing, allowing the nation to honor external commitments and lessening its dependence on borrowing. Beyond these roles, it promotes public investment in vital sectors such as infrastructure, education, and healthcare, thus contributing to overall socio-economic progress. Research has well-established that variations in oil revenue considerably affect inflation, output growth, and exchange rate behavior in Nigeria, with institutional factors significantly influencing fiscal responses (Ushie, Adeniyi & Akongwale, 2012). However, the heavy reliance on oil revenue makes Nigeria vulnerable to price fluctuations, external disruptions, and fiscal instability. Appah (2022) observes that the unpredictability of oil prices has resulted in frequent budget amendments, increased borrowing, and unsatisfactory fiscal results. Therefore, the economic justification for managing oil revenue is rooted in its ability to either stabilize or destabilize the fiscal landscape, depending on how it is utilized.

As highlighted by Appah (2022) and the CBN (2021), Nigeria's oil revenue consists of several components. Government revenue in Nigeria can be categorized into two principal types: tax revenue and non-tax revenue. Tax revenue represents obligatory charges imposed by the government on individuals, corporations, and institutions, and is regarded as the most consistent and ubiquitous source of income across all levels of government (Nigerian Scholars, n.d.). Key elements of tax revenue include company income tax (CIT), value-added tax (VAT), personal income tax (PIT), petroleum profit tax (PPT), customs and excise duties, capital gains tax, stamp duties, and tenement rates, each aimed at specific economic activities such as earnings, consumption, property ownership, and legal transactions (Nigerian Finder, 2018; Oasdom, 2025).

Non-tax revenue encompasses all funds obtained by the government from sources other than taxes. This includes fees and charges for public services, penalties and fines, earnings from rents

and royalties related to natural resources, dividends from state-owned businesses, grants and foreign assistance, loans and borrowings, seigniorage (income derived from the creation of money), and proceeds from lotteries (Oasdom, 2025; Nigerian Scholars, n.d.). In Nigeria, the framework for revenue generation is divided among three levels of government. The federal government primarily generates its income from oil-related activities such as petroleum profit taxes, royalties, and the sale of crude oil, in addition to corporate income taxes, customs and excise duties, VAT (which is shared with the states), and stamp duties (Schoolings, n.d.). State governments obtain revenue through personal income taxes, road taxes, business premises registration fees, and charges for services such as education and healthcare (InfoGuide Nigeria, n.d.). At the local government level, funding is sourced from tenement rates, market stall fees, dues from motor parks, and fees for marriage registration to support their activities (Oasdom, 2025). This multi-level system guarantees that revenue generation is spread across all tiers of governance.

## **2.2 Theories of Fiscal Sustainability**

### **2.2.1 Resource Curse Theory**

The resource curse theory was first presented by Auty in 1993 in his influential publication "Sustaining Growth in Mineral Economies." This theory posits that nations endowed with natural resources, especially non-renewable ones such as oil, frequently face economic difficulties, including challenges in establishing sustainable fiscal practices and addressing underdevelopment. Various elements contribute to this predicament, including an over-reliance on resource exports, volatile commodity prices, corruption, poor governance, and Dutch disease,

which happens when a resource boom causes currency appreciation that negatively affects other economic sectors. Collier and Hoeffler (2002) contend that the existence of natural resources can trigger conflicts within societies, as different factions vie for control over these valuable commodities. This rivalry often obstructs the effective utilization of resources to promote social and economic progress, restricting the chances for sustainable development. As a result, the development objectives pursued by resource-rich nations are frequently unrealistic and impeded by low economic growth, instability, authoritarian governance, conflict, and fragile institutions. The resource curse can also hinder nations from diversifying their economies, making them more susceptible to external disruptions and stalling long-term growth. Furthermore, the existence of valuable resources can breed political instability and the emergence of authoritarian regimes as influential groups compete for access and advantages. To address the resource curse, countries commonly adopt strategies that foster economic diversification, enhance governance, combat corruption, and promote sustainable development. Additionally, an economy reliant on resources can gain from transparent management of resource income through mechanisms like sovereign wealth funds, which can help lessen adverse effects. Auty (1998) suggests that the resource curse theory illustrates why resource-abundant nations often struggle to convert their wealth into economic advancement. Frequently, these countries experience slower economic growth rates than those with fewer natural resources. An example of this phenomenon is the Dutch Disease syndrome, which creates conditions that inhibit economic diversification and generally jeopardize non-oil activities. One limitation of the resource curse theory lies in its intrinsic negative relationship between economic performance and the presence of natural resources. As such, this theory does not account for specific nations that have managed to evade the resource curse. This indicates that there may be essential factors missing from the resource curse

framework. One vital element could be the quality of institutions, the composition of the economy, or other pertinent aspects.

### **2.2.2 Fiscal Reaction Theory/Function (FRF)**

The Fiscal Reaction Theory, first proposed by Bohn in 1998, indicates that for a government to maintain sustainable fiscal policy, it is essential to continually modify its primary budget balance. This adjustment entails either decreasing deficits or enhancing surpluses excluding interest expenses when public debt levels increase. According to Checherita-Westphal and Žďárek (2017), this concept has led to the creation of empirical models that examine how changes in debt levels impact the primary balance. Nevertheless, Bouabdallah et al. (2017) highlight a limitation: the theory fails to consider the original size of the debt, which might be seen by financial markets as excessively large, and it overlooks the real-world challenges of sustaining primary surpluses, particularly those related to political instability or weak institutional frameworks. Despite these limitations, the Fiscal Reaction Framework remains significant. It provides insights into historical fiscal policy reactions and offers direction on potential issues in future policy decisions. Furthermore, it empowers governments with strategies to predict and react to macroeconomic changes that may be influenced by political or institutional factors.

### **2.2.3 The Ricardian Equivalence Theory**

The Ricardian Equivalence Theory was proposed in the 19th century by British economist David Ricardo (1772–1823). It posits that increasing government expenditure through borrowing will

not effectively boost economic growth if overall demand remains unchanged. The theory presumes that individuals, anticipating future tax increases to repay the debt, will choose to save rather than spend any additional income they receive. Consequently, people view government financial support as temporary increases rather than permanent enhancements to their wealth.

In summary, the theory contends that whether a government finances its expenditures through borrowing or by lowering taxes, the effect on demand stays neutral. Critics, however, have questioned this perspective, arguing that it is based on unrealistic assumptions, such as people always saving in expectation of future taxes. It also assumes that financial markets, the overall economy, and personal incomes will not fluctuate, and that those receiving government assistance will not feel driven to spend their extra funds.

#### **2.2.4 The Intertemporal Government Budget Constraint (IGBC) Theory**

The foundation of this research is rooted in the theory of the Intertemporal Government Budget Constraint (IGBC). This theory, articulated by Robert Barro in 1974, highlights the significance of maintaining a government's fiscal policy balance over the long term. Barro's exploration of this idea contends that a government's existing debt must be counterbalanced by anticipated surpluses in the future to ensure fiscal sustainability (Barro, 1974). Additionally, Barro's theoretical insights connect with the wider Ricardian Equivalence hypothesis, which posits that government debt does not significantly impact the economy if households recognize that future taxes will increase to compensate for the debt. This framework is premised on the notion that fiscal sustainability is dependent on future generations' capacity to manage the responsibility of repaying government debt through elevated taxes or reduced public expenditure (Calvo, 2021).

#### **2.2.5 The Fiscal Theory of the Price Level (FTPL)**

The Fiscal Theory of the Price Level (FTPL), introduced by Sargent and Wallace in 1981 and further expanded by Leeper in 1991, connects government fiscal policy with inflation patterns. This theory posits that when fiscal policy takes precedence over monetary policy, price levels adjust to maintain the government's intertemporal budget constraint. In this scenario, inflation is a reflection of the government's fiscal policy. Increased fiscal deficits can lead to elevated price levels, particularly when there is monetary accommodation. This rationale supports the inclusion of inflation as a key explanatory factor in the model.

### **2.3 Empirical Literature Review**

Empirical studies related to economic stability and sustainability vary across different national settings, even though the macroeconomic variables exert differing impacts from one country to another. For example, Akanni and Osinowo (2013) investigate how fiscal instability affects Nigeria's economic growth by analyzing time series data from 1970 to 2010. Using Hodrick-Prescott (HP) filtering and correlation analysis to evaluate fiscal spending and output, their results reveal significant fluctuations in real GDP and fiscal expenditures from 1970 to 1985, a countercyclical fiscal trend from 1970 to 1986, and a period between 1987 and 2010 characterized by stable fiscal spending and ongoing GDP instability. The authors conclude that maintaining fiscal discipline is crucial for creating a sustainable economic environment in Nigeria.

In a similar investigation, Komarkova et al. (2013) explore the relationship between fiscal sustainability and financial stability, stressing the necessity of considering the degree to which

debt sustainability depends on the debt-to-GDP ratio as well as broader macroeconomic factors like growth and interest rates. Their analysis focuses on prudential policy measures designed to reduce sovereign risk on national balance sheets. The researchers claim that the growing interconnectedness of fiscal and financial stability corresponds with the increasing interaction between government and the financial sector. However, a critical examination of the study highlights a lack of a specified time frame, which weakens the temporal comparison of macroeconomic and financial variables, especially due to their dynamic nature. Including a temporal aspect would have enriched the analysis and enabled better comparisons across studies.

Additionally, Ayinde (2014) analyzes the sustainability of fiscal management in Nigeria for the period of 1970 to 2011. By applying an extensive range of econometric tests to disaggregated components of government expenditure, the study reveals both robust and fragile forms of fiscal unsustainability. The findings also suggest that the outcomes of fiscal policy are dependent on the regime, which complicates the pursuit of consistent fiscal discipline.

Likewise, Oyeleke and Ajilore (2014) explore whether Nigeria's fiscal policy conformed to the intertemporal budget constraint between 1980 and 2010. Using the error correction model and the Engle-Granger cointegration technique, they analyze the long-term equilibrium relationship between government revenue and expenditure. Nevertheless, a methodological critique indicates that the unit root tests show variable integration at levels  $I(0)$  and  $I(1)$ , making the Engle-Granger method unsuitable for cointegration analysis. The Autoregressive Distributed Lag (ARDL) model would have been a more fitting choice due to its robustness in managing variables

integrated at different orders (Pesaran & Shin, 1999; Pesaran et al., 2001). Utilizing ARDL could have resulted in more accurate and detailed insights into fiscal sustainability.

Okwoche and Iheonu (2021) investigated the determinants of fiscal effort in sub-Saharan Africa (SSA) through the framework of fiscal reaction functions. This study employed various panel econometric methodologies to address endogeneity issues, specifically using instrumental variables combined with fixed effects, the two-step generalized method of moments (GMM), and conventional two-stage least squares techniques. The results indicate that while SSA governments have implemented fiscal adjustments in response to increasing debt levels, conflicts hinder these adjustments. Furthermore, the study reveals evidence of fiscal fatigue within the fiscal reaction functions of SSA.

In a distinct analysis, Imoisi (2022) investigated the relationship between fiscal policy and the sustainability of public debt in Nigeria from 1970 to 2019 using a multivariate method. The autoregressive distributed lag (ARDL) bounds test was employed to assess the long-term connections among the variables. Findings from the ARDL test indicated a long-term relationship, with budget deficits having a notable and positive effect on public debt in both the short and long run. However, factors such as interest rates, real gross domestic product, and inflation rates were deemed statistically insignificant across the evaluated periods, suggesting no influence on public debt. As a result, it is essential to reevaluate the budgeting process at both the federal and state levels in Nigeria to improve the efficiency of resource allocation within the budgeting system.

Mojeed, Shuaibu, and Duru (2022) employed the debt-to-revenue ratio as an indicator of debt sustainability to assess Nigeria's debt sustainability from 1980 to 2019. Their results imply that the debt-to-government revenue ratio provides a more accurate representation of domestic debt sustainability in Nigeria compared to the debt-to-GDP ratio. Additionally, counterfactual simulations revealed that enhancing domestic revenue generation leads to a more sustainable debt landscape. The analysis identified long-term factors influencing debt in Nigeria, including interest rates, GDP growth rates, and financial depth. Conversely, contemporary factors encompassed inflation, exchange rates, trade openness, and the federal government's total expenditure as a share of government revenue.

Kurniawan (2016) evaluated the robustness of Indonesia's fiscal policy by studying how the primary budget balance responds to increasing debt levels and whether the debt-to-GDP ratio is inclined to revert to its average. Utilizing annual data from 1990 to 2010, the research employed a debt dynamics model and a fiscal response function that factored in business cycle effects and short-term government spending. The findings indicated that the primary balance adjusted positively to changes in debt levels.

Owolabi and Dauda (2017) analyzed Nigeria's fiscal sustainability from 1961 to 2013 using the ARDL cointegration model. Bai-Perron breakpoint tests indicated that the ongoing fiscal deficits were primarily attributed to structural shifts in 1981. Although fiscal deficits demonstrated weak sustainability prior to 1981, they exhibited greater stability subsequently.

Likewise, investigations by Okoye et al. (2019), Adeosun and Adedokun (2019), Otonne and Oyenuga (2019), and Ogiji and Ajayi (2020) evaluated Nigeria's fiscal response and public debt sustainability using conventional unit root tests and the ARDL bounds testing technique to establish cointegration. These studies concluded that fiscal deficits were influenced by factors such as inflation, oil revenues, and prior exchange rate levels. Furthermore, external debt and current exchange rates contributed to a decrease in fiscal deficits.

Aleme (2019) examines the factors affecting the sustainability of Ethiopia's foreign debt by analyzing annual time series data from 1980 to 2016 through a log-linear regression model. The results indicate that the debt service-to-GDP ratio and the real effective exchange rate had a statistically significant positive effect on debt sustainability. In contrast, the terms of trade and foreign real interest rate were found to be statistically significant but had a negative relationship with debt sustainability. Empirical studies on economic stability and sustainability occur across different national contexts, even though the influence of macroeconomic variables can vary significantly between countries. For example, Akanni and Osinowo (2013) investigate how fiscal instability affects Nigeria's economic growth using time series data from 1970 to 2010. By applying Hodrick-Prescott (HP) filtering and correlation analysis to assess fiscal expenditure and output, their results reveal notable volatility in both real GDP and fiscal spending during 1970-1985, a countercyclical fiscal trend from 1970-1986, and a period of relatively stable fiscal expenditure coupled with ongoing GDP instability from 1987 to 2010. The study concludes that maintaining fiscal discipline is essential for creating a sustainable economic environment in Nigeria.

Bohn (1998) conducted a significant empirical analysis titled "The Behavior of U.S. Public Debt and Deficits," which was published in *The Quarterly Journal of Economics*. This study assessed

the long-term viability of the United States' fiscal policy using annual data from 1916 to 1995. By utilizing a fiscal reaction function, Bohn examined whether the primary surplus increases in response to rises in the debt-to-GDP ratio, a necessary condition for fiscal sustainability under the intertemporal budget constraint (IBC). Through regression analysis that accounted for cyclical and wartime impacts, the study identified a statistically significant positive correlation between the primary surplus and the debt ratio. This finding suggests that as debt increases, fiscal authorities enhance the surplus, preventing debt from escalating indefinitely. Bohn concluded that U.S. fiscal policy is aligned with long-term sustainability since the government modifies its fiscal position in reaction to debt growth. His findings support the intertemporal budget constraint theory and present a framework that other nations can use to evaluate their debt sustainability.

Adamu (2017) performed an empirical investigation titled "Oil Revenues, External Debt, and Growth in Nigeria," focusing on the dynamic interplay between oil revenue, external debt, and economic performance in Nigeria from 1970 to 2015. The study employed the Autoregressive Distributed Lag (ARDL) bounds testing method to analyze both short-term and long-term relationships among the variables. The findings indicated that oil revenues and public investment have a positive and statistically significant effect on Nigeria's economic growth, whereas external debt and population growth negatively influence output. Though the main emphasis of the study was on growth rather than debt sustainability, the outcomes are directly relevant for fiscal stability. Adamu (2017) highlighted that oil revenues are crucial in determining fiscal outcomes in Nigeria, as increased oil income diminishes the need for borrowing and enhances fiscal health. Conversely, dependence on external borrowing during downturns in oil prices

amplifies fiscal risks. This reinforces the notion that variations in oil revenue are vital for understanding fiscal sustainability in oil-dependent nations like Nigeria.

## **CHAPTER THREE**

### **THEORETICAL FRAMEWORK AND METHODOLOGY**

This study is anchored on the Intertemporal Budget Constraint (IBC) Theory, which forms the foundation for assessing the sustainability of public debt in an economy. The theory explains that a government's fiscal policy is sustainable when the present value of expected future primary surpluses equals or exceeds the current level of public debt (Bohn, 1998). In other words, the government can borrow to finance short-term deficits, but in the long run, its revenue generation capacity must be strong enough to cover both interest payments and principal repayments (Trehan & Walsh, 1988).

The intertemporal budget constraint is expressed as:

$$B_t = \sum_{s=t+1}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} E_t [PS_s]$$

Where:

$B_t$  = Public debt level at time  $t$

$PS_s$  is the primary budget surplus (government revenue minus non-interest spending) at time  $s$

$r$  is the discount rate often the interest rate

$E_t$  is the expectations operator based on information available at time  $t$

Summarily, the equation means that the current debt must be equal to the sum of all expected future budget surpluses, discounted to their value in today terms

The IBC theory highlights the role of both macroeconomic and fiscal variables in determining debt sustainability. Take the case of Nigeria, oil revenue represents the main fiscal source for servicing debt. Higher oil revenue strengthens government finances and supports debt repayment

capacity, while lower oil revenue can worsen debt sustainability. The interest rate determines the cost of borrowing; higher interest rates results to increase debt servicing pressure. Real GDP growth improves sustainability by expanding the tax base and reducing the debt burden relative to output, while inflation affects the real value of debt. However, moderate inflation can reduce the real burden of debt, but excessive inflation may signal fiscal and monetary instability.

Hence, the IBC theory provides a holistic framework linking oil revenue, interest rate, inflation, and real GDP to debt-to-GDP dynamics, explaining how fiscal and macroeconomic factors jointly determine the sustainability of public debt in Nigeria.

### 3.2 Methodology

#### 3.2.1 Model Specification

The functional form of the model for examining the determinants of fiscal sustainability in Nigeria is given as;

$$DEBT = f(OILREV_t, INT_t, INF_t, GDP_t) \dots \dots \dots 1$$

Where:

DEBT=Public Debt to GDP Ratio ( proxy for fiscal sustainability)

OILREV=Oil Revenue

INT= Real Interest rate( %)

INF= Inflation rate (CPI%)

GDPR= Real GDP growth (%)

Rewriting the above general functional into an empirical model for examining the relationship between the determinants of fiscal sustainability is given as;

$$\text{DEBTGDP}_t = \beta_0 + \beta_1 \text{OILREV}_t + \beta_2 \text{INT}_t + \beta_3 \text{INF}_t + \beta_4 \text{GDPR}_t + \mu_t \dots \dots \dots 2$$

Where;  $\beta_0 - \beta_4$  are the parameters to be estimated and  $\mu_t$  is the error term.

To improve the statistical properties of the data and enhance the reliability of estimation result, this study applies logarithm transformation of selected variables such as Public Debt to GDP ratio and Oil revenue.

Transformation into log linear econometric form;

$$\ln(\text{DEBTGDP}) = \beta_0 + \beta_1 \ln(\text{OILREV}_t) + \beta_2 (\text{INT}_t) + \beta_3 (\text{INF}_t) + \beta_4 (\text{GDPR}_t) + \mu_t \dots \dots \dots 3$$

Based on the model, the apriori expectation are stated thus;

$$\beta_1 < 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0$$

This implies that;

$\beta_1 < 0$  implies that an Increase in oil revenue is expected to reduce debt to GDP ratio while a decline in oil revenue, is expected to increase the Debt to GDP ratio.

$\beta_2 > 0$  implies that a higher interest rate is expected to increase in debt to GDP ratio as it increases cost of borrowing

$\beta_3 > 0$  implies that a higher inflation rate is expected to increase in debt to GDP ratio, since it can erode real government revenues and worsen fiscal balances

$\beta_4 < 0$  implies that a higher real GDP growth rate is expected to reduce the debt to GDP ratio, as economic growth improves revenue generation and fiscal sustainability.

### **3.2.2 Estimation Techniques**

This study employs the Autoregressive Distributed Lag (ARDL) Bounds Testing approach. This model is suitable for the time series data with variables of mixed integration orders  $I(0)$  and  $I(1)$ , and allows for the estimation of both short run and long run dynamics. Given that studies on macroeconomic variables often involve mixed integration order (e.g. Kolapo, Oke, & Olaniyan (2018) employ the ARDL bounds method on Nigerian data and establish a long-run relationship among variables) the ARDL technique offers a more complete investigation of dynamic interrelationships than simpler methods such as Ordinary Least Squares (OLS), which may yield spurious regression when variables are non-stationary. Estimation of the model parameters is carried out using the *EViews 10* econometric software.

### **3.3 Sources OF Data**

Data for the study were collected from 1990 to 2023 so as to have a comprehensive dataset on all the variables of the study. This study employed data from World Bank Development Indicators (WDI) and Central Bank of Nigeria Statistical Bulletin. Specifically, secondary data on debt to GDP ratio, interest rate, and inflation were sourced from the WDI. While oil revenue was sourced from the Central Bank of Nigeria Statistical Bulletin.

## **CHAPTER FOUR**

### **EMPIRICAL RESULTS AND DISCUSSION**

#### 4.1 DESCRIPTIVE STATISTICS

Descriptive statistics offer essential insights into the central tendencies, variability, and distributional attributes of the dataset. These initial findings are vital prior to engaging in more complex econometric modeling because they reveal potential concerns like outliers, skewness, and kurtosis that can affect model assumptions and interpretations. In Table 4.1, the descriptive statistics for both the dependent and independent variables are displayed in their original form.

**Table 4.1 Descriptive statistics**

	DEBTGDP	OILREV	INT	INF	GDPR
Mean	34.44353	3319.309	8.483529	18.27912	4.245753
Median	29.44500	3592.450	6.450000	12.94500	4.213000
Maximum	74.96000	8879.000	31.50000	72.84000	15.32920
Minimum	7.280000	71.90000	0.900000	5.390000	-2.035100
Std. Dev.	20.31116	2589.795	6.514879	15.90238	3.905552
Skewness	0.576772	0.257007	1.359896	2.180516	0.500464
Kurtosis	2.245250	1.985835	5.626229	6.855680	3.486561
Jarque-Bera	2.692110	1.831385	20.25032	48.00357	1.754681
Probability	0.260265	0.400239	0.000040	0.000000	0.415888
Sum	1171.080	112856.5	288.4400	621.4900	144.3556
Sum Sq. Dev.	13613.92	2.21E+08	1400.640	8345.223	503.3601
Observations	34	34	34	34	34

**Source: Author's computation, EViews10.**

According to Table 4.1, the average debt-to-GDP ratio (DEBTGDP) stands at 34.44 percent, suggesting that, generally, public debt accounted for about one-third of Nigeria's GDP throughout the sample period. The range is quite broad, with a minimum of 7.28% and a maximum of 74.96%, and the standard deviation of 20.31 indicates considerable year-to-year variation. The skewness value of 0.577 shows a slight rightward tilt, suggesting a few years with high debt levels, while a kurtosis of 2.25 is near the average value of 3, which implies there are no significant extreme outliers. The Jarque-Bera test results ( $JB = 2.692$ ,  $p = 0.2603$ ) indicate that we cannot reject the hypothesis of normality at the 5% significance level. Overall, these statistics reveal that although the average debt level is moderate, there have been notable fluctuations, likely due to intermittent fiscal pressures such as borrowing during times of crisis and subsequent periods of consolidation.

Oil Revenue (OILREV): The mean oil revenue is recorded at 3,319.3, accompanied by a substantial standard deviation of 2,589.80. The range of oil revenue spans from 71.9 to 8,879. The skewness of the distribution is relatively low at 0.257, while the kurtosis slightly falls below the threshold of 3, measuring at 1.986. Additionally, the Jarque-Bera p-value of 0.4002 suggests that, at the 5% significance level, the distribution does not significantly deviate from normality. Economically, the considerable standard deviation and the extreme maximum value indicate a high level of volatility in oil revenues, which aligns with Nigeria's susceptibility to fluctuations in global oil prices. This volatility underscores oil revenue as a significant factor contributing to variations in fiscal results.

Rate of Interest (INT). With a standard deviation of 6.51 and a range of 0.9% to 31.5%, the average interest rate is now 8.48%. The distribution of interest rates appears to be significantly right-skewed and leptokurtic, with the majority of data points concentrated at the lower end of

the spectrum, as indicated by the skewness value of 1.36, the elevated kurtosis of 5.63, and a Jarque-Bera p-value of 0.00004.

Inflation (INF). Inflation ranges from 5.39% to 72.84%, with a mean of 18.279% and a standard deviation of 15.902. The Jarque-Bera statistic ( $JB = 48.004$ ,  $p = 0.0000$ ) clearly rejects normality, while the skewness (2.18) and kurtosis (6.86) are both high. This demonstrates that the sample's inflation is extremely erratic and prone to severe inflationary outbursts. Large inflation shocks can erode actual debt and revenues in complex ways and can skew estimators if they are not taken into account, which is why such behavior is important.

The average real GDP growth rate stands at 4.246%, with a standard deviation of 3.906. The lowest recorded growth is  $-2.035\%$  (indicating a contraction year), while the highest is  $15.329\%$  (reflecting an expansion year). The skewness is 0.50, and the kurtosis is 3.49, both of which are close to normal distribution, and the Jarque-Bera test ( $JB = 1.755$ ,  $p = 0.4159$ ) does not reject the hypothesis of normality. Consequently, the GDP growth series exhibits more regular behavior compared to inflation and interest rate series, demonstrating moderate variability and fewer extreme outliers in relation to inflation.

## **4.2 UNIT ROOT TEST**

A unit root test is performed on time series data to determine whether the data series is stationary. The stationarity of a historical sequence indicates that its mean, variance, and covariance remain constant over time. In essence, it is invariant to time. The research utilized the Augmented Dickey-Fuller Unit Root Test to investigate the unit-root characteristics of the specified regression models. Table 4.2 presents the results of the ADF unit-root test.

**Table 4.2**

VARIABLES	AT LEVEL		AT FIRST DIFFERENCE		REMARK
	ADF STATISTICS	5% STATISTICS	ADF STATISTICS	5% STATISTICS	
INDEBTGDP	-2.111469	-2.957110	-4.116067	-2.957110	I(1)
INOILREV	-2.306559	-2.954021	-5.210112	-2.960411	I(1)
INT	-4.491507	-2.954021	-	-	I(0)
INF	-2.178425	-2.954021	-6.174329	-2.971853	I(1)
GDPR	-3.735593	-2.954021	-	-	I(0)

**Source: Author's computation EViews10**

According to Table 4.2, the Debt-to-GDP ratio (DEBTGDP) exhibits an ADF statistic of  $-2.111$  at its level, which falls short of the 5% critical value of  $-2.957$ . This indicates that the series is non-stationary at levels. Nevertheless, after applying first differencing, the statistic improves to  $-4.116$ , which is greater than the critical value ( $-2.957$ ) in absolute terms.

The ADF statistic for oil revenue (OILREV) at the level is  $-2.4307$ , accompanied by a p-value of  $0.1464$ , which does not reach significance at the 5% level. In contrast, when examining the first differences, the ADF statistic shows a marked improvement at  $-6.5643$  with a p-value of  $0.0000$ , leading to a decisive rejection of the null hypothesis suggesting a unit root. Hence, oil revenue becomes stationary upon first differencing, indicating that it is integrated of order one,  $I(1)$ .

The inflation rate (INF) has an ADF statistic of  $-2.3352$  at level ( $p = 0.1672$ ), which is not significant, indicating non-stationarity. However, after first differencing, the ADF statistic becomes  $-5.7092$  with a p-value of  $0.0000$ , signifying strong stationarity at the first difference. Therefore, inflation is  $I(1)$ .

The real interest rate (INT) is stationary at its level, indicated by an ADF statistic of  $-4.3578$  and a p-value of  $0.0087$ , which is significant at the 5% level. This indicates that we reject the null hypothesis of non-stationarity. Therefore, the interest rate is integrated of order zero,  $I(0)$ .

The ADF test results for real GDP growth (GDPR) indicate a statistic of  $-3.9913$  ( $p = 0.0176$ ), which is significant at the 5% level. This implies that the series is stationary at level,  $I(0)$ . The unit root tests demonstrate that DEBTGDP, INT, and GDPR are stationary at level [ $I(0)$ ], while OILREV and INF become stationary after first differencing [ $I(1)$ ]. The presence of both  $I(0)$  and  $I(1)$  variables meets a crucial criterion for employing the ARDL Bounds Testing approach put forward by Pesaran, Shin, and Smith (2001), enabling estimation when variables are of mixed integration orders (provided none are  $I(2)$ ). Consequently, the results from the ADF tests establish a strong econometric basis for utilizing the ARDL model to investigate both the short-run dynamics and long-run relationships between fiscal sustainability (debt-to-GDP) and its determinants in Nigeria.

### **4.3 ARDL ESTIMATION**

The Augmented Dickey–Fuller (ADF) test was utilized to assess the stationarity characteristics of the time series variables analyzed in this research. The findings, presented in Table 4.2, indicate that the variables exhibit mixed orders of integration. More specifically, the Debt-to-GDP ratio (INDEBTGDP), Interest Rate (INT), and Gross Domestic Product Growth Rate (GDPR) were determined to be stationary at their levels, suggesting they are integrated of order zero,  $I(0)$ . On the other hand, the Oil Revenue (INOILREV) and Inflation Rate (INF) were found to be non-stationary at their levels but achieved stationarity after first differencing, indicating they are integrated of order one,  $I(1)$ . This combination of  $I(0)$  and  $I(1)$  variables validates the use of the Autoregressive Distributed Lag (ARDL) modeling technique for this research. The ARDL approach, as suggested by Pesaran, Shin, and Smith (2001), is particularly effective for estimating both short-run and long-run relationships when the variables have differing orders of integration, as long as none are integrated of order two,  $I(2)$ .

The ARDL estimation was carried out in two phases. The initial phase consisted of implementing the Bounds Test for Cointegration to determine if there is a long-term equilibrium relationship among the variables. The findings from the bounds test indicated that the calculated F-statistic (23.514) surpassed the upper bound critical value at a 5% significance level. This resulted in rejecting the null hypothesis of no cointegration, thereby confirming the existence of a long-run relationship between fiscal sustainability and its determinants.

The subsequent phase focused on estimating both the long-term coefficients and the short-term dynamics of the ARDL model. The long-term estimates provide an explanation of the sustained or equilibrium impacts of the explanatory variables on fiscal sustainability, while the short-term dynamics, represented through the Error Correction Model (ECM), illustrate the rate and manner in which short-term deviations from equilibrium are adjusted over time.

### 4.3.1 ARDL BOUND TEST

The study utilised the bound test approach to ascertain whether there is long run relationship between variables in e model. The result of the bound test is found in Table 4.3

**Table 4.3**

F-Bounds Test		Null Hypothesis: No levels of relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	23.51439	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

**Source: Author's computation EViews10**

The ARDL Bounds test was utilized to investigate the long-term relationship among the Debt to GDP ratio, which serves as an indicator of fiscal sustainability, Oil revenue (OILREV), the Real Interest rate (INT), and the Real GDP growth rate (GDPR). The calculated F-statistic (23.514) significantly exceeds both the lower (2.56) and upper (3.49) critical values at the 5% significance level. According to the guideline established by Pesaran et al. (2001), when the computed F-statistic surpasses the upper bound critical value, it leads to the rejection of the null hypothesis that there is no long-term relationship, thus supporting the alternative hypothesis. This indicates that a robust and statistically significant long-run cointegrating relationship exists between Nigeria's fiscal sustainability (as indicated by the Debt-to-GDP ratio) and its crucial macroeconomic factors, including oil revenue, interest rates, inflation, and real GDP growth. In simpler terms, these variables exhibit synchronized movements over the long term, and any

deviations from their equilibrium paths are temporary in nature rather than permanent.

### 4.3.2 ARDL LONG ESTIMATION

Table 4.4 ARDL Long run result.

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INOILREV	-0.716465	0.083880	-8.541583	0.0001
INT	-0.114333	0.018330	-6.237364	0.0008
INF	-0.016952	0.007147	-2.371919	0.0554
GDPR	-0.071138	0.018057	-3.939623	0.0076
C	10.54325	0.824696	12.78441	0.0000

**Source: Author's computation EViews10, 2025.**

According to table 4.3.2, the oil revenue coefficient stands at  $-0.716$ , accompanied by a probability value of  $0.0001$ , which is statistically significant at the 5% threshold. This suggests that, while controlling for other variables, a 1% rise in oil revenue leads to a 0.716 percentage decrease in the debt-to-GDP ratio. The significant negative correlation supports the initial expectation mentioned in chapter three, indicating that greater oil revenue enhances fiscal sustainability by diminishing the dependency on borrowing. When oil revenues are robust, government income increases, which facilitates debt repayment and lessens the necessity for deficit financing. In contrast, a decline in oil income due to global price fluctuations typically

results in an uptick in borrowing. These findings echo the work of Iyoha and Oriakhi (2013) and Adedokun (2018), who also found that oil revenue plays a crucial role in stabilizing Nigeria's fiscal situation. From an economic perspective, this reaffirms Nigeria's significant reliance on the oil sector for managing debt and achieving fiscal balance, underscoring the fiscal sustainability's vulnerability to changes in the global oil market. The interest rate coefficient is  $-0.114$ , with a p-value of  $0.0008$ , indicating a negative and significant long-term association with debt-to-GDP at the 5% significance level.

Even though it is generally anticipated that increased interest rates may exacerbate debt burdens, the negative relationship indicated suggests that, in the long term, a rise in interest rates is associated with a reduction in the debt-to-GDP ratio. This observation can be understood to imply that prolonged higher interest rates serve as a monetary discipline tool, restraining excessive borrowing by elevating the cost of financing. In the context of Nigeria, such a policy approach may promote fiscal discipline and careful debt management by reducing the tendency for frequent borrowing. This long-term behavior contrasts with the short-term dynamics (elaborated on later in Section 4.5), where elevated interest rates typically lead to a temporary worsening of debt ratios. The long-run effect noted here aligns with the findings of Ajayi and Omotosho (2019), who determined that stricter monetary conditions can enhance fiscal sustainability in developing nations by restraining the accumulation of public debt.

The inflation coefficient stands at  $-0.017$  with a p-value of  $0.0554$ , marginally exceeding the 5% significance threshold. This indicates a negative association, yet it is not statistically significant at the 5% level. The negative value suggests that rising inflation may slightly diminish the real worth of public debt, likely due to inflation's capacity to erode the debt. However, the lack of significance means that inflation's influence on debt sustainability remains feeble and unreliable.

This is in line with theoretical perspectives suggesting that while moderate inflation can diminish the real value of nominal debt, sustained or high inflation can jeopardize fiscal credibility and elevate borrowing expenses.

The GDP growth rate coefficient is  $-0.071$  and is significant at the 5% level ( $p = 0.0076$ ), implying that a 1% rise in real GDP growth decreases the debt-to-GDP ratio by approximately 0.071 percentage points. This outcome aligns with theoretical expectations and the initial assumption of a negative correlation outlined in chapter three of this research. Economic growth boosts revenue generation, enhances the ability to manage debt, and decreases the relative debt burden. Continuous growth thus fortifies fiscal stability by broadening the economic base from which the government can generate revenue. This conclusion is supported by Bohn (1998) and Obi and Nurudeen (2020), who highlighted that robust and consistent GDP growth improves fiscal balance and boosts debt sustainability in developing nations.

The intercept term ( $C = 10.543$ ,  $p = 0.0000$ ) is both positive and statistically significant. It indicates the baseline debt-to-GDP ratio when all other explanatory variables are controlled for. The positive constant implies that, even without oil revenue and economic growth, Nigeria's debt-to-GDP ratio would continue to be high because of structural fiscal imbalances, persistent spending pressures, and obligations related to debt servicing.

### 4.3.3 SHORT RUN ECM RESULT

**Table 4.5 Short run result**

ECM Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INDEBTGDP(-1))	0.326499	0.059610	5.477279	0.0015
D(INDEBTGDP(-2))	0.372590	0.063388	5.877901	0.0011
D(INDEBTGDP(-3))	0.701334	0.069046	10.15747	0.0001
D(INOILREV)	-0.131298	0.050788	-2.585217	0.0415
D(INOILREV(-1))	-0.132404	0.050583	-2.617532	0.0397
D(INOILREV(-2))	-0.291229	0.042407	-6.867458	0.0005
D(INOILREV(-3))	-0.510275	0.054076	-9.436317	0.0001
D(INT)	0.011884	0.004476	2.655251	0.0378
D(INT(-1))	0.061110	0.004529	13.49378	0.0000
D(INT(-2))	0.044370	0.003665	12.10633	0.0000
D(INF)	-0.015832	0.002742	-5.773472	0.0012
D(INF(-1))	0.005761	0.002430	2.371464	0.0554
D(INF(-2))	-0.006365	0.002455	-2.593033	0.0410

D(INF(-3))	0.006367	0.001836	3.468258	0.0133
D(GDPR)	-0.031975	0.005463	-5.853198	0.0011
D(GDPR(-1))	0.022529	0.004670	4.823824	0.0029
D(GDPR(-2))	0.064391	0.005128	12.55705	0.0000
D(GDPR(-3))	0.036872	0.005154	7.153576	0.0004
CointEq(-1)*	-0.766928	0.047686	-16.08286	0.0000
R-squared	0.986563	Mean dependent var		-0.014189
Adjusted R-squared	0.964575	S.D. dependent var		0.328356
S.E. of regression	0.061802	Akaike info criterion		-2.466400
Sum squared resid	0.042014	Schwarz criterion		-1.578975
Log likelihood	55.99599	Hannan-Quinn criter.		-2.182505
Durbin-Watson stat	2.060476			
* p-value incompatible with t-Bounds distribution.				

**Source: Author's computation EViews10**

All lagged values of the debt-to-GDP ratio (DEBTGDP) are positive and statistically significant ( $p < 0.05$ ). This indicates that previous levels of public debt have a direct and substantial impact on current fiscal sustainability. More specifically, the coefficients (0.326, 0.375, and 0.701) reveal a trend of debt persistence, where earlier debt burdens continue to affect current fiscal results. Economically, this suggests that Nigeria's fiscal framework tends to accumulate debt over time due to the continued nature of borrowing and debt servicing, which is in line with the debt persistence theory proposed by Blanchard et al. (1990).

The coefficient for the first-differenced oil revenue (OILREV) variable is  $-0.1313$ , and it is statistically significant at the 5% level ( $p = 0.0415$ ). This signifies that a 1% rise in oil revenue leads to a 0.13 percentage-point reduction in the debt-to-GDP ratio in the short term. The relationship is both negative and significant, which aligns with the prior expectation that enhanced oil revenues contribute to fiscal sustainability by reducing reliance on borrowing. This finding is consistent with Iyoha and Oriakhi (2013), who observed that shocks in oil revenue have immediate but temporary fiscal effects for Nigeria.

The short-run coefficient for the interest rate (INT) is  $+0.0119$  with a p-value of 0.0378, suggesting a positive and significant correlation between interest rates and the debt-to-GDP ratio in the short term. This implies that a 1% increase in interest rates results in roughly a 0.012 percentage-point rise in the debt ratio, supporting the theoretical notion that higher interest rates elevate debt servicing costs in the short run, thus deteriorating the fiscal balance. As the government incurs higher interest expenses on both existing and new debt, the overall debt burden escalates. Yet, as shown in the long-run model, this impact eventually reverses when elevated rates deter excessive borrowing. This finding aligns with Onwioduokit (2019) and Ezeabasili & Enyi (2017), who noted that short-term spikes in interest rates heighten debt servicing pressure prior to any stabilizing policy interventions taking effect.

The coefficient for inflation (INF) in the short run is  $-0.0158$  and is statistically significant ( $p = 0.0012$ ). This indicates that a 1% rise in inflation leads to a decrease in the debt-to-GDP ratio by about 0.016 percentage points in the short term. The negative sign suggests that increased

inflation temporarily diminishes the real value of public debt, which is referred to as the inflation tax or real debt dilution effect. Nonetheless, while moderate inflation may relieve real debt burdens, sustained inflation can jeopardize long-term fiscal credibility and elevate nominal borrowing expenses. Therefore, the short-run debt-reducing impact of inflation must be interpreted with caution. This empirical observation is consistent with Egbetunde (2012), who found that inflation has a short-run debt-eroding effect within Nigeria's fiscal environment.

The GDP growth rate coefficient (GDPR) is  $-0.0320$  and highly significant ( $p = 0.0011$ ). This indicates that a 1% rise in real GDP growth decreases the debt-to-GDP ratio by approximately 0.032 percentage points in the short term, which aligns with the expected outcomes from economic theory. This theory suggests that as the economy expands, revenues increase through higher tax collections, thus raising the denominator of the debt ratio (GDP) and strengthening the government's ability to manage debt. Consequently, economic growth immediately improves fiscal sustainability by reducing the debt burden. This finding is in agreement with the studies of Bohn (1998) and Greiner et al. (2007), who illustrated that GDP growth is vital for debt solvency and fiscal stability.

The Error Correction Term (ECT) shows a coefficient of  $-0.7670$ , which is both negative and statistically significant ( $p = 0.0000$ ). This finding is crucial as it verifies the presence of a stable long-term relationship among the variables and reflects the rate of adjustment toward equilibrium in response to short-term fluctuations. A coefficient value of  $-0.767$  indicates that approximately 76.7% of any deviation from the long-term fiscal equilibrium is rectified within one period (one year). In essence, if a fiscal imbalance arises from temporary disturbances (such as fluctuations

in oil prices or rising interest rates), the system quickly readjusts to achieve equilibrium. A rate of adjustment exceeding 50% suggests strong convergence and stability, indicating that Nigeria's fiscal system reacts swiftly to macroeconomic disturbances through policy measures like borrowing control, adjustments in expenditure, or management of exchange rates. This outcome aligns with Engle and Granger's (1987) prediction that a negative and significant ECT indicates dynamic stability and cointegration among the variables..

#### 4.4 Post-Diagnostic Tests

##### a. Serial Correlation and Heteroscedasticity Tests

Additionally, diagnostic evaluations were performed on the results of the specified model, which are presented in Table 4.8 below. The outcomes of these post-estimation tests affirm the adequacy of the ARDL model. The Breusch-Godfrey LM test shows no signs of serial correlation, with probability values for both the F-statistic and the Chi-square statistic exceeding 0.05. Likewise, the Breusch-Pagan-Godfrey test for heteroskedasticity suggests that the residuals exhibit homoskedasticity, as all test statistics remain insignificant at conventional significance levels. These findings indicate that the model is properly specified, free from significant econometric issues, and appropriate for making reliable inferences

#### RESIDUAL CORRELATION TEST

Table 4.6: Serial Correlation test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.561777	Prob. F(1,5)	0.4873

Obs*R-squared	3.030200	Prob. Chi-Square(1)	0.0817
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**Source: Author's computation EViews10,2025**

The Breusch Godfrey Serial Correlation LM test investigates whether there is a correlation among the residuals (error terms) over time in the model. The presence of serial correlation suggests that the model's errors are not independent, which could lead to biased standard errors and unreliable statistical inference. The results presented in Table 4.6 indicate that the F-statistic for the Breusch Godfrey test is 0.5618 and the p-value is 0.4873, exceeding the 5% significance threshold. Given that the p-value ( $0.4873 > 0.05$ ), we do not reject the null hypothesis of no serial correlation. This indicates that the residuals are independent across time, suggesting that the model is free from issues of autocorrelation. Therefore, the explanatory variables in the ARDL-ECM effectively capture the time-series behavior of fiscal sustainability in Nigeria. There are no systematic unaccounted patterns in the residuals, which strengthens the reliability of the model's estimates and forecasts. This conclusion is consistent with the findings of Gujarati & Porter (2009) and Wooldridge (2012), who argue that the absence of serial correlation is a beneficial characteristic in time-series models, as it guarantees that OLS estimators remain efficient and that the t-statistics are valid.

## HETEROSKEDASTICITY TEST

**Table 4.7: Heteroskedasticity test**

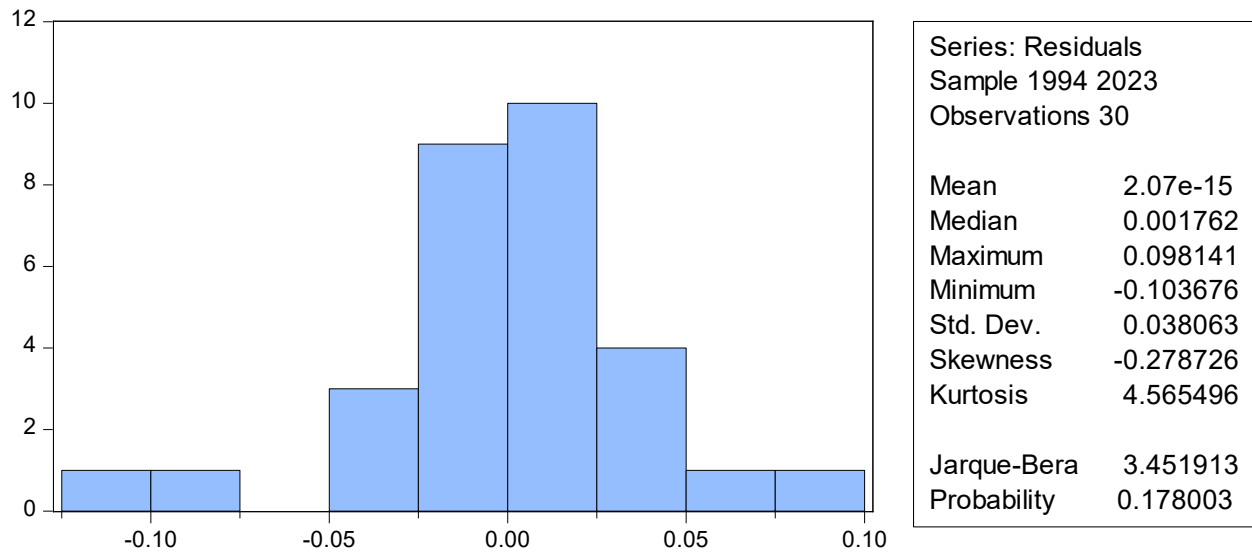
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.784882	Prob. F(23,6)	0.6923
Obs*R-squared	22.51631	Prob. Chi-Square(23)	0.4893

**Source: Author's computation EViews10,2025**

The Breusch–Pagan–Godfrey test was used to check whether the variance of the residuals remains constant across observations. The test shows that the F-statistic for the Breusch Pagan Godfrey test is 0.7849 with a p-value of 0.6923, which is greater than the 5% level of significance. Since the p-value ( $0.6923 > 0.05$ ), we fail to reject the null hypothesis of homoskedasticity, meaning that the residuals have constant variance. This implies that the model is free from heteroskedasticity and the standard errors of the estimates are efficient and consistent. Hence, the t-statistics and F-statistics obtained from the model are valid for hypothesis testing. It suggests that the behaviour of the error terms is stable across different levels of fiscal indicators large and small values of debt, growth, or inflation produce residuals of roughly the same dispersion. The result is consistent with Greene (2012) and Kennedy (2008), who emphasize that homoskedastic residuals strengthen the reliability of regression estimates.

#### **b. Jarque Bera Normality Test**

NORMALITY TEST



**Figure 4.1 Normality Distribution**

**Source: Author's Computation, 2025.**

The Jarque–Bera (JB) test was conducted to assess whether the model's residuals adhere to a normal distribution. This test evaluates the skewness and kurtosis of the residuals in comparison to those of a normal distribution. The results indicate a Jarque Bera statistic of 3.4519 and a p-value of 0.1780, which exceeds the 5% significance threshold. Given that the p-value ( $0.1780 > 0.05$ ) is higher than 0.05, we fail to reject the null hypothesis, suggesting that the residuals are normally distributed. This indicates that the error terms exhibit a normal distribution, thereby fulfilling another critical assumption of OLS. Practically, this implies that the model's prediction errors are randomly distributed without any systematic bias or distortion, rendering the model appropriate for policy analysis and forecasting.

#### **4.5 Discussion of findings**

The results indicate that oil revenue exhibits a negative and statistically significant correlation with the debt-to-GDP ratio in both the short term and long term. This suggests that an increase in oil revenue enhances Nigeria's fiscal sustainability by lessening reliance on debt. Such an outcome aligns with the fiscal resource theory, which asserts that the capacity for government revenue is crucial for debt solvency. Elevated oil earnings boost public revenue, strengthen the capacity to service debt, and diminish borrowing requirements. This finding is consistent with the research of Iyoha and Oriakhi (2013), who demonstrated that oil windfalls alleviate fiscal deficits and bolster macroeconomic stability in Nigeria. Likewise, Adedokun (2018) and Olawumi and Ayinla (2020) discovered that variations in oil revenue significantly influence Nigeria's debt profile. This indicates that Nigeria's fiscal sustainability continues to be heavily reliant on the performance of the oil sector, highlighting the urgent need for revenue source diversification.

#### Interest Rate and Fiscal Sustainability

The research revealed that the interest rate exerts a negative and significant impact in the long run, while showing a positive and significant effect in the short run. This contrasting behavior suggests that higher interest rates increase borrowing expenses and exacerbate the debt burden in the short term; however, over time, sustained high rates promote fiscal discipline by discouraging excessive borrowing. This finding aligns with the monetary-fiscal interaction theory, which posits that initial monetary tightening may worsen debt service expenses, but ultimately fosters long-term fiscal discipline. It supports the conclusions drawn by Ajayi and Omotosho (2019), who noted that restrictive monetary policies enhance long-run fiscal sustainability in developing nations. In the context of Nigeria, the findings imply that effective

interest rate management can act as a form of indirect fiscal control, encouraging debt sustainability through a reduction in public sector borrowing.

### Inflation and Fiscal Sustainability

In the long term, inflation shows a weak negative relationship with the debt-to-GDP ratio, while in the short term, it displays mixed yet significant effects. This implies that moderate inflation can temporarily decrease the real value of existing debt (debt erosion effect), but ongoing inflation ultimately threatens fiscal stability due to increased nominal interest payments and lowered real revenue. This complex relationship underscores the multifaceted role of inflation in fiscal dynamics. These findings corroborate the work of Egbetunde (2012), who determined that inflation's effect on fiscal sustainability in Nigeria is unstable and statistically insignificant, primarily due to the counteracting influences of nominal and real factors.

In practical terms, this suggests that maintaining price stability is essential for long-term fiscal health, as inflation volatility creates uncertainties in debt management and public budget planning.

### Economic Growth and Fiscal Sustainability

The long-term coefficient for the GDP growth rate is negative and statistically significant, confirming that higher economic growth positively impacts fiscal sustainability by lowering the debt-to-GDP ratio. This supports the debt-growth sustainability hypothesis articulated by Bohn (1998) and Barro (1990), which posits that an economy can maintain its debt levels if fiscal measures effectively respond to debt increase, and growth expands the revenue base. These results indicate that robust and consistent economic growth in Nigeria will strengthen the government's ability to manage debt and minimize fiscal risk. The short-term positive impact

observed in the model indicates that, during growth periods, borrowing may temporarily rise to fund growth-oriented projects, but the long-term advantages of growth outweigh the short-term borrowing consequences. This finding aligns with the conclusions of Obi and Nurudeen (2020) and Ogunmuyiwa (2011), who also identified GDP growth as a key variable in understanding fiscal sustainability in Nigeria.

#### Error Correction Mechanism and Model Stability

The Error Correction Term ( $-0.7669$ ) was both negative and statistically significant, indicating that there is a stable long-term relationship between the variables. This coefficient suggests that approximately 76.7% of any divergence from the long-term equilibrium is rectified within a year. The rapid adjustment rate shows that fiscal imbalances in Nigeria are temporary and that the economy relatively quickly returns to its sustainable debt path after experiencing shocks. The strong  $R^2$  (0.9865) and the Durbin-Watson statistic (2.06) further support the reliability and goodness of fit of the estimated ARDL model, confirming that the identified relationships are statistically robust and economically relevant.

#### 5.3 Recommendations

In light of the findings, the study offers the following policy suggestions:

1. Broaden revenue sources beyond oil

Nigeria's fiscal sustainability is significantly exposed to fluctuations in oil prices. The government ought to diversify its revenue streams by increasing non-oil exports, improving tax administration, and fostering growth in both industrial and agricultural sectors.

2. Foster a fiscal policy that enhances growth

Fiscal policy should aim to encourage sustainable economic growth through investments in infrastructure, development of human capital, and fostering innovation. A growth-oriented revenue increase will enhance the capacity to service debt and bolster fiscal resilience.

### 3. Harmonize monetary and fiscal policies

The Central Bank of Nigeria (CBN) and the Ministry of Finance should ensure that interest rate policies are in sync with debt management strategies. This coordination can help prevent spikes in borrowing costs and ensure that debt is allocated toward productive uses rather than recurrent expenditures.

### 4. Ensure price stability

Controlling inflation should remain a primary macroeconomic goal. The CBN needs to reinforce monetary discipline to maintain inflation within a stable range, thereby supporting debt servicing while preserving fiscal credibility.

### 5. Establish fiscal rules and ensure transparency

The government should implement robust fiscal-responsibility frameworks that restrict borrowing to productive investments. Transparent reporting of debt and revenue information will improve investor confidence and accountability.



## CHAPTER FIVE

### 5.1 Summary of Findings

The Augmented Dickey–Fuller (ADF) unit-root test indicated that the variables exhibit mixed orders of integration — INDEBTGDP (debt-to-GDP), INT (interest rate), and GDPR (GDP growth rate) were stationary at their level (I(0)), whereas INOILREV (oil revenue) and INF (inflation rate) became stationary only after being first differenced (I(1)). This blend of integration orders supported the application of the ARDL estimation method.

The ARDL bounds test affirmed the presence of a long-term cointegrating relationship between fiscal sustainability and its drivers, as the calculated F-statistic (23.514) surpassed the critical upper bound at the 5% significance level. This suggests that fiscal sustainability in Nigeria is closely linked to macroeconomic fundamentals over time.

Long-run results indicated that:

Oil revenue (INOILREV) negatively and significantly influences the debt-to-GDP ratio, suggesting that increased oil revenues enhance fiscal sustainability. The interest rate (INT) similarly showed a negative and significant impact, indicating that over the long term, higher borrowing costs lead to stricter fiscal discipline and lower levels of debt accumulation. The inflation rate (INF) reflected a negative but statistically insignificant effect on fiscal sustainability, implying that while inflation may diminish the real value of debt, its long-term impact remains weak. The GDP growth rate (GDPR) displayed a negative and statistically significant long-run association with the debt-to-GDP ratio, confirming that stronger economic growth bolsters fiscal sustainability.

Short-run results from the Error Correction Model (ECM) revealed that:

Changes in oil revenue in the short run negatively and significantly affect the debt-to-GDP ratio, indicating that rising oil income immediately alleviates borrowing pressures. Short-run increases in the interest rate had a positive and significant influence, suggesting that higher borrowing costs temporarily escalate fiscal challenges before stabilizing in the long term. Short-run inflation exhibited a positive and significant effect, indicating that increasing prices temporarily heighten nominal debt servicing pressures.

Growth in GDP in the short run positively and significantly impacted the debt-to-GDP ratio, reflecting that periods of expansion may lead to increased fiscal borrowing before the longer-term benefits are realized.

The error correction term ( $-0.7669$ ) was negative and significant, demonstrating that approximately 76.7% of deviations from long-run equilibrium are corrected yearly, reinforcing the presence of a rapid adjustment mechanism.

Diagnostic assessments affirmed the model's dependability: absence of serial correlation ( $p = 0.4873$ ), no heteroskedasticity ( $p = 0.6923$ ), and residuals that are normally distributed (Jarque–Bera  $p = 0.1780$ ). These findings validate the specification and estimation of the ARDL-ECM model.

## **5.2 Conclusion**

The results highlight that Nigeria's fiscal sustainability is substantially affected by macroeconomic fundamentals — particularly oil revenue, interest rate trends, and economic growth. The negative and significant link between oil revenue and the debt-to-GDP ratio affirms

that the fiscal stability of Nigeria is significantly reliant on the performance of the oil sector, in line with resource-dependence theory (Oriakhi & Iyoha, 2013). The long-term negative correlation between GDP growth and public debt supports the fiscal sustainability theory (Bohn, 1998), which suggests that sustained economic expansion enhances a government's ability to service its debt. The varying effects of interest rate in the short and long run emphasize the necessity of coordination between monetary and fiscal policy: while short-term increases in interest rates increase debt burdens due to elevated servicing costs, they promote discipline in the long run by reducing borrowing appetites.

Although the long-run effect of inflation is minimal, its short-term implications indicate that maintaining price stability is essential for debt sustainability, as rising inflation undermines real revenue and complicates debt servicing (Egbetunde, 2012).

In summary, the study concludes that oil revenue, economic growth, and interest rate management are the most critical long-term determinants of fiscal sustainability in Nigeria. Achieving fiscal stability, therefore, necessitates sustained growth, diversified revenue sources, judicious borrowing, and well-coordinated monetary and fiscal policy.

### **5.3 Recommendation**

1. **Broaden Revenue Sources:** The government ought to widen its revenue base beyond oil by enhancing tax collection, encouraging non-oil exports, and fostering value-added production within agriculture and manufacturing (Okon & Edet, 2020).

2. **Cautious Management of Oil Income:** Oil revenues should be managed transparently and directed towards productive sectors that generate sustainable income, rather than for recurrent

expenses. The establishment of effective sovereign wealth and stabilization funds can help mitigate external shocks (IMF, 2022).

3. Encourage Sustainable Economic Growth: Fiscal and monetary authorities need to work together to implement policies that encourage long-term growth via infrastructure investment, education, and technology enhancement. Growth aids in lowering the debt-to-GDP ratio by broadening the productive base (Akinwunmi, 2021).

4. Effective Debt Management: Funds raised through borrowing must be allocated solely to capital projects that provide measurable economic benefits. The Debt Management Office (DMO) should improve transparency and public reporting regarding debt usage (CBN, 2023).

5. Ensure Macroeconomic Stability: The Central Bank should strive to maintain moderate and consistent interest and inflation rates, as fluctuations in these indicators elevate debt servicing costs and jeopardize fiscal stability (Adebayo, 2019).

6. Enhance Fiscal Institutions: The government should strengthen frameworks for fiscal responsibility and anti-corruption to ensure accountability in borrowing and spending decisions (World Bank, 2023).

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