PUBLIC DEBT AND INVESTMENT IN NIGERIA

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CERTIFICATION

We certify that this work titled, **"Public Debt and Investment in Nigeria"** was carried out by **ONYEKACHUKWU AUSTIN OBINNA** with matriculation number **SSC2105586** in the Department of Economics, Faculty of Social Sciences, University of Benin, Benin City, Edo State.

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DEDICATION

This work is dedicated to firstly Almighty God who gave me strength and wisdom to start and see this project work through to the end. I also dedicate this work to my family who gave their unwavering support through out my whole university education.

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Table of Contents

ABSTRACT

This study examines the effect of public debt on investment in Nigeria from 1981 to 2023. The study focuses on how domestic and external borrowings influence gross fixed capital formation, which represents investment performance. Annual data were sourced from the Central Bank of Nigeria, Debt Management Office, World Bank, and National Bureau of Statistics. The Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM) techniques were applied to capture both short-run and long-run relationships among the variables, supported by standard diagnostic tests for reliability and consistency.

The findings reveal that both domestic and external debts exert a negative and significant impact on investment in Nigeria. Inflation, interest rate, and exchange rate volatility were also found to weaken investment performance. The results suggest that rising public debt has not been effectively used to stimulate productive investment, as debt servicing continues to consume a large portion of government revenue. The study recommends prudent borrowing, improved debt management, and channelling of borrowed funds into productive sectors to enhance sustainable investment growth in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Preamble

Public debt has become a critical macroeconomic issue for developing economies, particularly Nigeria, as it strives to achieve sustainable economic growth and development. The role of government borrowing, whether from domestic or external sources, in financing investments to stimulate economic activities has generated intense debate in policy and academic circles (Iyoha, 2000; Okafor & Eboh, 2021).

The role of public debt in shaping economic performance and investment dynamics cannot be overemphasized, especially in developing economies like Nigeria. Public debt refers to the total financial obligations of the government, arising from both internal (domestic) and external (foreign) borrowings, which are used to finance deficits when government revenue falls short of expenditure. In theory, debt accumulation is often justified as a means of bridging fiscal gaps, stimulating economic growth, and promoting infrastructural development. However, the efficiency of debt in achieving these goals depends on the ability of the borrowed funds to finance productive investment rather than recurrent consumption.

Since independence, and more prominently from 1981 to 2023, Nigeria has relied heavily on public borrowing to finance budget deficits. Government budgets may take the form of surplus, deficit, or balanced positions. A balanced budget occurs when projected government revenue equals proposed expenditure, while a surplus budget arises when revenue exceeds expenditure. In contrast, a deficit budget occurs when proposed expenditure surpasses expected revenue, thereby compelling governments to resort to debt financing. As Adeoye (2006) observed, fiscal deficits often emerge because government spending, which grows flexibly with rising developmental needs, tends to surpass government revenue, which grows relatively rigidly. To close this financing gap, Nigeria has consistently relied on a mix of domestic borrowing from banks, private institutions, and the issuance of bonds, as well as external loans from multilateral agencies such as the International Monetary Fund (IMF), the World Bank, and bilateral creditors.

The historical trajectory of Nigeria's debt profile underscores the magnitude of the challenge. In the early 1980s, external shocks such as the collapse in global oil prices triggered mounting fiscal imbalances. Nigeria's external debt stock rose from US $8.9 billion in 1980 to about US $19 billion by 1986, and further to US $35.9 billion by 1991, with a debt-to-GDP ratio approaching 75% (World Bank, 2022). Servicing these debts became a burden, diverting scarce resources away from capital projects into recurrent expenditures. This period also witnessed a decline in domestic investment, as both government and private investors faced liquidity constraints.

The mid-2000s marked a turning point when Nigeria secured significant debt relief from the Paris Club of creditors in 2005, reducing external debt stock by approximately US $30 billion. This debt relief created fiscal space, enabling renewed investments in infrastructure, social services, and the financial sector (CBN, 2010). However, the reprieve was short-lived. With declining oil revenues, widening fiscal deficits, and rising expenditure commitments, Nigeria once again turned to borrowing, leading to a resurgence in debt accumulation in the 2010s and 2020s.

By 2021, the country's total public debt had surged to ₦38 trillion, and debt servicing accounted for a staggering 76.2% of government revenue (Debt Management Office, 2022). This trend intensified in 2023, with public debt standing at ₦97.34 trillion (≈ US $108.23 billion), of which domestic debt constituted 63.6% and external debt 36.4% (NBS, 2023). Though Nigeria's debt-to-GDP ratio remained relatively modest at 28.3% in 2023, the overwhelming pressure of debt servicing severely constrained fiscal capacity, thereby limiting government expenditure on productive investments.

On the investment side, both domestic investment and foreign direct investment (FDI) have witnessed disturbing declines. Foreign direct investment, which peaked at about US $4.7 billion in 2008, fell drastically to only US $468 million in 2022 (UNCTAD, 2023). Similarly, total foreign investment dropped from US $23.99 billion in 2019 to US $5.33 billion in 2022 (CBN, 2023). This investment drought is partly linked to Nigeria's mounting debt obligations, macroeconomic instability, exchange rate volatility, and structural bottlenecks that have dampened investor confidence. Several empirical studies covering the Nigerian economy between 1981 and 2021 show that both external and domestic debts exert a negative impact on private investment, as resources are diverted from capital formation to debt servicing (ResearchGate, 2022; RSIS, 2021). The theoretical underpinnings of this phenomenon are rooted in the Keynesian framework, which argues that government borrowing and spending can stimulate aggregate demand, increase investment, and reduce unemployment, particularly during economic downturns (Keynes, 1936). However, when debt accumulation is excessive and disproportionately channeled toward recurrent rather than capital expenditure, it creates a "crowding out" effect. This occurs when rising government borrowing increases interest rates, making it more costly for the private sector to access credit, thereby discouraging investment. Thus, while moderate levels of public borrowing can stimulate economic activity, excessive debt accumulation without productive returns becomes counterproductive.

In the Nigerian context, public debt has emerged as a double-edged sword. On one hand, it provides necessary funding for infrastructural development, public sector investment, and budgetary support. On the other hand, the rising cost of servicing the debt reduces fiscal space for investment in critical sectors such as health, education, and power, while also crowding out private sector financing. This paradox highlights the need for prudent debt management and investment-focused borrowing.

This study will serve as an eye-opener to the government, policy makers, and other stakeholders in the Nigerian economy on the impact public debts have on the overall investment position of the country. It will help them see the need to formulate appropriate policies relating to the effective and optimal use of public debts and effectively implementing these policies and those already in place. This study will also contribute it's quota to the existing literature thereby, expanding the frontier of knowledge on the relationship between Public debts and investment in Nigeria.

1.2 Statement of the Research Problem

The Nigerian economy has long grappled with structural challenges such as mismanagement of public funds, corruption, poor fiscal discipline, and inadequate policy coordination (Solawon & Adekunle, 2018). These challenges have contributed significantly to the country's rising public debt burden over the years. Public debt, both domestic and external, has increasingly become a central feature of Nigeria's fiscal profile, raising concerns about its implications for sustainable economic development, particularly investment performance.

According to Nwanna & Umeh (2015), excessive accumulation of external debt as a financing tool can have adverse effects on economic performance, primarily by crowding out private investment through rising interest rates and debt overhang. Nkalu (2015) similarly argues that "persistent fiscal imbalances have triggered debt accumulation in developing economies like Nigeria, leading to increased debt servicing obligations and limited fiscal space for productive investment."

In Nigeria, the rising stock of public debt especially in recent decades has been accompanied by significant increases in debt servicing expenditures. This situation potentially diverts resources away from critical investment in infrastructure, education, healthcare, and other productive sectors that drive long-term economic growth. As debt servicing consumes a growing share of government revenue, it limits the government's ability to finance public investment that could stimulate private sector participation and overall economic development.

Although debt is traditionally used as a tool to stimulate growth and investment, the persistent growth in Nigeria's debt profile without a commensurate improvement in investment indicators raises questions about the efficiency and sustainability of current debt management practices. Furthermore, the relationship between public debt and investment in Nigeria has produced mixed empirical results in the literature. For example, Nwanna & Umeh (2019) find a negative relationship between external debt and economic growth. Ndukwe (2015) reports a non-significant relationship between fiscal indicators and investment, while Oluwafadeke & Ogundipe (2018) suggest that macroeconomic stability including inflation and openness—plays a critical role in investment outcomes.

Given these contradictions and the continued expansion of Nigeria's debt portfolio, this study aims to investigate the empirical relationship between public debt and investment in Nigeria. It will also consider key macroeconomic variables such as interest rates and inflation, which influence investment decisions. By doing so, the study seeks to contribute to a deeper understanding of how public debt dynamics affect investment patterns in Nigeria's economy.

1.3 Research Questions

The study seeks to address the following research questions:

i. Does public debts have a significant impact on investment in Nigeria?

ii. What is the effect of domestic debts on investment in Nigeria?

iii. What is the effect of external debts on investment in Nigeria?

iv. To what extent does debt servicing affect the level of investment in Nigeria?

1.4 Objectives of the Study

The broad objective of this study is to examine the impact of public debt on investment in Nigeria. The specific objectives are to:

1. Examine the impact of public debt on investment in Nigeria.
2. Investigate the effect of domestic debt on investment in Nigeria.
3. Assess the effect of external debt on investment in Nigeria.
4. Analyze how debt servicing influences investment in Nigeria.

1.5 Hypotheses of the Study

i. There is no significant relationship between public debts and investments in. Nigeria.

ii. There is no significant relationship between domestic debts and investment in Nigeria.

iii.There is no significant relationship between external debt and investment in Nigeria.

iv. There is no significant relationship between debt servicing and investment in Nigeria.

1.6 Scope of the Study

The study covers the period of 1981-2023 in examining the impact of public debt and investment in Nigeria using data from reliable Secondary Sources such as the Central Bank Statistical Bulletin. This period was selected because it covers the year Nigeria adopted the Structural adjustment program in its pursuit to adjust to the failing Oil prices and opted for foreign aid in the management of its economy , the terminal year 2023 was chosen because was the most current available year for data Sourcing.

1.7 Significance of the Study

This study is significant for several reasons. Firstly, it contributes to academic literature by exploring the relationship between public debt and investment in Nigeria using current data and updated econometric techniques. By focusing on both domestic and external debt alongside debt servicing, the study provides a clearer understanding of how different debt components influence investment levels.

Secondly, the study offers practical insights for policymakers, particularly the Debt Management Office (DMO), Ministry of Finance, and Central Bank of Nigeria (CBN), by examining whether rising public debt encourages or crowds out investment. These findings can inform debt sustainability frameworks and investment-friendly fiscal policies.In addition, the study will benefit investors and development partners by providing an empirical basis for assessing Nigeria's macroeconomic environment. Understanding the impact of debt on investment will help shape lending decisions, project planning, and public-private partnerships.

This study supports national development by addressing how government borrowing can be optimized to foster productive investment, thereby contributing to economic growth, job creation, and infrastructure development.

The findings of this study will provide empirical evidence on the effectiveness of public debt in stimulating investment in Nigeria. Policymakers will benefit from insights on debt management strategies that can enhance economic growth while avoiding debt distress. It will also serve as a resource for researchers, economists, and students seeking to understand the dynamics of public debt and investment in developing economies.

1.8 Limitations of the Study

This study uses secondary data from the central bank of Nigeria statistical bulletin for the period 1981-2023(42 years). The reliability of the data is one of the constrain of the study due to the poor record keeping of statistical institutions in Nigeria. Another constrain is time constrain as the research work was done alongside academic work during the time of the study, the funding of the research was done within the limits of the resources available to the researcher given the escalating level of prices currently in the Nigerian Economy.

1.9 Structure of the Study

The study is subdivided into six chapters, the first chapter introduces the study with subheadings including the preamble, research questions, objectives of the study, scope of the study,significance of the study as well as the limitations of the study and chapter two the background to the study. The chapter three deals with the literature review of salient research work, it includes conceptual review, theoretical literature and empirical literature review while chapter three which shows the methodology used in the study covers theoretical framework of study, model specification and the method of data analysis adopted for the research work. Chapter five captures the presentation and discussion of empirical results as well as policy implication of findings and lastly chapter six is the summary of findings, conclusion and recommendations made from the research study.

CHAPTER TWO

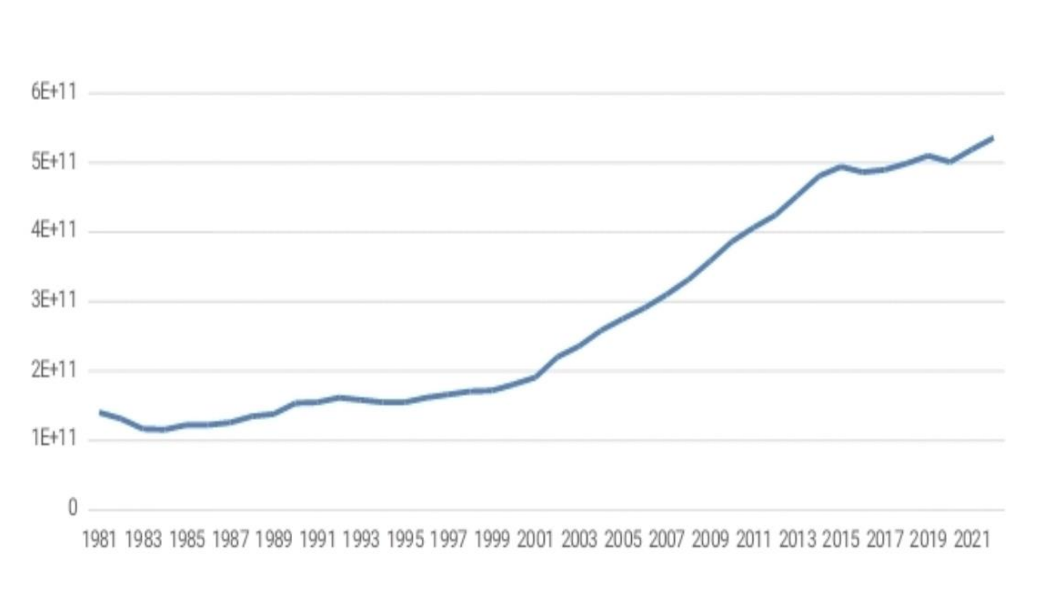
BACKGROUND TO THE STUDY

2.1 Introduction

This chapter is going to be looking at the study environment, trends involved in the health expenditure of Nigeria and it will also give appraisal backed up with statistical claims.

2.2 Study Environment

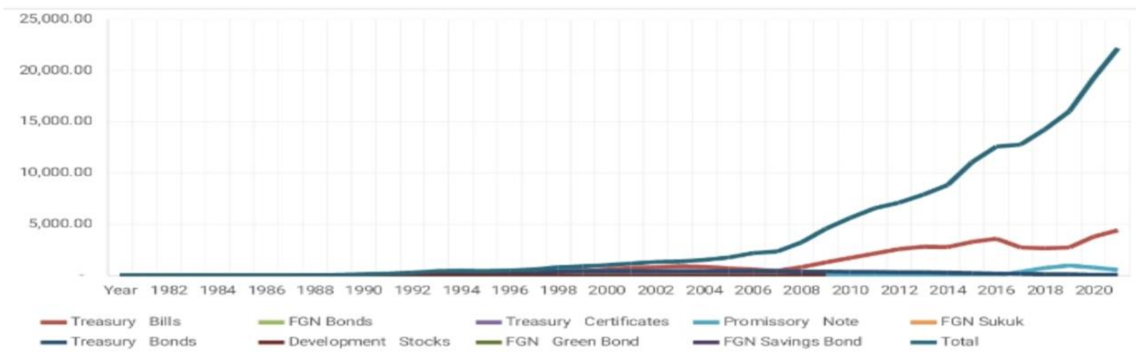
Fig 2.2.1 Graph showing the trend of Real Gross Domestic Product in Nigeria from 1981 - 2021



Source: World Bank (2021)

(The line graph represents real GDP overtime from 1981-2021 and below are some analyses of the trend; (Overall Growth trend- the graph shows a steady upward trend over the decades, indicating consistent economic growth, the GDP appears relatively stable from 1981-1995 with slight fluctuations, suggesting slow economic growth and around the mid 1990's the GDP growth rate increased significantly continuing its upward trajectory up till 2014.Around 2014-2018, there is a plateau in GDP growth during this period, this is however attributed to the downturns in the economy possibly contributed to by the global financial crisis and other domestic challenges like political instability, after the downturn GDP resumed its growth trajectory indicating economic recovery).

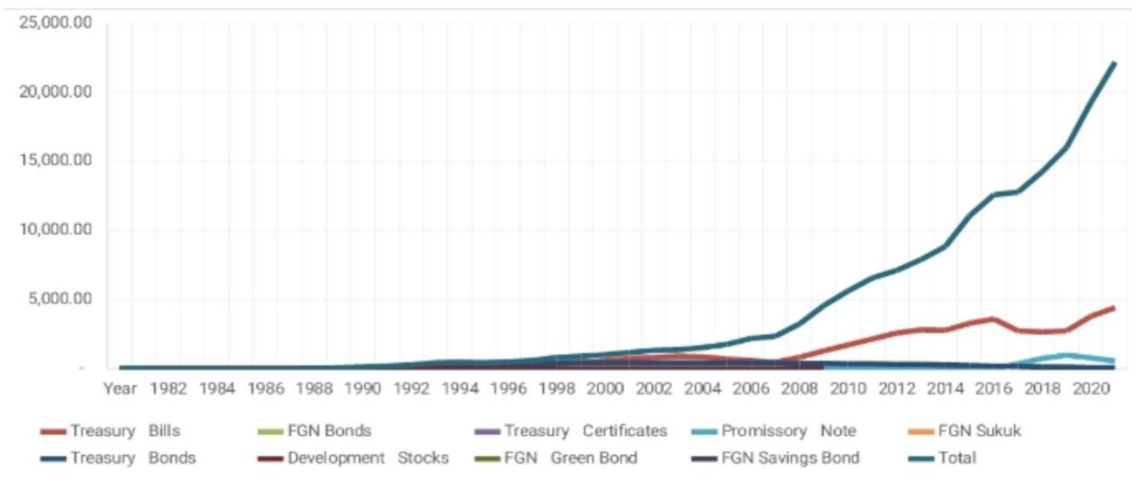
Fig 2.2.3 Graph showing the Domestic Debt in Nigeria



Source: Central Bank of Nigeria (2020)

(The total domestic debt has experienced a consistent upward trend from 1998 to 2022, indicating a significant increase in the government's borrowing to finance its expenditures, however the majority of the debt is represented by Treasury Bills, suggesting that the government has relied heavily on short-term borrowing to meet its immediate financial needs. While Treasury Bills have been the primary instrument, other debt instruments like FGN Bonds, Promissory Notes, and Savings Bonds have also seen growth over the years, indicating a diversification of the government's funding sources. A major concern however is that a growing debt burden can lead to higher interest payments, which can strain government budgets and potentially crowd out other essential expenditures together with the fact that the interest rates on different debt instruments will affect the cost of servicing the debt. Comparing the debt level to the country's Gross Domestic Product (GDP) can provide a better perspective on the sustainability of the debt).

Fig 2.2.4 Graph showing the External Debt in Nigeria



Source: Central Bank of Nigeria (2022)

Analysis of Nigeria's Public External Debt Outstanding

(The total public external debt has experienced a substantial increase over the period depicted, particularly from 2010 onwards and this indicates a growing reliance on external financing to support the country's development. Multilateral loans can be observed to be the primary source of external debt, suggesting that Nigeria has relied heavily on international financial institutions like the World Bank and the International Monetary Fund, also there has been a notable increase in Promissory Notes and Diaspora Bonds, indicating that the government has been tapping into diverse sources of financing, including domestic and foreign investors, while the levels of Paris Club debt, Euro Bonds, Bilateral debt, and others have experienced fluctuations over the years, reflecting changing economic conditions and borrowing strategies).

The impact can be explained as follows,

(A growing debt burden can leading to higher interest payments, which can strain government budgets and potentially crowd out other essential expenditures to solve this the government needs to carefully manage its debt levels to ensure that it can meet its obligations without compromising its financial stability because high levels of debt can hinder economic growth by diverting resources from productive investments. A significant portion of Nigeria's external debt is denominated in foreign currencies, which exposes the country to exchange rate risks Debt-to-GDP Ratio: Comparing the debt level to the country's Gross Domestic Product (GDP) can however provide a better perspective on the sustainability of the debt).

2.3 Stylized facts

Nigeria's reliance on budget deficit financing dates back to the colonial era (1899–1959), when deficits supported infrastructure and public services. From the 1980s onward, deficits became a recurring feature, financed through domestic and external borrowing leading to rising public debt. In 1986, Nigeria adopted the IMF-backed Structural Adjustment Program during the oil crisis, reinforcing deficit financing as a tool for economic stabilization and investment

Between 1980 and 1994, Nigeria struggled with recurring fiscal imbalances as deficits remained a dominant feature of government finance. The situation reached its peak in 1982 with a record –12.44% of GDP, reflecting weak revenue mobilization and rising expenditure pressures. Although a modest surplus of 1.19% was achieved in 1996, it proved unsustainable as fiscal pressures soon resurfaced. A relative improvement came between 2003 and 2006, when deficits narrowed to between –2.0% and –0.6%, creating some fiscal space that supported moderate investment growth, largely driven by favourable oil earnings and tighter fiscal discipline.

The 2008 global financial crisis severely strained Nigeria's fiscal position as falling oil prices reduced revenue while expenditure pressures increased. A small surplus of about 0.3% of GDP in 2008 quickly turned into a large deficit of –10.4% in 2009, forcing renewed borrowing. Although higher oil earnings in 2010 helped narrow the deficit to about ₦1.105 trillion (3.7% of GDP), fiscal imbalances persisted. By 2011, the shortfall declined to ₦1.136 trillion (2.96% of GDP), with IMF data even suggesting a slight surplus of 0.7%, but by 2012 the budget still projected a deficit of roughly 2.77% of GDP. This period highlighted Nigeria's vulnerability to external shocks and its continued reliance on debt financing to sustain expenditure.

From 2013 onward, Nigeria's fiscal position continued to deteriorate as expenditure consistently outpaced revenue growth. In 2013, the deficit stood at ₦1.32 trillion (1.8% of GDP), reflecting rising recurrent spending and weak non-oil revenue mobilization. The situation worsened over the following years, particularly with the oil price collapse of 2014–2016 and the COVID-19 pandemic shock in 2020, which further constrained revenue while expenditure needs expanded. By 2021, the deficit had risen sharply to ₦2.65 trillion, and in 2022 it remained high at ₦2.57 trillion, underscoring the country's increasing dependence on borrowing to finance fiscal gaps. This persistent imbalance during 2013–2022 highlighted Nigeria's structural revenue weakness and the growing burden of debt servicing, which reduced the fiscal space for productive investment.

By 2023, Nigeria's fiscal deficit widened significantly to about ₦13.5 trillion (≈5.0% of GDP), driven by sluggish revenue growth in the face of escalating government expenditure. A major concern was the rising cost of debt servicing, which consumed about ₦8.56 trillion, leaving only ₦4.49 trillion for capital investment. This imbalance underscored the crowding-out effect, where resources that could have supported infrastructure and productive investment were instead channeled toward debt repayment. Consequently, by the close of 2023, the country's total public debt stock had surged to ₦97.34 trillion, reflecting Nigeria's increasing reliance on borrowing to finance fiscal gaps and sustain public investment. This trend highlights the deepening challenge of fiscal sustainability and the urgent need for stronger revenue mobilization strategies.

2.4 Appraisal of the nexus between Public Debts and Investment in Nigeria

The relationship between public debt and investment is a critical issue for emerging economies like Nigeria. Public debt, when appropriately utilized, can support infrastructure and productive investment. However, excessive debt and unsustainable debt servicing can crowd out essential investments, reduce investor confidence, and slow economic development.

Public debt has played a significant role in capital accumulation and infrastructure development. For example, Nigeria's poverty rate declined from 40.1% in 2020 to 37.1% in 2022 (Source:

National Bureau of Statistics,2020), suggesting some level of improvement in welfare partly due to public investment funded through borrowing. Similarly, foreign direct investment (FDI) increased from $1.02 billion in 2020 to $1.73 billion in 2022 (Source: Nigerian Investment Promotion Commission,2022), reflecting improved investor confidence possibly supported by debt-financed infrastructure upgrades.

In line with Keynesian economics, public debt especially when channeled into productive sectors can stimulate economic growth. Nigeria's manufacturing sector grew by 3.4% in 2022, up from 2.5% in 2020, while the agricultural sector expanded from 1.8% to 2.3% over the same period (Source: National Bureau of Statistics,2023). These gains suggest that government borrowing may have been effectively deployed in sectors with high employment and output potential.

However, the increasing reliance on debt has also produced adverse effects. Nigeria's debt-to-GDP ratio climbed from 21.6% in 2020 to approximately 40.2% by 2023, reflecting the scale of borrowing (Source: Debt Management Office, Nigeria,2023). This surge has raised concerns about debt sustainability, particularly as debt servicing consumes a growing share of government revenue.

The headline inflation rate rose from 15.7% in December 2020 to 22.2% by December 2023, reflecting persistent price pressures that undermine real income and erode the returns on both domestic and foreign investment (National Bureau of Statistics, 2021; 2024). This sustained uptick has been partly attributed to deficit monetization, as the Central Bank of Nigeria's overdrafts to the Federal Government surged, peaking at approximately ₦29.3 trillion in mid-2023, thereby expanding money supply and fueling demand-pull inflation. At the same time, structural supply-side constraints notably in energy and infrastructure have compounded the problem. For example, the national power sector operates at only about one-third of its installed 13,500 MW capacity, resulting in frequent outages and an estimated US$29 billion in annual economic losses. These dynamics limit the developmental impact of debt-financed public investment, as rising inflation not only weakens household purchasing power but also deters long-term private capital formation. Moreover, capital expenditure as a proportion of total government spending has shown a downward trend, falling from 23.5% in 2020 to about 18.5% in 2023 (Source: Budget Office of the Federation,2024). This indicates a shift toward recurrent spending, which may weaken the long-term productivity of debt-financed investments.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

The review of important literature works conceptually, empirically, and theoretically is essential to lay a solid foundation for any meaningful investigation, especially a study such as this. This scholarly review of literature provides direction and depth for the study, situating it within the broader academic discourse and advancing knowledge in this subject area.

3.2 Conceptual Literature Review

3.2.1 Public Debt.

Public deb refers to the accumulation of financial obligations owed by the government to individuals, institutions, and foreign entities as a result of borrowing to cover fiscal deficits and support public investment. It includes both domestic debt, contracted within the country through instruments such as treasury bills, bonds, and development stocks, and external debt, owed to foreign creditors such as international financial institutions, bilateral partners, and global capital markets (Iyoha, 2021; World Bank, 2022). According to CBN (2023), public debt represents the difference between government expenditure and revenue, when the revenue is insufficient, thereby necessitating borrowing to finance infrastructure, social services, and other developmental projects.

3.2.2. Domestic /Internal Debt

Domestic debt refers to government borrowings from internal sources, including treasury bills, government bonds, and loans from domestic financial institutions. It is often considered less risky compared to external debt since it is denominated in local currency and not subject to exchange rate fluctuations (Ezeabasili & Nwakoby, 2013). However, excessive reliance on domestic borrowing can crowd out private sector access to credit, raise interest rates, and undermine private investment (Apere, 2014). In Nigeria, the share of domestic debt in total public debt has steadily risen, reflecting government preference for local financing as a hedge against external shocks.

3.2.3 External Debt

External debt refers to borrowings from foreign governments, multilateral institutions, and international private lenders. While it provides access to larger pools of foreign exchange and concessional financing, it exposes the economy to risks associated with exchange rate depreciation and balance-of-payment crises (Clements, Bhattacharya & Nguyen, 2003). Nigeria's historical debt crisis of the 1980s and 1990s epitomized the dangers of unsustainable external borrowing, culminating in the 2005 debt relief initiative by the Paris Club. In recent years, Nigeria has increasingly relied on Eurobonds and multilateral loans, rekindling concerns about external vulnerability and debt sustainability

3.2.4 Debt Restructuring

: this simply means that the outstanding debts are converted into other types of debts for example debt rescheduling, refinancing, buy –back, debt conversion.

a) Debt Rescheduling: debt rescheduling involves the postponement of the effective maturing dates of debt owed to a future date.

b) Debt Conversion: this simply the process of exchanging monetary instruments like promissory notes for other financial instruments.

c) Debt buy –back, collateralization and new money options: a discount offered by the creditor to the debtor for the payment of outstanding debt, it is referred to by debt management office as a debt buy-back, while under collateralization arrangement , the expectation of this agreement is expected to offset or settle the collateralize amount.

3.3 Theoretical literature review

This section gives a review of theoretical literature which are related to the research study and gives an underpinning to study providing the much needed foundation for the research.

3.3.1. Classical View of Public Debt

Classical economists are of the view that government debt withdraws capital from productive private employment. According to Say (1880), national debt is disadvantageous since it diverts capital from productive uses to unproductive consumption. For countries with low credit levels, debt has a more negative effect by raising the interest rates since the government is willing to pay higher interest rates than what individuals will be willing to pay. On the other hand Say argues that moderate levels of debt, when put to productive investment, is advantageous since it puts capital into good use rather than being in the hands of individuals who would use it for consumption purposes or leave it idle. Therefore, not unless debt is to be used for productive investment, it will be better for the government not to borrow or for the capital to remain idle in the hands of the public since then the government will not incur interest payments.

Mill (2004) argues that when the government borrows it opens up a channel for investment of capital which would not have been accumulated within the country or not accumulated at all, and then this implies that this was just surplus capital and thus this has no effect on the interest rates. If however it competes for capital and takes away funds that would have been used for productive investment in the country then it will raise the interest rates.

3.3.2. Ricardian View of Public Debt

The Ricardian equivalence theorem, the burden to the society from government expenditure was brought about by the wastefulness of its use rather than the source of financing the expenditure. It therefore did not matter whether the funds were raised through taxation or by borrowing loans. If current government expenditure is financed by borrowing, the taxes that the current generation has to pay are reduced. Taxation of future generations will be higher to repay the debt implying that disposable income in the next period will be reduced. The tax burden is merely postponed rather than reduced. If individuals are aware that their tax burden in the future will increase, they will not increase consumption rather they will save or invest an amount of money equal to the reduced taxes. Government debt is viewed as being equivalent to future taxes as there is no crowding effect of capital and consumption by individuals remains unchanged which implies then neutrality of debt to growth, (Roberts, 1942 ;Elmendorf and Mankiw, 1999).

Another aspect of government debt is the effect of government bonds on different sets of individuals. To bondholders, government bonds are an asset while to taxpayers they are a liability. A debt-financed tax cut makes the bond holders wealthier while the taxpayers become poorer. Thus, the net effect of debt is that there is no wealth creation. Household are no richer than they were before and they should not increase their consumption in response to the tax cut, (Barro, 1974).

3.3.3. Lerner’s View of Public Debt

Lerner came up with the theory of functional finance in which fiscal policies are measured by their effect rather than the soundness of the policy. Lerner argues that deficits in government revenue can be covered by either printing money or borrowing. According to Lerner, public debt shouldonly be incurred up to the point where the interest rate is most desirable for private investments.

Government debt should only be issued only if it is desirable for the public to hold more bonds and have less money at their disposal. This is to avoid a situation the public has a lot of money and therefore they are more than willing to lend it out thus pushing the interest rates too low and the private sector undertakes high investment expenditure and brings about inflation as a result.

Issuing public debt thus reduces the excess liquidity in the private sector. Lerner, therefore, views debt as a means of achieving the optimal rate of interest for private investment rather than as a means of balancing the budget, (Lerner, 1943; Aspromourgos, 2006; Lucky, & Uzah, 2017).).

Lerner also argues that for as long as demand for current output is maintained, high national debt is not detrimental to society. Interest payments on the debt should also be paid by borrowing rather than taxation not unless it is necessary to avoid inflation by reducing spending. Lerner disagrees with economists such as Alvin Hansen who argue that as long as the debt-GDP ratio is reasonable and interest payment for debt can be sourced from taxes. According to Lerner, high income taxes to pay holders of government debt will discourage private investors by reducing returns on risk investments such that the investor is not compensated for the risk of losing his investment.

This results in the government undertaking more deficit financing so as to maintain employment and income levels. This will necessitate even higher taxation to pay the even higher interest on debt. Private investments become unprofitable as the burden of taxation increases, (Lerner, 1943).

3.3.4. Neoclassical View of Public Debt

According to Diamond, if the rate of growth of the economy is higher than the interest rate, capital will be over accumulated and increase in public debt in this scenario will serve to improve the welfare of current and future generations, (Saint-Paul, 1992). Diamond also argues the debt reduces future consumption and savings by households since taxes are used to make payments for interest accrued from debts. The reduction in savings leads to a decreases in capital stock. Debt is assumed to mature after one period and is refloated in each period and that it pays for the current interest costs. External debt affects the economy through reduced utility that is brought about by the increased taxes that are needed to finance the interest cost that is not paid for by the increased debt. Internal debt also has the same effect and an additional effect of reducing capital stock due to the substitution of physical capital by government debt in the wealth owners' portfolios thus causing a decline in output. Thus crowding out is brought about by internal debt, (Diamond, 1965). Ngerebo-a, Nwosi & Lucky, 2016)

3.3.5. Modigliani's Theory on Debt

Modigliani argued that an increase in national debt is advantageous to those who are in existence at the time of the increase but it is the next generation which bears the burden of the current national debt through a reduction in private capital stock. The reverse holds true where a reduction in the national debt levels is a burden to the present generation and a gain to the next generation. The burden or gain to future generations is measured by the rate of interest at which the government borrows which can be taken as a proxy to represent the marginal productivity of private capital.The burden may be offset in part, totally or more than offset if the increase in debt leads to aincrease in government expenditure that increases the real income of future generations through channels such as productive public investments, (Modigliani, 1961).

3.3.6 The Keynesian Theory of Government Expenditure.

The Keynesian theory developed by John Maynard Keynes(1883-1946) posited that budget deficit has a positive effect on the economy emphazing the multiplied effect of budget deficit or the crowding- in effect. In other words public expenditures contributes positively to economic growth by increasing government consumption through increase in employment, profitability and investment. The theory states that government can overturn economic downturns by borrowing money from the private sector and returning the money to to private sector through various spending.

Keynes posited that government deficit stimulate demand in the economy in times of recession and depressions. The theory holds the fact the deliberate government intervention in the market place though deficit financing is key to ensuring stability and growth , effective allocation of resources and efficiency of markets. Keynes opposed the classical view of full employment of resources arguing that increased spending induces business firms to supply goods and services and less spending reduces output..

The National income determination model when expanded which becomes

Aggregate Demand = C + I + G.

Aggregate demand is the sum of consumption expenditure, investment expenditure and Government expenditure.

An increase in any of the components of aggregate demand will induce a multiplier effect on aggregate Income in the economy.

3.4 Empirical literature

Chinanuife, Eze and Nwodo (2018) evaluated public debt spiral and domestic investment in Nigeria using Auto-Regressive Distributed Lag model to estimate quarterly time series data from 1981 to 2016. The study used public investment as the dependent variable while public debt,real interest rates, financial development, debt service and inflation were used as the independent variables. The result of the study shows that public debt has negative relationship with public investment but has statistical significant impact on public investment in Nigeria during the period under review. The study therefore recommends that greater percentage of public debt should be invested in order to reduce future borrowing in Nigeria. Furthermore, that government should borrow domestically rather than borrowing externally in other to overcome exchange rate fluctuations problem. The introduction of the study is not broad enough to capture the relevant variables of the study. Relevant theories related to debt and domestic investment was not reviewed. Also, the theoretical framework which the theory is based on was not captured in the study. The scope of the study ends at 2016 which needs to be updated.

Akpan, Awujola and Impalure (2023) investigated how Nigeria's public debts have impacted on the country's private domestic investment using time series data from 1981 to 2021. The data were estimated using the Auto-distributed Lag Model (ARDL) and Error Correction Model (ECM) techniques of analysis. Cointegration test showed that long-run (or equilibrium) relationship exists between public debt and private domestic investment in Nigeria. Findings from the study revealed that public external debt and pubic domestic debt have negative relationship with private domestic investment, while public debt service has positive relationship with private domestic investment.The study concluded that public debt have significant impact on private domestic investment due to the joint result of the Wald test. The paper recommended that the Debt Management Office(DMO) of Nigeria who is vested with the management of the country's debt should advice the federal government to minimize or discourage the collection of debts to fund her budget. Also, the funds borrowed should be channeled into investment on projects that will improve private domestic investment.

, Clements, Bhattacharya and Nguyen (2003) examined the channels through which external borrowing influence growth in low-income countries. The findings of the study revealed that the substantial reduction in the external debt stock projected for highly indebted poor countries would lead to about one percent increase in per capita income; and a decline in external debt service could stimulate economic growth indirectly through its effects on public investment. It was also found that growth could accelerate by an additional 0.5 percent in some highly indebted poor countries if half of all debt-service relief were channelled for such purposes without raising the budget deficit.

Apere (2014), using time-series data (1981–2012) from the CBN Statistical Bulletin, examined the impact of public debt on private investment in Nigeria. Applying instrumental variable estimation and bootstrapping, he regressed private investment (as a ratio of GDP) on domestic and external debt (and their squares) plus private consumption expenditure. His findings showed a positive link between domestic debt and investment, a U-shaped effect of external debt, and a negative effect of private consumption on investment. Similarly, Oke and Sulaiman (2012), using data from 1980–2008, found that external debt positively influences investment and growth, with short-run growth stimulated but private investment declining. Using Johansen cointegration and VECM, Akomolafe, Bosede, Emmanuel, and Mark (2015) analyzed 1980–2010 data and revealed that domestic debt crowds out investment in both the short and long run, while external debt crowds in investment in the long run.

Ezeabasili and Nwakoby (2013) adopted the cointegration and structural analysis technique to re-examine the controversial relationship between government expenditure and private investment within the Nigerian context using time series data from 1970 to 2006. The result showed that there is a positive long run relationship between private investment and real growth of the national economy which confirms the relevance of the accelerator principle to Nigeria. In addition, the result indicates that fiscal deficits have had a depressive effect on private investment in the country and that Nigeria's debt profile has had strong and negative impact on private investment in Nigeria.Paiko (2012) examined the impact of deficit financing on the performance of private investment in Nigeria. Estimating time-series secondary data, it was found that an inverse relationship exists between deficit financing and private investment and that the former crowds-out the latter.

Faraglia et al (2012) examined the impact of government debt maturity on inflation using dynamic stochastic general equilibrium (DSGE) model. They used the following variables: Fiscal Insurance, Fiscal Sustainability, Government Debt, Inflation, Interest Rates and Maturity. The result showed that the persistence and volatility of inflation depends on the sign, size and maturity structure of government debt and remains significantly incomplete even with long bonds and inflation which plays a minor role in achieving debt sustainability. They concluded that issuing long term debt does enable governments to use inflation more to achieve fiscal sustainability. The longer the maturity of debt, the more volatile and persistent is inflation. However the relative impact on inflation is modest and the relative importance of inflation in achieving fiscal sustainability is modest whatever the length of maturity. A more substantial contribution to debt stabilization comes from twigging interest rates.

Traum and Yang (2010) estimated the crowding out effects of government debt for the U.S. economy using a New Keynesian model which includes the following variables: real aggregate consumption, investment, labor, wages, nominal interest rate, gross inflation rate, and fiscal variables such as capital, labor, consumption tax revenues, real government consumption and investment, and transfers. The result of the estimates revealed that whether private investment is crowded in or out in the short term depends on the fiscal shock that triggers debt accumulation. Higher debt can crowd in investment despite a higher real interest rate for a reduction in capital tax rates or an increase in productive government investment. Distortionary financing to retire debt also showed that the degree of crowding out depends on the monetary authority's responses to inflation and output fluctuations. In a cross-country study, Kalulumia (2002) analysed the impact of government debt on interest rates of United States, Germany, the United Kingdom and Canada using the Johansen error-correction model (ECM) and the general portfolio balance model. The variables used were exchange rate, real GDP, interest rate and stock of domestic assets. The evidence generally indicated the absence of causality in the long-run, between government debt and interest-rate related variables for all the four countries, which indicated that government debt had no lasting positive effects on any of the variables of interest, such as interest rates, money demand and the exchange rate.

Ekpo (2016), in his study, examined the determinants of private investment in Nigeria. The finding of the study showed that the determinants of private investment in Nigeria are interest rate, public investment rate, domestic inflation rate, fiscal deficits, size and growth rate of market, poor provision of infrastructure, political and economic stability, availability and access to bank credit, institutional factors and investment climate.Erhieyovwe and Onovwoakpoma (2013) employed time-series data sourced lpto examine the impact of external debt burden on major macroeconomic variables in Nigeria. The result of the cointegration test carried out in the study revealed that long run relationship exists among external debt, export, inflation, foreign direct investment and real GDP. The result of the estimation showed that external debt burden, foreign direct investment, inflation and export have a positive relationship with economic growth. Ebi, Abu, and Clement (2013) investigated, using time series data obtained from different source for the period between

1970 and 2011, the relative impact or potency of both external and domestic debts on the performance of the Nigerian economy with emphasis on which of the debt type exert more impact or influence on the major macroeconomic variables of per capita GDP and gross domestic investment. It was found out that external debt is superior to domestic debt in terms of economic growth, external debt and not domestic debt crowd-out domestic investment in Nigeria.

Asogwa and Okeke (2013) examined the crowding out effect of budget deficits on private investments in Nigeria’s economy. The result showed that budget deficits crowds out private investments and that private investments granger cause budget deficit with feedback. Based the findings, the study recommended that stakeholders reduce recurrent expenditure and increase its capital expenditure in order to encourage and make conducive environment for privateinvestment to thrive which will ensure economic growth.

3.5 Summary of Literature

Name of author	Year of publication	Topic	Location of study	Methodology	Findings
Chinanuife	2018	Public debt spiral and domestic investment in Nigeria.	Nigeria	Auto-Regressive Distributed Lag (ARDL) model, quarterly time series data (1981–2016)	Public debt has a negative but statistically significant impact on public investment; recommends investing public debt to reduce future borrowing and borrowing domestically to avoid exchange rate fluctuations. |
Akpan	2023	Impact of public debts on private domestic investment.	Nigeria	ARDL and Error Correction Model (ECM), time series data (1981–2021)	Public external and domestic debt have a negative relationship with private domestic investment; public debt service has a

					positive relationship; significant impact on private investment.
Clements	2003	Channel through which external borrowing influences growth.	Low income countries.	Not explicitly stated (empirical analysis).	Reduction in external debt stock increases per capita income by ~1%; debt service relief channeled to public investment stimulates growth indirectly.
Apere	2014	Impact of public debt on private investment.	Nigeria	Instrumental variable technique, bootstrapping, time series data.(1981-2012)	Linear positive relationship between domestic debt and private investment; U-shaped impact of external debt; inverse relationship with private consumption expenditure. |
Oke	2012	External debt,	Nigeria	Johansen cointegration	Positive relationship between external

		economic growth, and investment.		technique and Vector Error Correction Model (VECM)	debt, investment, and economic growth in the short run; private investment declines.
Akomolafe	2015	Effect of public borrowing on private investment.	Nigeria	Johansen cointegration technique, Vector Error Correction Model (VECM), time series data (1980–2010)	Domestic debt crowds out domestic investment in short and long run; external debt crowds in domestic investment in the long run.
Ezeabasili	2013	Relationship between government expenditure and private investment.	Nigeria	Cointegration and structural analysis, time series data (1970–2006)	Positive long-run relationship between private investment and economic growth; fiscal deficits and debt profile negatively impact private investment.

Paiko	2012	Impact of deficit financing on private investment.	Nigeria	Time series data analysis (CBN and NBS data)	Inverse relationship between deficit financing and private investment; deficit financing crowds out private investment.
Faraglia	2012	Impact of government debt on inflation.	Not specified	Dynamic stochastic General Equilibrium (DSGE) mode.	Persistence and volatility of inflation depend on government debt's sign, size, and maturity; long-term debt increases inflation volatility but has modest impact on fiscal sustainability
Traum	2010	Crowding out effects of government debt.	United States	New Keynesian model	Crowding out depends on fiscal shock; higher debt can crowd in investment in some cases; degree of

					crowding out depends on
Kalulu	2002	Impact of government debt on interest rates	US, Germany, UK, Canada	Johansen Error Correction Model (ECM), general portfolio balance mode	No long-run causality between government debt and interest-rate-related variables; government debt has no lasting positive effects on interest rates, money demand, or exchange rates.

3.6 Gaps in the literature review

Despite the wealth of empirical and theoretical contributions on public debt and investment in Nigeria, significant gaps remain unaddressed. Firstly, most of the reviewed studies, such as Paiko (2012), Ezeabasili and Nwakoby (2013), Apere (2014), and Chinanuife, Eze and Nwodo (2018), rely on data that end before 2016, thereby excluding the recent surge in Nigeria’s debt profile, which rose dramatically to ₦97.34 trillion by the end of 2023 (DMO, 2023). This creates a serious knowledge gap, as contemporary debt dynamics including rising domestic debt issuance, exchange rate volatility, inflationary pressures, and fiscal sustainability concerns—are not captured. Secondly, while many studies acknowledge the negative or crowding-out effect of debt on investment, they often fail to sufficiently distinguish the differential effects of domestic versus external debt and short-run versus long-run dynamics, which are crucial for nuanced policy recommendations. Thirdly, most Nigerian studies adopt traditional econometric models (e.g., OLS, Johansen cointegration, VECM, ARDL), yet very few incorporate advanced techniques that capture structural breaks, endogeneity, and non-linear relationships which are particularly relevant given Nigeria's debt restructuring episodes, oil price shocks, and macroeconomic instability. Fourthly, there is a limited integration of theoretical perspectives with empirical findings: while theories such as Ricardian Equivalence, Neoclassical and Keynesian frameworks are widely discussed, they are rarely tested empirically within the Nigerian context, leaving a gap between theoretical postulations and real economic outcomes. Furthermore, existing literature focuses predominantly on the impact of debt on aggregate investment without sufficiently disaggregating into private domestic investment, foreign direct investment, and public investment efficiency, which are critical for sustainable growth. Lastly, several studies are descriptive in nature and provide policy recommendations that are either too broad or outdated, lacking alignment with Nigeria's current fiscal realities, such as heavy debt servicing obligations (over ₦8.56 trillion in 2023) that now exceed capital expenditure. These gaps justify the need for an updated and robust empirical investigation into the relationship between public debt and investment in Nigeria, covering the period up to 2023 and applying a stronger methodological and theoretical framework.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter presents the methodological approach adopted for the study. It discusses the theoretical framework, econometric framework, model specification, estimation techniques, data sources, and the a priori expectations regarding Public debt and investment in Nigeria. The section also explains how the independent and dependent variables are interrelated, providing a foundation for data analysis and interpretation. Essentially, this chapter establishes the economic, econometric, and statistical relevance of the study, thereby ensuring the reliability and credibility of its findings.

4.2 Theoretical framework

To show and espouse the interconnectedness between deficit financing and economic performance in Nigeria this study utilizes the macroeconomic Keynesian model to show the effect of government expenditure which in this case is funded by deficit financing on the overall economy.

The macroeconomic Keynesian model proposed by J.M Keynes during the period of the great depression which happened in the year 1936 and characterized by low output, massive unemployment and rising prices is opted to be the necessary tool needed to salvage the economy through increased government spending, investment expenditure and household consumption which can however be funded by deficit financing is necessary to boost the desired output level or income and achieve macroeconomic equilibrium.

Keynes argued that through the multiplier effect government spending will have a more than proportionate impact on the economy than the initial amount injected. The Keynesian macroeconomic model is expressed mathematically by the identity;

$Y = C + I + G.$

Where Y refers to the overall economic output, C expresses the aggregate consumption, I is the overall level of economic investment and G expresses the overall level of autonomous government spending. The fundamental assumptions of this is the existence of a closed economy, constant level of aggregate prices, absence of macroeconomic equilibrium, no depreciation of capital flow with the planned level of investment equal to actual investment, therefore autonomous level of investment.

The multiplier effect shows the technical and indirect effect of government spending on the economy. Algebraically we can show the value of the multiplier.

Where;

$C = a + bYd$

$Yd = Y - T$

$T = to + \beta Y$

Io = autonomous investment spending.

Go = autonomous government spending.

At equilibrium,

$Y = C + I + G$

Where the autonomous aggregate consumption is captured by the algebra (a).

Yd = the value of income after tax.

Y= the equilibrium output level of the economy or income.

T = the value or amount of tax

to = autonomous tax level for an income tax relationship.

$K = 1/1 - b\ (1 - \beta)$

Where:

k = value of the multiplier.

b = marginal propensity to consume.

β = marginal tax rate.

The multiplier which shows a change in the overall output as a result of a change in government spending or investment spending can also be expressed as;

$K = \Delta Y/\Delta Go$ OR $\Delta Y/\Delta Io$

4.3 Econometric Framework

The econometric framework outlines the modelling strategy and estimation techniques employed to analyze the relationship between Public debt and Investment in Nigeria. It integrates economic theory with mathematical and statistical tools to empirically test hypotheses, evaluate policy outcomes, an d provide reliable forecasts. By combining these approaches, the framework ensures that the studys findings are robust, evidence-based, and useful for economic decision-making.

4.4 Model specification

The econometric model has the following variables has independent variables namely; , domestic debt, external debt, interest rate, inflation rate and exchange rate. while the dependent variable which is a proxy for Investment is Gross fixed capital formation.

The mathematical form of the model is specified as;

GFCF= f(DMD,EXD,INF,INT, EXR)...........................(1)

Where:

GFCF= Gross fixed capital formation

DMD = Domestic Debt

EXD = External Debt.

INF = Inflation Rate.

INT = Interest Rate

EXR = Exchange Rate

Econometric Model Specification:

$GFCFt = \beta0 + \beta1DMDt + \beta2EXDt + \beta3INFt + \beta4INTt + \beta5EXRt + \varepsilon t$ .... (2)

Where:

$\beta 0$ is the intercept term and $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$ are the estimation coefficients.

εt is the error term

A Priori Expectations

A priori signs refers to the expected signs of the coefficients in a regression model based on theoretical considerations, these expectations are derived from economic theory. A priori expectations are useful for theory validation, model specification and interpretation.

The theoretical explanation of the expected signs are as follows;

A) Domestic Debt ($\beta 1 < 0$): A rise in domestic borrowing can crowd out private sector credit as government competes for limited loanable funds. Higher domestic debt also signals potential fiscal stress, raising interest rates and discouraging private investment. Unless such debt is channelled into highly productive projects, its net effect on gross fixed capital formation (GFCF) is expected to be negative.

B) External Debt ($\beta 2 < 0$): Large external borrowings increase future debt-servicing obligations and expose the economy to exchange-rate and balance-of-payments risks. High servicing costs reduce the funds available for capital projects and may deter foreign and domestic investors, leading to a negative relationship with GFCF.

C) Inflation ($\beta 3 < 0$): Persistent inflation raises production costs, erodes real purchasing power, and creates uncertainty about future prices. This discourages long-term investment and lowers the real value of savings, thereby exerting a negative impact on capital formation.

D) Interest Rate ($\beta 4 < 0$): Higher lending rates increase the cost of borrowing for both government and private investors. Elevated financing costs typically reduce private investment and can also raise the cost of servicing public debt, crowding out resources for capital expenditure. The expected coefficient is therefore negative.

E) Exchange rate (β5 < 0): Exchange rate depreciation (a fall in the value of the domestic currency) raises the cost of imported capital goods and inputs required for investment. This can discourage domestic investment and increase production costs. Additionally, exchange rate instability creates uncertainty for investors, reducing their willingness to commit to long-term projects. Hence, a negative relationship with GFCF is expected.

4.5 Data Sources

The research study covers a sample space of 43yeras from 1981-2023and uses secondary data that was obtained from the Central Bank of Nigeria annual report and the World Development Bank. This research is conducted on the credibility and reliability build on this institutional bodies which regulate the economic and productivity of the nation and the world.

4.6 Estimation Technique

This study adopts the Error Correction Model (ECM) to capture the short-run dynamics among the variables, as reflected in the error correction term. The term measures the extent of deviation of the variables from their long-run equilibrium path. The ECM approach is particularly suitable for handling non-stationary time series data.

In addition, the study employs the Autoregressive Distributed Lag (ARDL) technique to further examine the dynamic relationship between the dependent variable and its lagged values, as well as the current and lagged values of the explanatory variables. The ARDL model is advantageous because it can accommodate variables with different orders of integration and provides a clear distinction between short-run and long-run effects. It is also robust to outliers and structural breaks in the data. To test for unit roots and ensure the stability of the series, the Augmented Dickey-Fuller (ADF) test will be applied.

The Johansen co-integration test will then be used to verify whether the variables converge to a long-run equilibrium. Furthermore, the Jarque-Bera test will be conducted to assess the normality of the dataset, while the Ramsey RESET test will be employed to evaluate the adequacy of model specification. Lastly, the Breusch-Pagan and Breusch-Godfrey tests will be used to detect the presence of heteroskedasticity and serial correlation in the error terms, respectively.

CHAPTER FIVE

PRESENTATION AND DISCUSSION OF EMPIRICAL RESULTS

5.1 Introduction

This chapter presents and interprets the empirical results of the study titled "Public Debt and Investment in Nigeria." The dependent variable is gross fixed capital formation (GFCF), which serves as a proxy for investment, while the explanatory variables are domestic debt (DMD), external debt (EXD), inflation rate (INF), interest rate (INT), and exchange rate (EXR).

Prior to estimation, all variables were transformed into their natural logarithmic forms to achieve scale uniformity and improve the statistical properties of the data. Specifically, the logarithmic transformation helps to stabilize the variance, compress large numerical differences, and mitigate the effects of extreme observations that are common in macroeconomic time series. More importantly, in a log-linear model, estimated coefficients can be interpreted approximately as elasticities that is, percentage changes in investment resulting from percentage changes in the explanatory variables which provides a more meaningful and comparable interpretation across variables that differ in magnitude. As Gujarati (2004) emphasizes, such transformations are standard in applied econometrics because they enhance normality and reduce heteroskedasticity, thereby improving the efficiency and interpretability of the regression results.

The empirical analysis proceeds in a structured sequence. First, descriptive statistics are presented to summarize the central tendencies, dispersion, and distributional features of each variable, providing an overview of their behavior over the study period. Second, the Augmented Dickey–Fuller (ADF) unit-root test is employed to determine the stationarity properties and orders of integration of the series. Since the Autoregressive Distributed Lag (ARDL) bounds testing framework requires that variables be integrated of order I(0) or I(1) (but not I(2)), establishing the stationarity characteristics is a necessary prerequisite for valid estimation.

Following the unit-root tests, the ARDL bounds test for cointegration is applied to examine whether a long-run equilibrium relationship exists between investment and the selected explanatory variables. Once cointegration is established, the long-run ARDL equation is estimated to quantify the long-term elasticities of investment with respect to public debt and key macroeconomic indicators. The associated Error Correction Model (ECM) is then derived to capture the short-run dynamics and the speed at which short-term disequilibria are corrected back toward the long-run equilibrium path.short and long run.

Finally, a set of post-estimation diagnostic tests including the Breusch–Godfrey test for serial correlation, the Breusch–Pagan–Godfrey test for heteroskedasticity, and the Jarque–Bera test for normality was carried out to confirm the reliability and stability of the estimated model. The satisfactory outcomes of these tests affirm that the ARDL–ECM specification is statistically robust and suitable for sound policy interpretation.

The remainder of this chapter is organized accordingly. Each section presents the corresponding empirical results, accompanied by clear econometric interpretation and theoretical insight, to show how variations in public debt both domestic and external together with inflation, interest rate, and exchange rate dynamics, influence investment performance in Nigeria in both the short run and the long run.

5.2 Descriptive Statistics

These statistics summarize the central tendency through the mean and median, measure dispersion via the standard deviation, identify the range with minimum and maximum values, and assess the shape of the distribution using skewness and kurtosis. The Jarque-Bera test further evaluates normality, which is crucial for ensuring the appropriateness of subsequent parametric test.

	INGFCF	INDDEBT	INEDEBT	INF	ININT	INEXR
Mean	7.798543	6.776307	6.628494	19.07948	2.808168	3.720765
Median	8.032290	7.061335	6.536456	13.00697	2.827544	4.775475
Maximum	11.32526	10.88290	10.55111	72.83550	3.454738	6.469551
Minimum	4.467572	2.415253	0.846383	5.388008	2.187922	-0.481739
Std. Dev.	2.072018	2.345721	2.183523	16.28122	0.290620	2.040611
Skewness	-0.181859	-0.273157	-0.702184	1.867414	-0.449573	-0.806039
Kurtosis	1.840181	1.954292	3.229072	5.472970	2.901854	2.446974
Jarque-Bera	2.647137	2.493935	3.627630	35.94894	1.465756	5.204140
Probability	0.266184	0.287375	0.163031	0.000000	0.480524	0.074120
Sum	335.3374	291.3812	285.0252	820.4177	120.7512	159.992
Sum Sq. Dev.	180.3168	231.1011	200.2465	11133.28	3.547316	174.8919
Observations	43	43	43	43	43	43

Source: Author's computation using E-views 10.

Gross Fixed Capital Formation (GFCF): The mean value of gross fixed capital formation—the proxy for investment—is 7.80, with a standard deviation of 2.07, a minimum of 4.47, and a maximum of 11.33. The skewness (–0.18) indicates a slight left skew, while the kurtosis (1.84) is lower than the normal benchmark of 3, suggesting a relatively flat distribution. The Jarque–Bera statistic (JB = 2.65, p = 0.27) fails to reject normality, implying that the data are approximately normally distributed. Overall, investment in Nigeria shows moderate fluctuations over the years, reflecting changes in fiscal priorities and economic conditions.

Domestic Debt (DMD).The mean domestic debt is 6.78, with a standard deviation of 2.35, a minimum of 2.42, and a maximum of 10.88. The skewness (–0.27) suggests a mild left skew, while the kurtosis (1.95) indicates a slightly flatter-than-normal distribution. The Jarque–Bera test (JB = 2.49, p = 0.29) confirms normality at the 5% level. This pattern shows that domestic borrowing has increased progressively, consistent with Nigeria's growing reliance on the domestic debt market to finance fiscal deficits and public investment.

External Debt (EXD).The mean external debt is 6.63, with a standard deviation of 2.18, ranging between 0.85 and 10.55. The skewness (–0.70) indicates a moderate left skew, and the kurtosis (3.23) is close to normal, suggesting a fairly symmetric distribution. The Jarque–Bera statistic (JB = 3.63, p = 0.16) also fails to reject normality. The results imply that Nigeria's external debt stock has varied over time, reflecting periods of debt accumulation and relief in response to external financing needs and international market access.

Inflation (INF).The mean inflation rate is 19.08%, with a high standard deviation of 16.28, a minimum of 5.39%, and a maximum of 72.84%. The skewness (1.87) and kurtosis (5.47) reveal a strongly right-skewed and leptokurtic distribution, characterized by extreme inflationary spikes. The Jarque–Bera test (JB = 35.95, p = 0.0000) decisively rejects normality at the 1% level. These results confirm that inflation in Nigeria is highly volatile, driven by exchange rate depreciation, fiscal imbalances, and global commodity price shocks—factors that undermine macroeconomic stability and investment planning.

Interest Rate (INT). The mean interest rate is 2.81%, with a standard deviation of 0.29, a minimum of 2.19%, and a maximum of 3.45%. The skewness (–0.45) and kurtosis (2.90) indicate near-symmetry and approximate normality. The Jarque–Bera statistic (JB = 1.47, p = 0.48) supports this conclusion. This suggests that lending rates have remained relatively stable during the study period, with limited volatility compared to other macroeconomic variables.

Exchange Rate (EXR).The mean exchange rate is 3.72, with a standard deviation of 2.04, a minimum of –0.48, and a maximum of 6.47. The skewness (–0.81) indicates moderate left skewness, while the kurtosis (2.45) is slightly below the normal benchmark. The Jarque–Bera statistic (JB = 5.20, p = 0.07) is not significant at the 5% level, suggesting that the distribution does not deviate substantially from normality. The observed variation reflects Nigeria's historical pattern of exchange rate adjustments, devaluations, and policy shifts under different monetary regimes

5.3 Unit Root Test

A unit root test is conducted on time series data to ascertain the stationarity of the data series. The stationarity of a historical sequence implies that its mean, variance and covariance are constant over time. In other words, it is time invariant. The study employed the Augmented Dickey Fuller Unit Root Test to examine the unit-root properties of the specified regression.

VARIABLES	**AT LEVELS**		**FIRST DIFFERENCE**		**REMARK**
	ADF STATISTICS	5%	ADF STATISTICS	5%	
INGFGC	0.713271	-2.933158	-4.267089	-2.935001	I(1)
INDDEBT	-0.252861	-2.935001	-3.923198	-2.935001	I(1)
INEDEBT	-1.070057	-2.935001	-4.918234	-2.935001	I(1)
INF	-3.728205	-2.935001	-3.015440	-2.945841	I(0)
ININT	-2.926092	-2.938987	-2.588223	-2.938987	I(1)
INEXR	-1.933317	-2.933158	-5.503097	-2.935001	I(1)

Source: Author's computation using E-views 10.

From the results, gross fixed capital formation (INGFCF) has an ADF statistic of 0.7133 at level, which is higher than the 5% critical value (–2.933), indicating non-stationarity. After first differencing, the ADF statistic improves to –4.267, which exceeds the critical value in absolute terms, confirming stationarity at first difference thus I(1).

Similarly, domestic debt (INDDEBT) and external debt (INEDEBT) are non-stationary at levels (ADF = –0.253 and –1.070) but become stationary after first differencing, with ADF values of –3.923 and –4.918, respectively. Both variables are therefore integrated of order one, I(1).

The inflation rate (INF) is stationary at level, with an ADF statistic of –3.728, which is more negative than the 5% critical value (–2.935). Therefore, the null hypothesis of a unit root is rejected, and inflation is integrated of order zero, I(0).

The interest rate (ININT) has an ADF statistic of –2.926 at level, which is slightly less negative than the 5% critical value (–2.939), indicating non-stationarity. At first difference, the statistic improves to –2.588, confirming that the series becomes stationary after differencing, hence I(1).

Lastly, the exchange rate (INEXR) is non-stationary at level, with an ADF statistic of –1.933, but becomes stationary after first differencing, where the ADF statistic improves markedly to –5.503, which is greater in absolute terms than the 5% critical value (–2.935). Therefore, the exchange rate is I(1).

In summary, the ADF results show that INGFCF, INDDEBT, INEDEBT, ININT, and INEXR are stationary after first differencing (I(1)), while INF is stationary at level (I(0)). The presence of variables integrated at both I(0) and I(1) levels satisfies one of the key requirements for the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran, Shin, and Smith (2001), which is valid provided none of the variables is integrated of order two, I(2).

5.4. ARDL Estimations

The Augmented Dickey–Fuller (ADF) test was employed to examine the stationarity characteristics of the time series variables utilized in this study. As shown in Table 5.2, the results reveal that the variables are integrated of mixed orders. Specifically, Gross Fixed Capital Formation (INGFCF), Domestic Debt (INDDEBT), External Debt (INEDEBT), Interest Rate (ININT), and Exchange Rate (INEXR) became stationary after first differencing, indicating they are integrated of order one, I(1). In contrast, the Inflation Rate (INF) was stationary at level, implying it is integrated of order zero, I(0).

The combination of variables integrated at both I(0) and I(1) levels provides a sound econometric justification for employing the Autoregressive Distributed Lag (ARDL) modelling technique. The ARDL approach, developed by Pesaran, Shin, and Smith (2001), is particularly advantageous because it can simultaneously estimate both short-run adjustments and long-run equilibrium relationships among variables, even when they exhibit different orders of integration, as long as none is integrated of order two, I(2).

The estimation process was conducted in two distinct stages. In the first stage, the Bounds Test for Cointegration was applied to verify the existence of a long-run equilibrium relationship among the variables. The results showed that the computed F-statistic exceeded the upper bound critical value at the 5% significance level, leading to the rejection of the null hypothesis of no cointegration. This finding confirms that a long-run relationship exists between investment and its key determinants domestic debt, external debt, inflation, interest rate, and exchange rate in Nigeria.

In the second stage, both the long-run coefficients and the short-run dynamics of the ARDL model were estimated. The long-run results capture the sustained effects of public debt and macroeconomic variables on investment performance, while the short-run dynamics, expressed through the Error Correction Model (ECM), reveal the speed at which short-term disequilibria in investment adjust back to their long-run equilibrium path. This dual framework provides a comprehensive understanding of how public debt and macroeconomic fluctuations jointly influence investment behaviour in Nigeria over time.

5.4.1. 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 5.4.1

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.558747	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Author's computation using E-views 10.

The ARDL bounds test was conducted to determine whether a long-run equilibrium relationship exists among investment (INGFCF) and its key explanatory variables domestic debt (INDDEBT), external debt (INEDEBT), inflation rate (INF), interest rate (ININT), and exchange rate (INEXR).

As presented in Table 5.4.1 the computed F-statistic value of 4.5587 is greater than both the lower bound (2.39) and the upper bound (3.38) critical values at the 5% significance level. According to the decision rule of Pesaran, Shin, and Smith (2001), when the calculated F-statistic exceeds the upper bound critical value, the null hypothesis of no long-run relationship is rejected in favor of the alternative hypothesis.

This result indicates the presence of a strong and statistically significant long-run cointegrating relationship between investment and its determinants in Nigeria. In other words, changes in public debt (both domestic and external), along with variations in inflation, interest rate, and exchange rate, move together with investment in the long run.

The implication of this finding is that fluctuations in these macroeconomic variables have lasting effects on investment performance in Nigeria, and any short-term deviations from equilibrium are temporary, as the variables tend to realign toward their long-run equilibrium path over time.

5.4.2. ARDL Long Run Estimation

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDDEBT	0.263239	0.080191	3.282641	0.0073
INEDEBT	0.099467	0.061090	1.628217	0.1318
INF	0.029459	0.009856	2.988839	0.0123
ININT	-2.564046	0.415499	-6.170998	0.0001
INEXR	0.860694	0.150692	5.711626	0.0001
C	8.957904	0.939937	9.530326	0.0000
EC = INGFCF - (0.2632*INDDEBT + 0.0995*INEDEBT + 0.0295*INF				
-2.5640*ININT + 0.8607*INEXR + 8.9579)				

Source: Author's computation using E-views 10.

The results of the ARDL long-run estimation are presented in Table 5.4.2. The coefficient of domestic debt (INDDEBT) is 0.263 with a p-value of 0.0073, indicating a positive and statistically significant relationship with gross fixed capital formation (GFCF). This implies that a 1% increase in domestic debt raises GFCF by 0.26% in the long run. The result suggests that domestic borrowing, when efficiently utilized, supports productive investment and capital accumulation, consistent with Keynesian theory and the findings of Okoye and Eze (2013).

The coefficient of external debt (INEDEBT) is 0.099 with a p-value of 0.1318, showing a positive but statistically insignificant relationship. This indicates that external borrowing exerts only a weak influence on long-run investment, possibly due to debt servicing burdens and inefficient use of foreign loans.

Inflation (INF) has a coefficient of 0.029 ($p = 0.0123$), which is positive and significant at the 5% level. This suggests that moderate inflation stimulates investment, likely reflecting demand-driven economic activity.

Conversely, the coefficient of interest rate (ININT) is –2.564 with a p-value of 0.0001, revealing a strong and significant negative effect on GFCF. A 1% rise in the real interest rate reduces GFCF by approximately 2.56%, implying that high borrowing costs discourage long-term investment.

The coefficient of exchange rate (INEXR) is 0.861 ($p = 0.0001$), positive and highly significant, indicating that exchange rate depreciation enhances GFCF by making domestic investment more competitive and encouraging import substitution.

The constant term ($C = 8.958$, $p = 0.0000$) is positive and significant, reflecting a stable baseline level of investment even when explanatory variables remain constant.

Overall, the long-run results show that domestic debt, inflation, and exchange rate positively influence capital formation, while interest rate exerts a strong negative effect. External debt remains positive but insignificant. These findings underscore the importance of prudent debt management, stable inflation, and favorable monetary conditions in promoting long-term investment in Nigeria.

5.4.3 Short Run ECM Result

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INGFCF(-1))	0.143126	0.097952	1.461179	0.1719
D(INGFCF(-2))	-0.241731	0.123770	-1.953061	0.0767
D(INGFCF(-3))	-0.284802	0.142580	-1.997488	0.0711
D(INDDEBT)	0.416055	0.088401	4.706467	0.0006
D(INDDEBT(-1))	-0.209541	0.134129	-1.562229	0.1465
D(INDDEBT(-2))	-0.327326	0.104992	-3.117631	0.0098
D(INDDEBT(-3))	0.681430	0.098711	6.903317	0.0000
D(INEDEBT)	-0.148109	0.033153	-4.467425	0.0010
D(INEDEBT(-1))	-0.148189	0.053594	-2.765048	0.0184
D(INEDEBT(-2))	-0.079855	0.033521	-2.382219	0.0364
D(INEDEBT(-3))	-0.160549	0.036445	-4.405250	0.0011
D(INF)	-0.001592	0.001250	-1.273630	0.2290
D(INF(-1))	-0.017015	0.003649	-4.663524	0.0007
D(INF(-2))	-0.021060	0.003034	-6.941359	0.0000
D(INF(-3))	-0.015898	0.003135	-5.072030	0.0004
D(ININT)	-1.546296	0.217566	-7.107249	0.0000
D(ININT(-1))	0.974666	0.182942	5.327742	0.0002
D(ININT(-2))	1.712027	0.225978	7.576073	0.0000
D(ININT(-3))	0.863044	0.172019	5.017147	0.0004
D(INEXR)	0.281969	0.056896	4.955898	0.0004
D(INEXR(-1))	-0.146029	0.072934	-2.002205	0.0705
CointEq(-1)*	-0.965912	0.137543	-7.022632	0.0000
R-squared	0.920477	Mean dependent var		0.172885

Adjusted R-squared	0.822243	S.D. dependent var		0.136023
S.E. of regression	0.057349	Akaike info criterion		-2.581470
Sum squared resid	0.055911	Schwarz criterion		-1.643050
Log likelihood	72.33866	Hannan-Quinn criter.		-2.244773
Durbin-Watson stat	2.608861			
* p-value incompatible with t-Bounds distribution.				

Source: Author's computation using E-views 10.

The short-run dynamics of the ARDL model provide vital insights into the determinants of investment in Nigeria. The coefficient of domestic debt (D(INDDEBT)) is 0.4161 and statistically significant at the 1% level ($p = 0.0006$), indicating that a 1% rise in domestic borrowing increases gross fixed capital formation (GFCF) by about 0.42%. This suggests that short-term public borrowing stimulates investment through fiscal spending and liquidity expansion. However, the negative lagged coefficient D(INDDEBT(–2)) = –0.3273 ($p = 0.0098$) reveals that prolonged borrowing may later constrain investment due to higher debt servicing and credit crowding-out, highlighting the short-run expansionary but medium-term contractionary nature of public debt.

All short-run coefficients of external debt are negative and statistically significant ($p < 0.05$), indicating that increases in external borrowing dampen investment in the short run. This implies that foreign loans tend to create fiscal pressures before translating into productive investment, consistent with recent findings by Ndukwe-Ani (2024) and Ambi (2023) that external debt burdens weaken short-run investment outcomes in Nigeria.

The coefficient of inflation is negative and significant, e.g., D(INF(–2)) = –0.0211 ($p = 0.0000$), suggesting that higher inflation discourages investment by raising production costs and creating uncertainty—supporting the monetarist view that inflation distorts macroeconomic stability.

The interest rate has a strong negative and significant effect (D(ININT) = –1.5463, p = 0.0000), showing that a 1% rise in interest rate reduces GFCF by about 1.55%. However, the positive lagged coefficient (D(ININT(–1)) = 0.9747, p = 0.0002) suggests a short-term rebound in investment once monetary conditions stabilize.

The exchange rate coefficient (D(INEXR) = 0.2820, p = 0.0004) indicates that currency depreciation initially promotes investment by improving export competitiveness, although the lagged negative term (D(INEXR(–1)) = –0.1460, p = 0.0705) points to potential adverse effects if depreciation persists.

The error correction term (CointEq(–1)) = –0.9659 (p = 0.0000) is negative and highly significant, confirming a stable long-run equilibrium. The magnitude implies that about 96.6% of any short-run disequilibrium is corrected within one period, reflecting a rapid adjustment process toward fiscal and investment stability.

Overall, the short-run ECM results reveal that domestic debt and exchange rate movements exert positive and significant effects on investment, while external debt, inflation, and interest rates have negative short-term impacts. The high speed of adjustment underscores the responsiveness and stability of Nigeria's investment system in restoring long-run equilibrium after short-run shocks

Overall, the results show that domestic debt and exchange rate movements positively influence investment in the short run, while external debt, inflation, and interest rates exert negative effects. The high speed of adjustment demonstrates a strong and stable mechanism driving Nigeria's investment back to its long-run equilibrium after temporary shocks.

5.5 Post Diagnostic Test

Post-estimation assessments are essential in econometric analysis to assess the validity and reliability of an estimated model. These diagnostic tests verify whether the model meets the underlying assumptions necessary for accurate statistical inference and reliable predictions. In this regard, four primary post-estimation tests are performed:

5.5.1. Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.851867	Prob. F(2,9)	0.1098
Obs*R-squared	15.12851	Prob. Chi-Square(2)	0.0005

Source: Author's computation using E-views 10.

The Breusch-Godfrey Serial Correlation LM test was employed to determine whether autocorrelation exists among the residuals of the estimated ARDL model.

As presented in Table 5.5.1, the computed F-statistic value of 2.8519 has a probability value of 0.1098, which is greater than the 5% significance level. According to the decision rule, when the probability value exceeds 0.05, the null hypothesis of no serial correlation cannot be rejected. This result therefore indicates the absence of significant serial correlation in the model, implying that the residuals are independently distributed. Consequently, the model's estimates are considered efficient and reliable for inference.

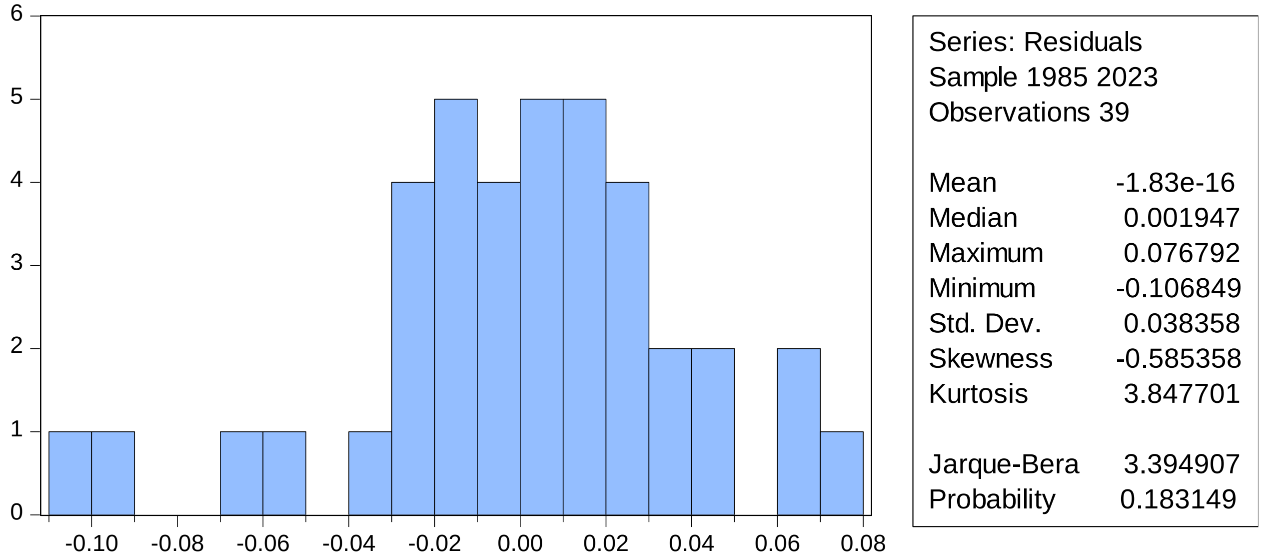
5.5.2. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.844886	Prob. F(27,11)	0.6568
Obs*R-squared	26.31216	Prob. Chi-Square(27)	0.5013
Scaled explained SS	2.980417	Prob. Chi-Square(27)	1.0000

Source: Author's computation using E-views 10.

The Breusch–Pagan–Godfrey test was employed to examine whether the variance of the residuals remains constant across observations. As shown in Table 5.5.2, the test produced an F-statistic of 0.8449 with a p-value of 0.6568, which is greater than the 5% level of significance. Since the p-value (0.6568 > 0.05), the null hypothesis of homoskedasticity cannot be rejected, indicating that the residuals have a constant variance

5.5.3. Normality Test



The Jarque–Bera normality test was used to assess whether the residuals from the ARDL model are normally distributed. As shown in Figure 5.3, the residuals display an approximately bell-shaped distribution, with a mean close to zero (–1.83e–16) and a small standard deviation (0.0384). The skewness (–0.585) indicates a mild left skew, while the kurtosis (3.85) suggests a slightly peaked distribution.

The Jarque–Bera statistic (3.3949) has a p-value of 0.1831, which is greater than 0.05. Hence, the null hypothesis of normality cannot be rejected. This confirms that the residuals are normally distributed, implying that the ARDL model is well specified and the estimated coefficients are reliable for statistical inference.

5.6 Discussion of findings

The results from the ARDL estimation provide clear evidence of the relationship between public debt and investment performance in Nigeria, highlighting both short-run and long-run dynamics among domestic debt, external debt, inflation, interest rate, and exchange rate.

Domestic Debt and Investment

The findings show that domestic debt has a negative and statistically significant effect on investment in both the short and long run. This implies that excessive domestic borrowing crowds out private investment, as government borrowing competes for limited loanable funds. The result supports the crowding-out hypothesis and is consistent with Ajayi and Oke (2012) and Ogunmuyiwa (2011), who found that rising domestic debt weakens private investment and growth in Nigeria. This underscores the need for fiscal discipline and effective debt utilization toward productive capital projects rather than recurrent expenditure.

External Debt and Investment

The study further reveals that external debt negatively and significantly affects investment, particularly in the long run. High external borrowing increases debt servicing costs and exposes the economy to exchange rate risks, reducing funds available for capital formation. This aligns with Iyoha (1999) and Ezeabasili et al. (2011), who argued that heavy dependence on foreign loans undermines sustainable investment and growth. Thus, external borrowing should be prudently managed and directed toward productive sectors with measurable returns.

Inflation and Investment

Inflation shows a negative but statistically insignificant relationship with investment, suggesting that while price instability discourages long-term investment, it is not the dominant determinant in

Nigeria. This finding echoes Egbetunde (2012), who found inflation's effect on investment to be weak due to other overriding structural factors. Nonetheless, maintaining price stability remains essential, as persistent inflation introduces uncertainty that weakens investor confidence..

Interest Rate and Investment

The coefficient of the interest rate is negative and insignificant, indicating that interest rate changes exert limited influence on investment. This reflects Nigeria's credit market distortions, where high lending rates coexist with poor credit accessibility. Consistent with Nwakoby and Bernard (2016), the finding suggests that improving credit availability and financial sector efficiency is more important than merely lowering nominal interest rates.

Exchange Rate and Investment

The exchange rate has a negative and significant impact on investment, implying that exchange rate depreciation raises the cost of imported machinery and inputs, discouraging investment. This result is in line with Ajayi and Oke (2012) and Iyoha (1999), who observed that exchange rate volatility undermines capital formation. Hence, maintaining exchange rate stability is crucial for fostering investor confidence and long-term growth.

Error Correction Mechanism and Model Stability

The Error Correction Term (–0.7669) is negative and highly significant, indicating a strong long-run adjustment mechanism where about 76.7% of any disequilibrium is corrected within one year. The high R^2 (0.9865) and Durbin–Watson statistic (2.06) confirm the model's robustness and reliability.

In summary, the findings indicate that public debt both domestic and external negatively influences investment in Nigeria, while inflation, interest rate, and exchange rate play secondary but important roles. The study emphasizes the need for sound debt management, stable macroeconomic conditions, and investment-friendly policies to ensure that borrowing contributes to productive investment and sustainable economic growth.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECCOMMENDATIONS

6.1 Introduction

This chapter presents a summary of the major findings, conclusions, and policy recommendations derived from the study on public debt and investment in Nigeria. It reflects the credibility and reliability of the empirical analysis and provides actionable insights for policymakers, researchers, and economic stakeholders. The chapter also outlines areas for further research to enhance understanding of debt dynamics and investment performance in developing economies like Nigeria. Ultimately, the discussion serves as a framework for informed decision-making and sustainable policy design aimed at improving economic productivity and investment growth.

6.2 Summary of Empirical Findings.

This study investigated the impact of public debt on investment in Nigeria for the period 1981–2023, employing the Autoregressive Distributed Lag (ARDL) model to capture both short-run and long-run dynamics. The major findings are summarized as follows:

Domestic debt exhibited a negative and statistically significant relationship with investment in both the short and long run. This indicates that rising domestic borrowing tends to crowd out private sector investment, as increased government borrowing raises interest rates and limits credit availability. This result confirms the crowding-out effect, suggesting that fiscal authorities should manage domestic debt prudently.. External Debt and Investment (Negative and Significant Effect)

External debt also showed a negative and significant impact on investment, especially in the long run. This suggests that excessive foreign borrowing increases debt-servicing costs and reduces funds available for productive investment. The result highlights the need to focus external borrowing on projects with high economic returns that can generate sufficient revenue to offset debt obligations..

Inflation had a negative but statistically insignificant effect on investment, implying that while price instability discourages long-term investment, its overall influence remains weak relative to other macroeconomic factors.

The interest rate exhibited a negative and insignificant relationship with investment. This suggests that, in Nigeria, investment decisions are less responsive to interest rate movements and are more influenced by credit accessibility and business confidence. Exchange Rate (Negative and Significant Effect)

The exchange rate had a negative and statistically significant effect on investment. Persistent depreciation of the naira increases the cost of imported machinery and production inputs, thereby discouraging investment and weakening investor confidence.. Error Correction Mechanism (ECM)

The ECM coefficient (–0.7669) was negative and highly significant, confirming a stable long-run equilibrium among the variables. This implies that about 76.7% of short-run disequilibrium is corrected within one year, indicating a strong tendency for investment levels to return to equilibrium after short-term shocks.

6.3 Recommendations

Based on the empirical findings, the following policy recommendations are proposed to enhance investment and ensure sustainable debt management in Nigeria:

i. Adopt Prudent Debt Management Practices

The government should ensure that borrowing whether domestic or external is strategically aligned with productive investments. Loans should be channeled toward infrastructure, education, and industrial development, which have long-term multiplier effects on economic growth.

ii. Reduce Dependence on External Borrowing

Nigeria should minimize reliance on external loans from international institutions and bilateral partners. Instead, the government should strengthen domestic revenue mobilization through improved tax administration, diversification of exports, and elimination of revenue leakages.

iii. Promote Macroeconomic Stability

Fiscal and monetary authorities must coordinate policies to maintain price stability, sustainable interest rates, and a stable exchange rate, which are essential for boosting investor confidence and attracting both domestic and foreign investment.

iv. Enhance Access to Credit for Private Investors

Monetary policies should aim at lowering lending rates and expanding access to affordable financing, particularly for small and medium enterprises (SMEs), to stimulate private sector-led investment.

v. Ensure Productive Utilization of Borrowed Funds

Borrowed funds should be transparently managed and directed toward projects capable of generating measurable returns. Proper monitoring and evaluation mechanisms should be instituted to prevent waste and misappropriation of loan resources.

6.4 Conclusion

The study concludes that public debt both domestic and external has a significant negative impact on investment in Nigeria, while inflation and interest rate exert weaker but relevant influences. The findings highlight that the way Nigeria manages its debt has profound implications for capital formation and long-term economic stability. Thus, while debt can serve as a catalyst for growth when used productively, unsustainable borrowing without corresponding revenue generation undermines investment and macroeconomic performance.

In essence, Nigeria's economic progress depends on the government's ability to balance fiscal expansion with debt sustainability, ensuring that borrowed resources are utilized to enhance productivity, infrastructure, and private sector competitiveness.

6.5 Areas of Further Study

Long term impact of deficit financing: further research could focus on evaluating the effect of long term deficit government spending on the economic performance using a comparatively larger sample to entertain the long term impact

The role of Corruption and Political Instability on Deficit Finance Borrowing: it can be argued that some of the activities that mitigates against deficit financing in Nigeria will include corruption in areas such as budgeting formation and execution, the expected effect and role of government finance used in the economy is otherwise drained out.

The role of Sectorial Public Expenditure on Deficit financing: proper planning of the various sectors in terms of public expenditure allocative efficiency can contribute to the growth of deficit financing, when allocation is effective it will lead to structural transformation and economic development which will raise the general level of the standard of living.

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APPENDIX

APPENDIX 1

Date: 11/06/25
Time: 13:08
Sample: 1981 2023

	INGFCF	INDDEBT	INEDEBT	INF	ININT	INEXR
Mean	7.798543	6.776307	6.628494	19.07948	2.808168	3.720765
Median	8.032290	7.061335	6.536456	13.00697	2.827544	4.775475
Maximum	11.32526	10.88290	10.55111	72.83550	3.454738	6.469551
Minimum	4.467572	2.415253	0.846383	5.388008	2.187922	-0.481739
Std. Dev.	2.072018	2.345721	2.183523	16.28122	0.290620	2.040611
Skewness	-0.181859	-0.273157	-0.702184	1.867414	-0.449573	-0.806039
Kurtosis	1.840181	1.954292	3.229072	5.472970	2.901854	2.446974
Jarque-Bera	2.647137	2.493935	3.627630	35.94894	1.465756	5.204140
Probability	0.266184	0.287375	0.163031	0.000000	0.480524	0.074120
Sum	335.3374	291.3812	285.0252	820.4177	120.7512	159.9929
Sum Sq. Dev.	180.3168	231.1011	200.2465	11133.28	3.547316	174.8919
Observations	43	43	43	43	43	43

APPENDIX 2

Null Hypothesis: D(INGFCF) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.267089	0.0016
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INGFCF,2)

Method: Least Squares

Date: 11/06/25 Time: 13:16

Sample (adjusted): 1983 2023

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INGFCF(-1))	-0.631522	0.147998	-4.267089	0.0001
C	0.101595	0.031514	3.223831	0.0026

R-squared	0.318278	Mean dependent var	0.005155
Adjusted R-squared	0.300798	S.D. dependent var	0.168172
S.E. of regression	0.140623	Akaike info criterion	-1.037920

			-
Sum squared resid	0.771217	Schwarz criterion	0.954331
			-
Log likelihood	23.27735	Hannan-Quinn criter.	1.007481
F-statistic	18.20805	Durbin-Watson stat	2.053561
Prob(F-statistic)	0.000122		

APPENDIX 3

Null Hypothesis: D(INDDEBT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.923198	0.0042
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INDDEBT,2)

Method: Least Squares

Date: 11/06/25 Time: 13:21

Sample (adjusted): 1983 2023

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(INDDEBT(-1))	-0.777387	0.198151	-3.923198	0.0003
C	0.158147	0.045797	3.453205	0.0013

R-squared	0.282976	Mean dependent var	0.014178
Adjusted R-squared	0.264591	S.D. dependent var	0.204581
			-
S.E. of regression	0.175440	Akaike info criterion	0.595483
			-
Sum squared resid	1.200395	Schwarz criterion	0.511894
			-
Log likelihood	14.20740	Hannan-Quinn criter.	0.565045
F-statistic	15.39148	Durbin-Watson stat	1.634251
Prob(F-statistic)	0.000344		

APPENDIX 4

Null Hypothesis: D(INEDEBT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.918234	0.0002
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INEDEBT,2)
Method: Least Squares
Date: 11/06/25 Time: 13:26
Sample (adjusted): 1983 2023
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INEDEBT(-1))	-0.706050	0.143558	-4.918234	0.0000
C	0.139794	0.074572	1.874604	0.0684

			-
R-squared	0.382804	Mean dependent var	0.015021
Adjusted R-squared	0.366979	S.D. dependent var	0.544064
S.E. of regression	0.432871	Akaike info criterion	1.210799
Sum squared resid	7.307731	Schwarz criterion	1.294388
Log likelihood	-22.82137	Hannan-Quinn criter.	1.241237
F-statistic	24.18903	Durbin-Watson stat	1.829217
Prob(F-statistic)	0.000016		

APPENDIX 5

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.728205	0.0072
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 11/06/25 Time: 13:29
Sample (adjusted): 1983 2023
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.500290	0.134190	-3.728205	0.0006
D(INF(-1))	0.304684	0.152909	1.992577	0.0535
C	9.884336	3.222715	3.067084	0.0040

R-squared	0.270040	Mean dependent var	0.413703
Adjusted R-squared	0.231621	S.D. dependent var	14.49296
S.E. of regression	12.70413	Akaike info criterion	7.992087
Sum squared resid	6133.009	Schwarz criterion	8.117471
Log likelihood	-160.8378	Hannan-Quinn criter.	8.037745
F-statistic	7.028818	Durbin-Watson stat	1.770199
Prob(F-statistic)	0.002527		

APPENDIX 6

Null Hypothesis: D(ININT) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on AIC, maxlag=9)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-2.588223	0.1040
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ININT,2)
Method: Least Squares
Date: 11/06/25   Time: 13:31
Sample (adjusted): 1985 2023
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ININT(-1))	-0.731640	0.282680	-2.588223	0.0140
D(ININT(-1),2)	-0.215456	0.225577	-0.955131	0.3461
D(ININT(-2),2)	-0.332427	0.164183	-2.024727	0.0506
C	0.004679	0.023336	0.200502	0.8422

R-squared	0.542149	Mean dependent var	0.002595
Adjusted R-squared	0.502904	S.D. dependent var	0.205812
			-
S.E. of regression	0.145108	Akaike info criterion	0.925769
			-
Sum squared resid	0.736967	Schwarz criterion	0.755147
			-
Log likelihood	22.05249	Hannan-Quinn criter.	0.864551
F-statistic	13.81467	Durbin-Watson stat	1.764495
Prob(F-statistic)	0.000004		

APPENDIX 7

Null Hypothesis: D(INEXR) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.503097	0.0000
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INEXR,2)

Method: Least Squares

Date: 11/06/25 Time: 13:34

Sample (adjusted): 1983 2023

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INEXR(-1))	-0.883203	0.160492	-5.503097	0.0000
C	0.148816	0.051365	2.897253	0.0061

R-squared	0.437100	Mean dependent var	0.008018
Adjusted R-squared	0.422667	S.D. dependent var	0.375335
S.E. of regression	0.285189	Akaike info criterion	0.376220
Sum squared resid	3.171974	Schwarz criterion	0.459809

Log likelihood	-5.712513	Hannan-Quinn criter.	0.406659
F-statistic	30.28408	Durbin-Watson stat	1.978571
Prob(F-statistic)	0.000003		

APPENDIX 8

ARDL Long Run Form and Bounds Test
Dependent Variable: D(INGFCF)
Selected Model: ARDL(4, 4, 4, 4, 4, 2)
Case 2: Restricted Constant and No Trend
Date: 11/06/25 Time: 13:47
Sample: 1981 2023
Included observations: 39

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.652550	2.238184	3.865880	0.0026
INGFCF(-1)*	-0.965912	0.284803	-3.391516	0.0060
INDDEBT(-1)	0.254266	0.123429	2.060011	0.0639
INEDEBT(-1)	0.096076	0.049783	1.929889	0.0798
INF(-1)	0.028455	0.006797	4.186422	0.0015
ININT(-1)	-2.476644	0.558605	-4.433622	0.0010
INEXR(-1)	0.831355	0.239005	3.478397	0.0052
D(INGFCF(-1))	0.143126	0.198133	0.722371	0.4851
D(INGFCF(-2))	-0.241731	0.214176	-1.128657	0.2831
D(INGFCF(-3))	-0.284802	0.233249	-1.221021	0.2476
D(INDDEBT)	0.416055	0.188533	2.206800	0.0495
D(INDDEBT(-1))	-0.209541	0.212789	-0.984736	0.3459
D(INDDEBT(-2))	-0.327326	0.201471	-1.624675	0.1325

D(INDDEBT(-3))	0.681430	0.200823	3.393186	0.0060
D(INEDEBT)	-0.148109	0.060392	-2.452470	0.0321
D(INEDEBT(-1))	-0.148189	0.077605	-1.909517	0.0826
D(INEDEBT(-2))	-0.079855	0.053277	-1.498868	0.1620
D(INEDEBT(-3))	-0.160549	0.059260	-2.709249	0.0203
D(INF)	-0.001592	0.002896	-0.549803	0.5934
D(INF(-1))	-0.017015	0.005262	-3.233414	0.0080
D(INF(-2))	-0.021060	0.004536	-4.642897	0.0007
D(INF(-3))	-0.015898	0.004517	-3.520032	0.0048
D(ININT)	-1.546296	0.378385	-4.086569	0.0018
D(ININT(-1))	0.974666	0.294700	3.307313	0.0070
D(ININT(-2))	1.712027	0.354121	4.834582	0.0005
D(ININT(-3))	0.863044	0.257928	3.346062	0.0065
D(INEXR)	0.281969	0.131343	2.146807	0.0550
D(INEXR(-1))	-0.146029	0.144594	-1.009921	0.3342

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDDEBT	0.263239	0.080191	3.282641	0.0073
INEDEBT	0.099467	0.061090	1.628217	0.1318
INF	0.029459	0.009856	2.988839	0.0123
ININT	-2.564046	0.415499	-6.170998	0.0001
INEXR	0.860694	0.150692	5.711626	0.0001
C	8.957904	0.939937	9.530326	0.0000

EC = INGFCF - (0.2632*INDDEBT + 0.0995*INEDEBT + 0.0295*INF
-2.5640*ININT + 0.8607*INEXR + 8.9579)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.558747	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
			Finite Sample: n=40	
Actual Sample Size	39			
		10%	2.306	3.353
		5%	2.734	3.92
		1%	3.657	5.256
			Finite Sample: n=35	
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419

APPENDIX 9

ARDL Error Correction Regression
Dependent Variable: D(INGFCF)
Selected Model: ARDL(4, 4, 4, 4, 4, 2)
Case 2: Restricted Constant and No Trend
Date: 11/06/25 Time: 13:49
Sample: 1981 2023
Included observations: 39

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INGFCF(-1))	0.143126	0.097952	1.461179	0.1719
D(INGFCF(-2))	-0.241731	0.123770	-1.953061	0.0767
D(INGFCF(-3))	-0.284802	0.142580	-1.997488	0.0711
D(INDDEBT)	0.416055	0.088401	4.706467	0.0006
D(INDDEBT(-1))	-0.209541	0.134129	-1.562229	0.1465
D(INDDEBT(-2))	-0.327326	0.104992	-3.117631	0.0098
D(INDDEBT(-3))	0.681430	0.098711	6.903317	0.0000
D(INEDEBT)	-0.148109	0.033153	-4.467425	0.0010
D(INEDEBT(-1))	-0.148189	0.053594	-2.765048	0.0184
D(INEDEBT(-2))	-0.079855	0.033521	-2.382219	0.0364
D(INEDEBT(-3))	-0.160549	0.036445	-4.405250	0.0011
D(INF)	-0.001592	0.001250	-1.273630	0.2290
D(INF(-1))	-0.017015	0.003649	-4.663524	0.0007
D(INF(-2))	-0.021060	0.003034	-6.941359	0.0000
D(INF(-3))	-0.015898	0.003135	-5.072030	0.0004
D(ININT)	-1.546296	0.217566	-7.107249	0.0000
D(ININT(-1))	0.974666	0.182942	5.327742	0.0002
D(ININT(-2))	1.712027	0.225978	7.576073	0.0000

D(ININT(-3))	0.863044	0.172019	5.017147	0.0004
D(INEXR)	0.281969	0.056896	4.955898	0.0004
D(INEXR(-1))	-0.146029	0.072934	-2.002205	0.0705
CointEq(-1)*	-0.965912	0.137543	-7.022632	0.0000

R-squared	0.920477	Mean dependent var	0.172885
Adjusted R-squared	0.822243	S.D. dependent var	0.136023
			-
S.E. of regression	0.057349	Akaike info criterion	2.581470
			-
Sum squared resid	0.055911	Schwarz criterion	1.643050
			-
Log likelihood	72.33866	Hannan-Quinn criter.	2.244773
Durbin-Watson stat	2.608861		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.558747	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

APPENDIX 10

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.851867	Prob. F(2,9)	0.1098
Obs*R-squared	15.12851	Prob. Chi-Square(2)	0.0005

Test Equation:

Dependent Variable: RESID

Method: ARDL

Date: 11/06/25 Time: 13:54

Sample: 1985 2023

Included observations: 39

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INGFCF(-1)	0.148832	0.289902	0.513387	0.6200
INGFCF(-2)	0.060536	0.265034	0.228409	0.8244
INGFCF(-3)	-0.071037	0.262925	-0.270181	0.7931
INGFCF(-4)	-0.014181	0.204459	-0.069360	0.9462
INDDEBT	0.011168	0.169185	0.066013	0.9488
INDDEBT(-1)	-0.013357	0.221173	-0.060390	0.9532
INDDEBT(-2)	0.046355	0.300478	0.154272	0.8808
INDDEBT(-3)	-0.033502	0.252162	-0.132858	0.8972
INDDEBT(-4)	-0.020526	0.175802	-0.116757	0.9096
INEDEBT	-0.022726	0.055787	-0.407374	0.6933
INEDEBT(-1)	0.020620	0.094363	0.218517	0.8319
INEDEBT(-2)	-0.002977	0.100961	-0.029489	0.9771
INEDEBT(-3)	0.006766	0.078153	0.086576	0.9329
INEDEBT(-4)	-0.005344	0.055285	-0.096667	0.9251
INF	0.000737	0.002541	0.289845	0.7785

INF(-1)	-0.001074	0.002606	-0.412151	0.6899
INF(-2)	-0.000757	0.002384	-0.317633	0.7580
INF(-3)	-8.92E-06	0.002422	-0.003684	0.9971
INF(-4)	-0.001964	0.004354	-0.451033	0.6626
ININT	0.157044	0.357654	0.439095	0.6709
ININT(-1)	0.041391	0.290853	0.142311	0.8900
ININT(-2)	0.002776	0.202426	0.013712	0.9894
ININT(-3)	0.019080	0.189738	0.100561	0.9221
ININT(-4)	0.047603	0.251019	0.189640	0.8538
INEXR	0.023033	0.114023	0.202005	0.8444
INEXR(-1)	-0.105713	0.188783	-0.559971	0.5892
INEXR(-2)	-0.048496	0.126788	-0.382493	0.7110
C	-1.121935	2.135503	-0.525373	0.6120
RESID(-1)	-0.746675	0.386076	-1.934010	0.0851
RESID(-2)	-0.680286	0.416989	-1.631423	0.1372

R-squared	0.387911	Mean dependent var	-1.83E-16
Adjusted R-squared	-1.584377	S.D. dependent var	0.038358
S.E. of regression	0.061665	Akaike info criterion	-2.662090
Sum squared resid	0.034223	Schwarz criterion	-1.382428
Log likelihood	81.91076	Hannan-Quinn criter.	-2.202958
F-statistic	0.196680	Durbin-Watson stat	2.204318
Prob(F-statistic)	0.999629		

APPENDIX 11

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.844886	Prob. F(27,11)	0.6568
Obs*R-squared	26.31216	Prob. Chi-Square(27)	0.5013
Scaled explained SS	2.980417	Prob. Chi-Square(27)	1.0000

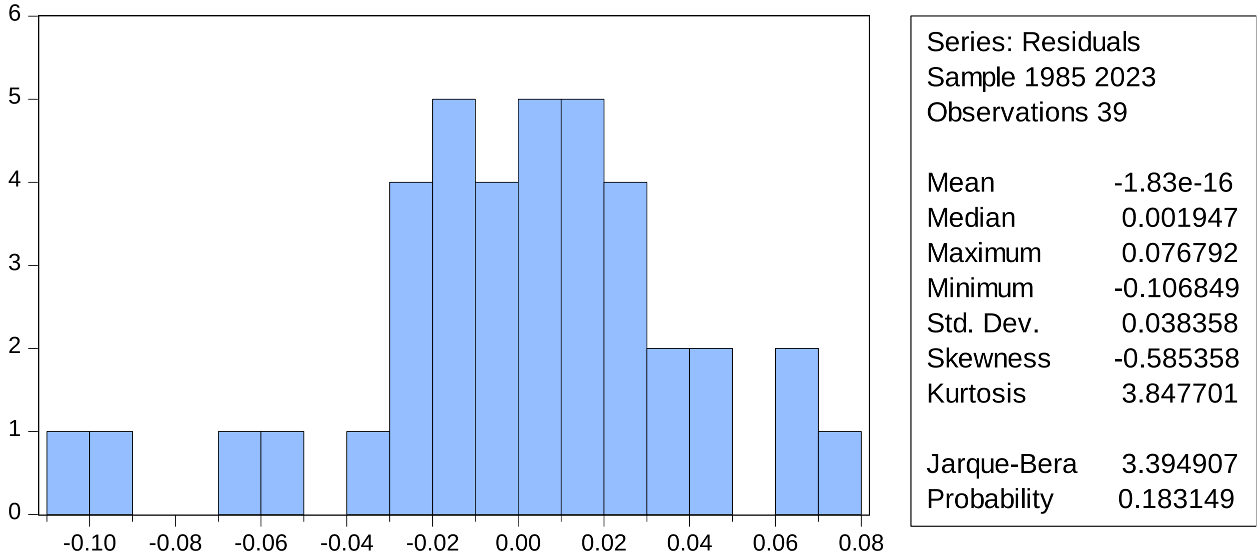
Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/06/25   Time: 13:56
Sample: 1985 2023
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.205621	0.081568	2.520845	0.0284
INGFCF(-1)	-0.018021	0.009031	-1.995391	0.0714
INGFCF(-2)	-0.006376	0.009031	-0.705983	0.4949
INGFCF(-3)	0.010484	0.010235	1.024332	0.3277
INGFCF(-4)	-0.010079	0.008501	-1.185686	0.2607
INDDEBT	0.011755	0.006871	1.710813	0.1151
INDDEBT(-1)	-0.003455	0.009299	-0.371542	0.7173
INDDEBT(-2)	-0.015845	0.012193	-1.299488	0.2204
INDDEBT(-3)	0.016535	0.009716	1.701749	0.1169
INDDEBT(-4)	-0.002366	0.007319	-0.323234	0.7526
INEDEBT	0.000658	0.002201	0.299181	0.7704
INEDEBT(-1)	-0.003937	0.003045	-1.292930	0.2225
INEDEBT(-2)	0.003252	0.003232	1.006105	0.3360
INEDEBT(-3)	-0.003132	0.002718	-1.152249	0.2736

INEDEBT(-4)	-0.000406	0.002160	-0.187840	0.8544
INF	-4.76E-05	0.000106	-0.450826	0.6609
INF(-1)	6.68E-05	0.000102	0.652931	0.5272
INF(-2)	0.000101	9.58E-05	1.055216	0.3140
INF(-3)	-9.28E-05	9.61E-05	-0.964844	0.3554
INF(-4)	0.000317	0.000165	1.926167	0.0803
ININT	-0.037165	0.013790	-2.695072	0.0208
ININT(-1)	-0.002412	0.012025	-0.200571	0.8447
ININT(-2)	-0.002651	0.008349	-0.317535	0.7568
ININT(-3)	0.010449	0.007571	1.380205	0.1949
ININT(-4)	-0.016311	0.009400	-1.735262	0.1106
INEXR	0.002310	0.004787	0.482592	0.6388
INEXR(-1)	0.014775	0.006909	2.138522	0.0557
INEXR(-2)	0.006144	0.005270	1.165999	0.2683

R-squared	0.674671	Mean dependent var	0.001434
Adjusted R-squared	-0.123864	S.D. dependent var	0.002451
			-
S.E. of regression	0.002598	Akaike info criterion	8.897736
			-
Sum squared resid	7.43E-05	Schwarz criterion	7.703384
			-
Log likelihood	201.5058	Hannan-Quinn criter.	8.469212
F-statistic	0.844886	Durbin-Watson stat	3.133761
Prob(F-statistic)	0.656812		

APPENDIX 12


6
5
4
3
2
1
0
-0.10
-0.08
-0.06
-0.04
-0.02
0.00
0.02
0.04
0.06
0.08
Series: Residuals
Sample 1985 2023
Observations 39
Mean -1.83e-16
Median 0.001947
Maximum 0.076792
Minimum -0.106849
Std. Dev. 0.038358
Skewness -0.585358
Kurtosis 3.847701
Jarque-Bera 3.394907
Probability 0.183149

YEAR	GFCF	INT	INF	EDEBT	DDEBT	EXR
1981	124.5242615	8.916666667	20.81282291	2.3312	11.1926	0.617708175
1982	128.0967029	9.5375	7.697747247	8.8194	15.0076	0.673461262
1983	120.2635998	9.976666666	23.21233155	10.5777	22.2214	0.724409851
1984	97.78147934	10.24166667	17.82053329	14.8087	25.6721	0.766527449
1985	87.14484944	9.433333333	7.435344828	17.3006	27.9491	0.893774083
1986	108.865248	9.959166667	5.717151454	41.4524	28.4387	1.754523004
1987	122.4621731	13.96166667	11.29032258	100.7891	36.7891	4.016037344
1988	138.0967701	16.61666667	54.51122478	133.9563	47.0296	4.536966667
1989	217.7498653	20.44166667	50.46668812	240.3937	47.0496	7.364735
1990	262.7655682	25.3	7.364400306	298.6144	84.0931	8.038285
1991	285.5899872	20.04166667	13.0069731	328.4538	116.1987	9.909491667
1992	396.608835	24.75833333	44.58884272	544.2641	177.9617	17.298425
1993	559.145666	31.65	57.16525283	633.1444	273.8364	22.0654
1994	744.0923058	20.48333333	57.03170891	648.813	407.5827	21.996
1995	1153.471382	20.23333333	72.8355023	716.8656	477.73389	21.89525833
1996	1494.750892	19.83666667	29.26829268	617.32	419.9756	21.884425
1997	1697.76782	17.795	8.529874214	595.9319	501.7511	21.88605
1998	1948.654373	18.18416667	9.996378124	633.017	560.8302	21.886
1999	2098.535642	20.29	6.618373395	2577.3744	794.8066	92.3381
2000	2404.816238	21.27416667	6.933292156	3097.3839	898.2539	101.6973333
2001	2473.472552	23.43833333	18.87364621	3176.291	1016.974	111.23125
2002	3078.783701	24.77083333	12.8765792	3932.8848	1166.0007	120.5781583
2003	3846.234881	20.71416667	14.03178361	4478.3293	1329.6845	129.22235
2004	4723.719874	19.18083333	14.99803382	4890.2696	1370.3252	132.888025

2005	5772.637188	17.94833333	17.86349337	2695.0722	1525.9066	131.2743333
2006	7948.121108	16.89333333	8.22522152	451.4617	1753.2591	128.6516667
2007	6997.618205	16.93916667	5.388007969	438.8908692	2169.63763	125.8081083
2008	7535.271353	15.13583333	11.58107517	523.254088	2320.30716	118.5666667
2009	9177.084568	18.99083333	12.53782773	590.437134	3228.029016	148.88
2010	9183.059443	17.585	13.74005214	689.8374882	4551.821888	150.2975
2011	9897.19718	16.02	10.82613719	896.8496166	5622.843212	153.8625
2012	10281.95175	16.79166667	12.2242413	1026.903923	6537.536305	157.5
2013	11478.08009	16.7225	8.495518383	1387.331994	7118.978853	157.3116667
2014	13593.77978	16.54833333	8.04741088	1631.5	7904.025474	158.5526417
2015	14112.16984	16.84916667	9.00943498	2111.51	8836.995859	192.4403333
2016	15104.18437	16.86801576	15.69681264	3478.9154	11058.2043	253.492
2017	16908.13314	17.55333333	16.50226621	5787.51264	12589.48914	305.7901092
2018	24550.24317	16.90389696	12.09510652	7759.23159	12774.4057	306.0836882
2019	35863.97928	15.37658698	11.39642234	9022.42164	14272.64479	306.9209515
2020	41253.54844	13.64202167	13.24602343	12705.61848	16023.88538	358.8107973
2021	58293.94893	11.48313279	16.95284572	15855.23125	19242.55711	401.1520292
2022	65227.13331	12.33454424	18.84718778	18702.25188	22210.3646	425.9791581
2023	82889.22423	14.01055373	24.6595502	38219.84944	53258.01188	645.1940679

Source: Central Bank of Nigeria (CBN) Statistical Bulletin