

**THE IMPACT OF PUBLIC DEBT ON ECONOMIC GROWTH IN NIGERIA**

**BY**

**MICHAEL DOUGLAS NGOZI**

**SSC1909378**

**DEPARTMENT OF ECONOMICS  
FACULTY OF SOCIAL SCIENCES  
UNIVERSITY OF BENIN  
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**BEING A PROJECTC SUBMITTED TO THE DEPARTMENT OF ECONOMICS,  
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## CERTIFICATION

This is to certify that this project titled “**THE IMPACT OF PUBLIC DEBT ON ECONOMIC GROWTH IN NIGERIA**” was carried out by Michael Douglas NGOZI. with matriculation number **SSC1909378**. It has been read and recommended for acceptance in partial fulfilment of the requirement for the award of Bachelor of Science (B.Sc.) Degree in Economics.

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Mr. Isuwa Festus Dading  
(Project Supervisor)

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Dr. Sunday O. Igbinedion  
(Project Co-ordinator)

**Date:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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**Dr. Nosakhare A. Arodoye**  
(Ag. Head of Department)

**Date:** \_\_\_\_\_

## DEDICATION

This project is dedicated to **God Almighty**, the one by whom all things exist, and by whom I have reached this great milestone. Also, to my dear parents, **Mr. Douglas Chukwudi Obi (Snr.)** and **Ms. Forstina Imade Ighile**, both of whom struggled endlessly to see to by academic success, I am perpetually grateful.

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## ABSTRACT

*This study investigates the relationship between public debt and economic growth in Nigeria from 1980 to 2022, focusing on GDP dynamics, inflation, exchange rates, and institutional factors. Against the backdrop of Nigeria's rising debt-to-GDP ratio—projected to exceed 46% by 2025—the research addresses conflicting theoretical debates on whether public debt stimulates growth through investments or stifles it via fiscal instability. Employing a mixed-methods approach, the study combines quantitative analysis of time-series data (sourced from the IMF, World Bank, and Central Bank of Nigeria) with qualitative insights from policy documents. Econometric techniques, including OLS regression, ADF unit root tests, and Johansen cointegration analysis, are applied to evaluate the impact of debt on macroeconomic performance.*

*Results indicate a significant positive relationship between total public debt and GDP growth, suggesting that strategic borrowing for infrastructure and human capital development can enhance economic outcomes. The study concludes that sustainable debt management requires institutional reforms, diversified revenue streams, and transparent allocation of borrowed funds. These findings offer actionable insights for policymakers seeking to balance debt-driven growth with long-term fiscal stability in resource-dependent economies.*

## CHAPTER ONE

### INTRODUCTION

#### 1.1. Background to the Study:

Nigeria's management of its public debt is crucial for its economic health. As a major African economy and oil exporter, how the government handles borrowing directly impacts the nation's stability and growth. Nigeria's debt levels fluctuate due to factors like budget deficits and external

economic shocks. It's vital for policymakers and economists to understand how this debt affects economic growth to make informed decisions and create effective debt management strategies.

Public debt, the total amount the government owes, is a key element of its financial policies and significantly influences economic growth and sustainability. In Nigeria, with its abundant resources and growing population, managing this debt is a major concern. It has the potential to affect various aspects of the economy, including GDP, inflation, currency exchange rates, and overall financial stability.

Nigeria's economic development is shaped by many factors, such as changing oil prices, population shifts, and government decisions. Therefore, understanding the impact of public debt on economic growth is essential for policymakers, economists, and other stakeholders. How the government manages its debt determines its ability to fund operations, invest in infrastructure, and stimulate the economy.

The importance of investigating the relationship between public debt and economic growth in Nigeria cannot be overstated. As the government continues to grapple with various socio-economic challenges, including infrastructure deficits, unemployment, and poverty, the role of public debt in financing development projects and stimulating economic activity becomes increasingly pertinent. Moreover, with Nigeria's debt levels rising in recent years, there is a pressing need to assess the implications of this trend on the country's macroeconomic stability and long-term growth prospects.

Therefore, this research seeks to delve into the intricacies of public debt management and its impact on Nigeria's economic growth. By analyzing empirical data and employing econometric techniques, this study aims to shed light on the mechanisms through which public debt influences key macroeconomic indicators. Specifically, the research will examine the effects of public debt on economic growth.

However, while these studies provide important insights, they often overlook the nuanced channels through which public debt affects economic growth. Moreover, existing literature tends to rely heavily on aggregate debt-to-GDP ratios as a measure of debt sustainability, overlooking the composition and structure of debt, as well as its maturity profile. This oversimplification may mask underlying vulnerabilities and fail to capture the full extent of risks associated with public debt accumulation.

Furthermore, the literature on public debt in Nigeria often lacks a nuanced understanding of the institutional and structural factors that shape debt management practices and outcomes. Factors such as governance quality, institutional capacity, and political economy dynamics play a crucial role in determining the effectiveness of debt management strategies and their impact on economic growth.

To address these gaps and limitations, this research aims to provide a comprehensive analysis of the impact of public debt on economic growth in Nigeria. By examining a broader set of macroeconomic indicators and considering the institutional context, this study seeks to offer a more nuanced understanding of the dynamics between public debt dynamics and economic outcomes. Additionally, by employing advanced econometric techniques and incorporating disaggregated debt data, this research aims to provide more robust empirical evidence to inform policy decisions and enhance debt management practices in Nigeria.

## **1.2. Statement of Research Problem:**

Public debt in Nigeria is escalating, raising concerns about its impact on economic growth, inflation, and exchange rate stability in the country. Despite efforts to address the debt burden, Nigeria's debt portfolio continues to grow prompting questions about its potential effects on the economy. Theoretical and empirical literature presents conflicting views on the relationship between public debt and economic indicators, highlighting the need for a nuanced examination of Nigeria's unique context.

Nigeria's public debt has been rising steadfastly, with a significant increase in recent years. The debt-to-GDP ratio has surged from 21.68% in 2015 to 34.98% in 2021, exceeding the recommended threshold of 30% for developing countries. Most recently, the International Monetary Fund (IMF) projected Nigeria's public debt-to-GDP ratio to reach 46.6 percent in 2024, and 46.8 percent in 2025. According to the IMF, large shares of loans on concessional terms, high inflation, and resulting favorable interest-growth differentials had helped contain average public debt-to-GDP ratios in low-income developing countries, at around 50 percent of GDP since 2020, on average.

It added: "An exception was an uptick to 53 percent of GDP in 2023, largely driven by exchange rate depreciation in Nigeria. However, countries are carrying heavy debt-service burdens, amounting to 13 percent of total spending and almost 25 percent of tax revenues, on average, in 2023 (about double the level 15 years ago). In Nigeria, the debt-service burden amounts to around 56 percent of tax revenues. Such high debt-servicing costs prevent low-income developing countries from spending more on essential services and critical investment to improve economic resilience and reduce poverty." This rapid growth in public debt has raised concerns about its sustainability and potential implications for economic performance, inflation dynamics, and exchange rate stability.

The impact of public debt on economic growth is a contentious issue in economic discourse. Some argue that public debt can stimulate economic growth by financing productive investments, while others contend that high levels of public debt can crowd out private investment, lead to debt servicing difficulties and hinder economic growth.

Similarly, the relationship between public debt and inflation is complex and debated. Some argue that public debt can lead to inflation by increasing the money supply and aggregate demand, while others contend that inflation can be managed through monetary policy, regardless of public debt levels.

Furthermore, the impact of public debt on exchange rates is also a topic of discussion. Some argue that high levels of public debt can lead to currency depreciation and exchange rate volatility, while others contend that exchange rates are influenced by a range of factors, including monetary policy, trade balances, and political stability.

Given the conflicting views in the literature and the growing concern about Nigeria's public debt, this research aims to investigate the impact of public debt on economic growth, inflation dynamics, and exchange rates in Nigeria.

### **1.3. Research Objectives:**

The main objective of the study is to examine the impact of public debt on economic growth in Nigeria.

The specific objectives of this study are as follows:

- I. To empirically assess the impact of public debt on GDP growth in Nigeria.
- II. To investigate the relationship between public debt and inflation rates in Nigeria.
- III. To analyze the effects of public debt on exchange rates and external balance in Nigeria.
- IV. To identify the institutional and structural determinants of public debt management practices in Nigeria.

### **1.4. Research Questions:**

Based on the above-mentioned problems, this study seeks to answer the following questions:

- I. Does Public debt have any impact on economic growth in Nigeria?
- II. Does public debt affect inflation rates in Nigeria?
- III. Does public debt have an impact on exchange rate in Nigeria?

IV. Are there institutional and structural factors that determine public debt management practices?

### **1.5. Hypotheses of the study:**

- H0: There is no relationship between public debt and economic growth in Nigeria.

H1: There is a positive relationship between public debt and economic growth in Nigeria, indicating that higher levels of public debt can lead to investments in infrastructure, education, etc., which can stimulate economic growth.

- H0: There is no relationship between public debt and inflation rates in Nigeria.

H1: There is a negative relationship between public debt and inflation rates in Nigeria, suggesting that higher levels of public debt contribute to inflationary pressures.

- H0: There is no relationship between public debt and exchange rates in Nigeria.

H1: There is a positive relationship between public debt and exchange rates in Nigeria, indicating that higher levels of public debt leading to investments in key sectors of the economy can also lead to a favourable exchange rate by enhancing export competitiveness through import substitution, and making the country's goods cheaper for foreign buyers. This can boost exports, improve the trade balance and contribute positively to the country's GDP.

This research intends to achieve a deeper understanding of the complex relationship between public debt and economic growth in Nigeria. By testing these hypotheses and analyzing empirical data, this research aims to provide evidence-based insights that can inform policy decisions and enhance debt management practices in Nigeria. Ultimately, this research endeavors to contribute to the existing body of knowledge on public debt management and macroeconomic policy, with the ultimate goal of promoting sustainable economic development and stability in Nigeria.

### **1.6. Scope of the Study:**

This study employs a mixed-methods approach, combining both quantitative and qualitative analyses to investigate the impact of public debt on economic growth in Nigeria within the timeframe of 1980-2022.

Quantitative data for this study will be collected from various sources, including the World Bank, International Monetary Fund (IMF), Central Bank of Nigeria (CBN), and other relevant national

and international databases. The dataset will include time-series data on key macroeconomic variables such as public debt levels, GDP growth rates, inflation rates, exchange rates, etc. Additionally, qualitative data will be gathered through a review of relevant literature, policy documents, and reports from governmental and non-governmental organizations.

### **1.7. Significance of the Study:**

The findings of this research hold significant implications for policymakers, economists, and stakeholders involved in public debt management and macroeconomic policy formulation in Nigeria. By providing empirical evidence on the relationship between public debt and economic growth, this study can inform decision-making and enhance the effectiveness of debt management strategies.

Firstly, the research findings can contribute to the existing body of knowledge on public debt dynamics and macroeconomic outcomes in Nigeria. This study offers a more comprehensive understanding of the complex interactions between public debt and economic growth. Additionally, the inclusion of qualitative insights on institutional factors enriches the literature on debt management practices and governance issues in Nigeria.

Practically, the research findings can inform policy interventions aimed at promoting sustainable economic development and stability in Nigeria. By identifying the potential risks and benefits associated with different debt management strategies, policymakers can make more informed decisions regarding borrowing, expenditure prioritization, and fiscal consolidation efforts. Moreover, the findings can guide efforts to strengthen institutional capacity and governance frameworks for debt management, thereby enhancing transparency, accountability, and efficiency in public financial management.

### **1.8. Limitations of the Study:**

The limitations of this study include data limitations, it relies on secondary data from the IMF, which may have limitations in terms of accuracy, completeness, and timeliness. Additionally, the study's focus on Nigeria may not be generalizable to other low-income developing countries with different economic and political contexts. The study's timeframe, which only considers up to 2022, may not reflect the current or future situation. Furthermore, the study assumes that the data from the IMF (and other sources) is reliable and accurate, which may not always be the case. Moreover, the study lacks a control group and has a limited sample size, only considering Nigeria.

## **1.9. Structure of the Study:**

There are five chapters in this study, this being the first chapter giving an introduction to the study. The other chapters are as follows: chapter two deals with the review of relevant literature. The third chapter addresses the theoretical framework, model specification, and methodology. Chapter four comes with the data, presentation, analysis, and interpretation of results. Finally, the fifth and last chapter concludes the study with a summary of the findings of this study, recommendations, and the conclusion.

By following this structure, the paper aims to provide a comprehensive analysis of the impact of public debt on economic growth in Nigeria, offering valuable insights for policymakers, researchers, and other stakeholders in the field. The major objective of the study is to investigate the effects of public debt on economic growth. The scope of the study covers the years between 2000 to 2022; at least to cover a long range of periods up to 23 years, for valid and reliable outcomes.

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## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **INTRODUCTION:**

Public debt and economic performance are intricately linked, with research suggesting both positive and negative effects. High levels of public debt can lead to increased government borrowing costs and crowd out private investment, moderate debt can finance growth-enhancing investments. In this section, we shall explain the above position, and as well review the conceptual literature, the theoretical foundation, and the related empirical literature review on public debts and fixed capital formation.

#### **2.1. CONCEPTUAL LITERATURE:**

##### **2.1.1. MEANING OF PUBLIC DEBT:**

Public debt, also known as national debt, refers to the money a government borrows to cover expenses that exceed its revenue. When a government spends more than it collects as revenue (through taxes and other income), it needs to bridge the gap by borrowing money. This borrowing can take various forms, such as issuing bonds, taking loans from international organisations like the IMF or World Bank, or borrowing from other countries.

According to Wikipedia (2024), Public debt, also known as government debt, is the financial liabilities of the government sector. (IMF, 2014) Changes in government debt over time reflect primarily borrowing due to past government deficits. A deficit occurs when a government's expenditures exceed revenues. Public debt may be owed to domestic residents, as well as foreign residents. If owed to foreign residents, that quantity is included in the country's external debt.

Cecchetti, Mohanty and Zampali (2011) stated that public debt is used to mean total gross debt and is often referred to as "total debt liabilities". They defined it as a financial claim that requires payment of interest and/or principal by the debtors to the creditor at a date or dates in the future.

Public debt arises from the inability of revenue from taxes to match projected expenses. In other words, when government embark on budget deficits, public debt comes in handy as one of the instruments used to cover those budget deficits. It is a set of state obligations to third parties, and falls into either one of two categories, namely domestic debt when the debt is issued on the domestic market, and external debt when it is issued on the foreign market, regardless of the currency and the nationality of the creditors.(Lopes and Ferreira, 2014)

#### TYPES OF PUBLIC DEBT:

The two major types of public debt are: Internal (Domestic) and External (Foreign) Debt.

Public loans floated within the country are called Internal debt. Public borrowings from other countries are referred to as External debt. External debt represents a claim of foreigners against the real income (GNP) of the country, when it borrows from other countries and has to repay at the time of maturity. External public debt permits import of real resources. It enables the country to consume more than it produces.

## I. Domestic Debts:

Okorie & Cookey, (2020) opines that domestic debts refer to the portion of a country's debt borrowed from within the confines of the country. In other words, they are debts owed by the government to lenders within the geographical borders of the same country. These lenders could include individuals, commercial banks and even the central bank of the country. In a bid to fulfill its fiscal obligations in a time of shortage of funds, the government could sell treasury bills and other debt instruments to the citizens or resort to the central bank as lender of last resort.

## II. External Debts:

These are debts in which the government owe to creditors outside the borders of its country. These creditors include commercial banks in other countries that constitute the London Funds, Governments of other countries that constitute the Paris Funds, and multinational agencies like the World Bank and the International Monetary Fund (IMF).

Both domestic and external debts have various impacts on the Economy. However, relatively, external debts bear more complexities and detrimental consequences especially when not properly managed (Marvelous et al., 2020). There could exist:

### i. Fiscal Space Constraints:

High debt levels can limit the government in investing in highly needed public services or even in times of economic crisis (Abindaw Nabieu et al., 2023).

### ii. Susceptibility to External Shocks:

Such shocks as changes in the global interest rates and liquidity, currency depreciation, and economic turmoil in creditor countries can hit quite heavily even on lucrative countries and compromise the sustainability of a debtor to settle its debt (Gopinath, 2024).

### iii. Debt Trap:

Difficulty in repaying loans already taken results in a more intricate situation for the country to exit from the debt-burdened situation and can become a vicious cycle. It, therefore, becomes an issue of striking the balance in the management of sound debt strategies so that the prospective benefits accruing from external debt are taken advantage of while at the same time curbing associated risks (Rodney & Mincey, 2020).

Other types of public debt include:

III. Productive and Unproductive Debt: Public debt is said to be productive or unproductive, when government loans are invested in productive assets or enterprises such as railways, irrigation, multipurpose projects, etc., which yield a sufficient income to the public authority to pay out annual interest on the debt as well as help in repaying the principal in the long run. As such, a productive debt is self-liquidating in nature; so the community experiences no net burden of such debt. An unproductive debt, on the other hand, is one which does not add to the productive assets of a country. When the government borrows for unproductive purposes like financing a war, or for lavish expenditure on public administration, etc., such loans are regarded as unproductive.

IV. Short-term, Medium-term and Long-term Loans: According to their duration, loans may be classified as short-term, medium-term or long-term debts. Short-term debts mature within a short period extensively used as a means of short-term (usually 90 days) borrowing by the government, of 3-9 months. For instance, Treasury bills are an instrument of credit government, generally, for the covering of temporary deficits in the budgets. Interests on such loans are generally low.

Long-term debts, on the other hand, are those repayable after a long period of time, generally, ten years or more. For development finance, such loans are usually raised by the government. Long-term loans usually bear a high rate of interest.

Similarly, loans of medium-term (in between short-term and long-term) are floated by the government, bearing intermediate interest rates. For war finance, or to meet expenditure on education, health, relief work, etc., such loans are generally preferred.

V. Redeemable and Irredeemable Debts: On the criterion of maturity, public debts may be classified as redeemable or irredeemable. Loans which the government promises to pay off at a future date are called redeemable debts, the government has to make some arrangement for their repayment. They are, therefore, terminable loans. Whereas loans for which no promise is made by the government regarding the exact date of maturity, and all that the government does is to agree to pay interest regularly for the bonds issued, are called irredeemable debts.

### **2.1.2. Meaning of Inflation Rates:**

Inflation refers to the rate at which the general price level of goods and services in an economy rises over a specific period, typically measured annually. Empirical research utilizes

various indicators to quantify inflation, such as consumer price indices (CPI), producer price indices (PPI), and GDP deflators.

In empirical studies analyzing inflation rates, researchers often utilize econometric models to identify determinants of inflation. For instance, Barro (1996) explores the relationship between inflation and economic growth, highlighting the detrimental effects of high inflation on long-term economic performance. Additionally, Mishkin and Schmidt-Hebbel (2007) investigate the effectiveness of inflation targeting frameworks in stabilizing inflation and promoting macroeconomic stability.

Furthermore, Blanchard and Summers (1986) empirically examine the phenomenon of hysteresis in unemployment, suggesting that persistent inflation can lead to structural unemployment. This highlights the importance of controlling inflation for maintaining sustainable employment levels.

Empirical studies also investigate the effects of inflation on various economic variables, including consumption, investment, savings, and income distribution. For instance, research may examine how high inflation erodes purchasing power, redistributes wealth, and distorts resource allocation.

### **2.1.3. Meaning of Exchange Rates:**

Exchange rate refers to the value of one currency relative to another, determining the price at which currencies can be exchanged. Empirical research on exchange rates often involves analyzing currency pairs in the foreign exchange market using time-series data.

Empirical research on exchange rates often employs time-series analysis and econometric

techniques to understand the determinants of currency movements. Engel and West (2005) investigate the relationship between exchange rates and fundamental economic variables, such as interest rate differentials and trade balances, providing insights into the factors driving exchange rate fluctuations.

Meese and Rogoff (1983) conduct an empirical assessment of exchange rate models, evaluating their predictive power out-of-sample. Their findings shed light on the challenges of forecasting exchange rate movements and the limitations of traditional economic models in capturing the complexities of currency markets.

Additionally, Frankel and Rose (1995) offer a comprehensive review of empirical research on nominal exchange rates, synthesizing findings from various studies to elucidate the factors influencing exchange rate dynamics and the implications for international trade and investment.

Empirical studies also investigate the impacts of exchange rate fluctuations on trade flows, foreign direct investment (FDI), international competitiveness, inflation dynamics, and economic stability. For instance, research may examine how exchange rate volatility affects export competitiveness or import prices.

#### **2.1.4. Economic Growth**

Economic growth denotes a hallmark of the prosperity of nations. Economic growth is simply taken to mean a sustained growth in the production of goods and services in the economy for some period. Numerically, it is recorded in terms of the growth rate of the Gross Domestic Product (GDP), whereby the concept represents a total market value for all final goods and services produced in an economy (Charles, 2024). Knowledge about the determinants of economic growth

is not only relevant to policymakers but also individuals as it formulates a starting point for:

### **I. Improved Living Standard**

The growth in the economy shall enhance the average income, and the people may be in a state of trying to chase after an improved living standard.

### **II. Employment Opportunity Creation**

The expanding economy normally translates into the providing of employment to labour, which in turn reduces the rate of unemployment.

### **III. Improved Infrastructure**

Increased resources available through investment would also extend to cover infrastructure development, whether transportation, communication system and power.

In other words, if there is economic development, research and development will later be encouraged, if technology further develops, it would lead to economic development. The ways in which growing economies reach and maintain much more complicated economic growth, though, is greatly a matter of different views. Some of the key drivers of Economic growth are as follows:

- **Factor Inputs**

- **Labour**

In terms of economic development, a growing and prosperous work force has to be developed scientifically. All the major factors contributing to the economic development, like education, health facilities, training, etc., directly contribute to enhancing the skills and talents of the workforce.

- **Capital**

It refers to the physical capital, like machinery and factories, transportation networks; accompanied by human capital in terms of knowledge, skills, and experience, both are very important in efficient production. Mostly, it contributes to the accumulation of capital through the building of infrastructure and education.

## **2. Technological Advancement**

Technological advancement plays a vital role; New technologies have a way of automating work, making it highly efficient, and above all, they provide the possibility of producing new goods and services. By helping to reduce costs, technological advancements in production can improve access to goods and services. It can also spark innovations which will usher in new industries and also new products that will inspire economic growth (Burgess & Connell, 2020).

## **3. Institutional Framework**

There is a perceived security in the stable and foreseeable framework of the law and the political setting which in turns adds to the confidence on the part of businesses and individuals, and meanwhile buttresses investment and entrepreneurship. Likewise, a sound Fiscal and monetary policies imposed by the government make up the very basis for the stable and desirable growth within the economy. Fiscal policies, including taxations and government spending, offer prospects for engagement in the adjustment of aggregate demand and investment spending, while, through interest rate changes, monetary policies of a state can influence the level of credit available and investment opportunities. Trade and investment openness can open paths to international markets and foreign technologies needed to help generate economic growth (Adegboyo et al., 2021).

Part of the scope of this research promised to reflect on the institutional and structural factors that shape debt management practices and outcomes in Nigeria. Below is a definition of these concepts;

#### STRUCTURAL FACTORS:

Structural factors refer to the inherent characteristics and fundamental aspects of an economy that influence its functioning and performance. These factors include the economic structure, demographic trends, and political environment, which collectively shape a country's economic policies and debt management capabilities.

#### Political Instability:

Impact on Policy Consistency: Frequent changes in government and political instability can lead to inconsistent economic policies, disrupting long-term debt management strategies. Political turbulence can undermine investor confidence, increase risk premiums, and elevate borrowing costs.

Example: Political instability can result in abrupt shifts in fiscal policy, such as changes in taxation or public spending priorities, complicating the execution of cohesive debt management plans.

#### Economic Structure:

Dependence on Oil Exports: Nigeria's heavy reliance on oil exports makes its economy susceptible to global oil price fluctuations. Such volatility can destabilize revenue streams, complicating debt servicing, and increasing the risk of debt distress.

Limited Diversification: A lack of economic diversification limits the government's ability to generate stable revenues from non-oil sectors, exacerbating fiscal vulnerabilities and complicating debt management efforts.

Example: A sudden drop in oil prices can significantly reduce government revenues, leading to increased borrowing to cover budget deficits and higher debt levels.

Demographic Factors:

Population Growth: Rapid population growth, particularly the youth bulge, places additional pressure on government resources for social services like education, healthcare, and infrastructure. This can lead to increased borrowing to meet these needs.

Example: The need to invest in human capital and infrastructure to support a growing population may compel the government to incur additional debt, affecting long-term debt sustainability.

INSTITUTIONAL FACTORS:

Institutional factors pertain to the formal and informal rules, regulations, and organizations that shape the economic and political environment within which public debt is managed. These include the strength of legal frameworks, governance quality, transparency, and the capacity of institutions responsible for debt management.

Weak Institutional Framework:

**Legal and Regulatory Gaps:** Inadequate legal and regulatory frameworks can hinder effective public debt management. A lack of clear regulations and enforcement mechanisms can result in poor debt accountability and management practices.

**Example:** Weak legal structures may lead to uncoordinated borrowing by different levels of government, increasing overall debt without a comprehensive strategy.

**Corruption and Transparency:**

**Inefficient Use of Funds:** Corruption and lack of transparency in government operations can lead to the misallocation of borrowed funds, reducing the effectiveness of public investments and increasing debt burdens.

**Example:** Corruption can result in inflated project costs and substandard infrastructure, diminishing the economic returns on debt-financed projects and complicating debt repayment.

**Central Bank Independence:**

**Monetary Policy Impact:** The Central Bank of Nigeria's (CBN) independence and autonomy are crucial for effective monetary policy, which directly impacts public debt management. A strong, independent CBN can help manage inflation and interest rates, supporting sustainable debt levels.

**Example:** An autonomous CBN can implement policies to stabilize the currency and control inflation, reducing the cost of debt servicing.

**Fiscal Responsibility:**

Implementation of Fiscal Laws: Enacting and enforcing fiscal responsibility laws and regulations can foster fiscal discipline, ensuring that borrowing is aligned with long-term economic goals and sustainability.

Example: Fiscal responsibility laws can cap the amount of permissible government borrowing, promoting prudent debt accumulation practices.

Debt Management Office (DMO) Capacity:

Expertise and Effectiveness: The capacity and expertise of Nigeria's Debt Management Office are critical for effective public debt management. A well-equipped DMO can design and implement comprehensive debt strategies, monitor debt levels, and negotiate favorable borrowing terms.

Example: A capable DMO can engage in proactive debt management, including debt restructuring and risk mitigation strategies, to maintain sustainable debt levels.

Impact on Public Debt Management Practices and Outcomes:

Debt Accumulation and Sustainability:

Influence of Structural and Institutional Factors: Political instability, economic dependence on oil, and demographic pressures can drive debt accumulation, while weak institutional frameworks and corruption can undermine debt sustainability.

Example: The interplay of these factors may lead to rapid debt accumulation without adequate safeguards, jeopardizing long-term fiscal stability.

Interest Rate and Exchange Rate Management:

Monetary Policy and Central Bank Role: The independence of the CBN and effective monetary policy are crucial for managing interest rates and exchange rates, which directly affect the cost of debt servicing.

Example: Effective management of interest and exchange rates can lower borrowing costs and stabilize debt repayments, reducing the risk of default.

Fiscal Discipline and Budgeting:

Role of Fiscal Responsibility Laws: Implementing fiscal responsibility laws can promote fiscal discipline, ensuring that government borrowing aligns with sustainable budgeting practices.

Example: Such laws can prevent excessive borrowing, enforce budgetary controls, and enhance transparency in public financial management.

Economic Growth and Development:

Investment in Productive Sectors: Efficient use of borrowed funds for productive investments, such as infrastructure and human capital development, can spur economic growth, enhancing the government's capacity to manage debt.

Example: Strategic investment in sectors that yield high economic returns can generate additional revenues, improving debt repayment capacity and fostering long-term development.

## **2.2. THEORETICAL LITERATURE:**

While there may not be entirely new theories specific to Nigeria regarding the impact of public debt on economic performance, there are contemporary frameworks and approaches that can enhance our understanding of this relationship in the Nigerian context:

### **I. Debt Overhang Theory**

According to the debt overhang theory, a probable consequence of over-accumulating debt can harm investment and growth within an economy. It merely means that the accumulated debt by a country can overhang in uncertainty and block the economy in various dimensions. Debt overhang is a state of affairs whereby the existing indebtedness is so heavy that the borrower cannot take new loans or make new fresh investments in potentially profitable areas. It arises if the returns anticipated from new investments are not sufficiently high to cater for the costs of servicing the already existing debt, and the borrower is therefore discouraged from making new investments (Abdullahi et al., 2016). A high level of debt causes uncertainty in the economy and cripples investor's confidence as it raises doubts among investors and creditors about a country's ability to repay in the future. Such increased uncertainty, in turn, may put upward pressure on a government's borrowing costs as investors increasingly demand higher rates of interest to cover the perceived risk of default. Furthermore, that increased degree of uncertainty could spill over to the private sector and reduce investment, as firms may simply postpone or scale down their investment plans out of concern for economic stability and future tax burden (Yusuf & Mohd, 2021). Crowding out of productive investment in such instances, a government accumulating huge debt often pays a great share of its budget to service this debt in interest payments. These are resources that would have been used in other productive investments such as infrastructures, education, research, among

others. Crowding out of productive investment is likely to slow down economic growth since it hampers significant economic infrastructures and human capital development which are key to long-term success (Ahmed, 2000). High levels of debt exacerbate fiscal imbalances in which case governments adopt austerity measures or increases taxes to service the debts, which in turn may further suppress economic activities because of declines in disposable income and aggregate demand. In addition, it may not make it possible for the government to actively implement countercyclical fiscal policy to get out of a recession and alleviate unemployment because it would always have to be concerned with servicing the debt first. There is a highly cohesive negative feedback loop linking uncertainty, diminished investment, and fiscal stinginess. Slower economic growth frequently results in lower government revenues and borrowing, which makes the debt overhang problem even worse (Abotsi, 2023).

At its most dangerous, the feedback loop spirals into a full-blown debt crisis, where the government's ability to pay the obligations of its debt is depleted, hence, instability within the financial system may follow.

The classic solution to the debt overhang problem is through fiscal consolidation and structural reforms to increase the competitiveness and performance of the economy. This would in turn restore confidence to the investor. In some cases, governments will need to pursue prudent fiscal policies, including debt restructuring, rationalization of expenditure, and revenue enhancement, to put the debt on a sustainable trajectory and create conditions that are conducive to economic growth (Andrés et al., 2017). In brief, the debt overhang theory underlines the adverse implications of huge debt on economic growth and investment, and it underpins the critical importance of fiscal discipline, sound Economic management, and policy reforms in taming the negative consequences of such debts for the actualization of sustainable development.

## **II. Ricardian Equivalence Theory**

Ricardian equivalence theory states that individuals make future rational economic decisions, even in response to government fiscal policy. It posits that changes in government borrowing and debt have little to no effect on aggregate demand or economic impacts since people will already have looked into the future and seen the rise or fall of taxes with which the debt will be repaid. The theory opposes the traditional view of increasing government borrowing and debt-financed spending as being able to stimulate economic activity, especially in a recession (Boyle, 2020). In principle, Ricardian equivalence argues that an individual, acknowledging increased government borrowing to finance expenditures such as infrastructure projects, tax cuts, or welfare programs, would adjust his behavior to account for future tax liabilities necessary to pay off these debts. That is to say, people realize that deficits today imply higher future taxes to pay off the debt and are hence forward-looking in their consumption and saving decisions (Isah et al., 2022). Borrowing by the government, which raises public debt further, brings no noticeable consumer reaction under Ricardian equivalence, as an individual will respond to a change in fiscal policy by saving more in anticipation of future tax burdens. In other words, changes in government spending financed by debt do not bear on aggregate demand or economic activity since the increase in government spending is compensated for by an equivalent reduction in private consumption or investment (Yusuf & Mohd, 2021).

While theoretically, the Ricardian equivalence theorem is an elegant concept, it has also undergone a lot of flak and empirical debate. For example, proponents argue that people are not fully informed or are not capable of predicting how the tax system may change in the future, and even if they do, they may not be in a position to judge the extent to which they have to change their behavior. Other aspects, such as liquidity constraints, uncertainty, and imperfect capital markets, may also restrain

the capacities of individual human beings in the realm of consumption smoothing over time. On the other hand, empirical studies of Ricardian equivalence yield very mixed results, namely, confirmation of partial equivalence or unambiguous rejection. This may be a function of factors such as the degree of fiscal transparency, the credibility of government commitments to fiscal sustainability, and the economic environment (Jaafar & Ismail, 2019).

### **Implication**

How relevant Ricardian equivalence is for policy will therefore, depend on individuals' anticipation and their responsiveness to changes in government borrowing. If the Ricardian equivalence hypothesis is right, then deficit spending on the part of the government would be the last thing to help economic activity because it could be an ineffective stimulus and could have undesirable long-run consequences, such as higher future tax burdens and crowding out of private investment. In sum, Ricardian equivalence is basically a theory that challenges this conventional wisdom on the stimulative effect of government borrowing and underscores the importance of how people perceive and respond to changes in fiscal policy. Its policy implications are also a matter of controversy. The Ricardian equivalence opens an invaluable window into the intricate interaction that exists among government debt, taxation, and individual behavior.

### **III. Keynesian Theory**

The Keynesian theory offers an insight into the role of public debt in achieving macroeconomic goals such as full employment, price stability, economic growth, etc. The theory came into the limelight after the economic collapse caused by the Great Depression of the 1930s. Propounded by John Maynard Keynes, the theory advocates for the use of fiscal policy including deficit budgeting and public debt issuance, as tools to manage fluctuations in economic activity. For Keynes, large volume of debts should be seen as an asset which can be used by the government in

periods of economic downturns and when private investments are insufficient to stimulate the economy towards recovery (Salsman, 2017).

He went further to explain that public debt issuance and its use could cause some effects, such as;

### **Multiplier Effect:**

Keynesian theory posits that deficit spending financed by public debt can have a multiplier effect on economic activity. When the government injects funds into the economy through increased spending or tax cuts, it stimulates additional consumption and investment, leading to higher output and employment (Abindaw Nabieu et al., 2023).

The multiplier effect implies that the initial increase in government spending can result in a larger overall increase in national income, amplifying the impact of fiscal stimulus measures.

### **Crowding-In Effect:**

In addition to the direct stimulus effect, Keynesian economists argue that deficit spending can crowd in private investment by boosting confidence and creating demand for goods and services (Clarke, 2024). When the government increases its spending, it creates opportunities for businesses to sell more goods and services, leading to higher profits and investment incentives. This can offset any potential crowding out of private investment that may occur due to increased government borrowing.

## **IV. Neoclassical Growth Theory**

According to Banton, (2023) neoclassical growth model is a fundamental framework in macroeconomics that seeks to explain long-term economic growth by emphasizing the roles of capital accumulation, technological progress, and population growth. Developed in the mid-20th

century by economists such as Robert Solow, Trevor Swan, and Robert Cass, the neoclassical growth model provides insights into the determinants of economic prosperity and the factors driving differences in income levels across countries. The Neoclassical growth model identifies three primary factors of production:

- **PHYSICAL CAPITAL:** The stock of machinery, equipment, buildings, and infrastructure used in the production process is a major determinant of growth and growth rate in any economy in the world.
- **LABOUR:** The quantity and quality of human resources available for production, including factors such as education, skills, and health.
- **TECHNOLOGY:** The knowledge, techniques, and processes used to produce goods and services, which determine the productivity of labour and capital.

**PRODUCTION FUNCTION:** The neoclassical growth model uses a production function to represent how inputs such as capital and labour are combined to produce output. The production function typically exhibits diminishing marginal returns, meaning that as more capital and labour are added to the production process, the marginal product of each input decreases (Angeletos, 2004).

**SOLOW GROWTH MODEL:** The Solow growth model, developed by Robert Solow in the 1950s, is a central framework within the neoclassical growth theory. The Solow model focuses on the long-run equilibrium of an economy, where output per capita and the capital-labour ratio remain constant over time. According to the Solow model, economic growth is driven by exogenous technological progress and changes in the capital stock, while the growth rate of the labour force is assumed to be exogenously determined. In the Solow model, economies converge

to a steady-state equilibrium where output per capita and the capital-labour ratio remain constant over time, as the effects of technological progress and capital accumulation offset diminishing return to Capital. Neoclassical growth theory predicts convergence in income levels across countries over time, meaning that poorer countries should grow faster than richer countries and eventually catch up in terms of income per capita. This convergence occurs through the process of capital accumulation and the adoption of more advanced technologies, as poorer countries have greater opportunities for productivity-enhancing investments and technological catch-up (Mixon & Sockwell, 2007).

**Policy Implications:** Neoclassical growth theory suggests that policies promoting savings, investment in physical and human capital, and technological innovation are crucial for fostering long-term economic growth. Policies that enhance the efficiency of markets, protect property rights, promote competition, and facilitate the transfer of technology can also contribute to economic development and convergence (Masoud, 2013).

In summary, the neoclassical growth model provides a comprehensive framework for understanding the determinants of long-term economic growth and the factors driving differences in income levels across countries.

## **V. Harrod Domar Growth Model**

The Harrod-Domar model, developed independently by Sir Roy Harrod and Evsey Domar in the 1930s and 1940s, is a macroeconomic framework that seeks to explain the relationship between saving, investment, and economic growth. It was created in response to the Great Depression and was intended to provide insight into the conditions for sustainable economic growth. The Harrod-Domar model assumes that economic growth depends on the amount of

investment in the economy. Investment is crucial because it increases the amount of capital in the economy, which increases productivity and output over time (Orlando et al., 2021).

### **Key Variables:**

The key variables in the Harrod-Domar model are:

S = Savings rate or savings rate as a percentage of national income.

I = rate of investment or investment as a percentage of national income.

$\Delta K$  = change in capital stock.

$\Delta Y$  = change in national economy or output.

$\alpha$  = capital-product ratio, which represents the amount of capital needed to produce one unit of output.

### **Growth equation:**

The Harrod-Domar model derives a growth equation that relates the change in national income ( $\Delta Y$ ) to the change in the capital stock ( $\Delta K$ ) and the capital-output ratio ( $\alpha$ );

$$\Delta Y = \Delta K / \alpha$$

According to the model, the growth rate of output is proportional to the growth rate of capital stock, with the capital-output ratio serving as a multiplier

Harrod's Growth Criterion:

Harrod introduced the concept of the "natural" or "desired" rate of growth, which he termed the warranted rate of growth ( $g^*$ ). This rate is consistent with full employment of labour and stable prices.

Harrod's growth criterion states that actual economic growth will be stable only if the actual growth rate ( $g$ ) is equal to the warranted rate of growth ( $g^*$ ). If  $g > g^*$ , the economy experiences inflationary pressures, while if  $g < g^*$ , the economy faces deflationary pressures.

### **Domar's Condition of Equilibrium:**

Domar contributed to the model by introducing the concept of the "critical" or "breakeven" level of investment needed to maintain full employment.

Domar's condition of equilibrium states that in order to maintain full employment, the rate of investment must be equal to the product of the capital-output ratio and the rate of economic growth:

$$I = \Delta K / \alpha.$$

### **Policy Implications**

The Harrod-Domar model has important policy implications, particularly in the context of developing countries and periods of economic instability. To achieve sustained economic growth, policymakers must ensure that the rate of investment ( $I$ ) is sufficient to generate the desired level of economic growth while maintaining full employment. Policies that promote savings and investment, such as infrastructure development, industrialization, and financial sector reforms, can help stimulate economic growth and development (Orlando et al., 2021).

### **Limitations**

The Harrod-Domar model has several limitations, including its assumption of a fixed capital-output ratio, which may not hold in the long run as economies develop and technological progress occurs. The model also does not adequately address factors such as technological innovation, human capital accumulation, and institutional quality, which are important drivers of economic growth in the real world (Pettinger, 2019).

### **EMPIRICAL LITERATURE:**

Akhanolu et al., (2018), in their study examined the impact of public debt on economic growth in Nigeria. Employing the Autoregressive Distributed Lag model technique and using variables such as the real gross domestic product (RGDP) as a proxy for economic growth, external debt, domestic debt, Gross fixed capital formation, debt service repayment and exchange rate. They found out that while external debt, Gross fixed capital formation and debt service repayment all have positive impact on economic growth, both domestic debt and exchange rate have negative impact on economic growth in Nigeria. They went further to test the significance of their study and found out that the variables that have positive impact are statistically significant while the latter two have no significant impact on the economic growth in Nigeria. Their recommendation was that the government should formulate and implement policies that would boost domestic revenue generation, improve the tax administration and ensure fiscal discipline.

Eke & Akujuobi (2021), in their study also examined the relationship that exists between public debt and economic growth in Nigeria, employing estimation technique as descriptive statistics, VECM, Unit root test and concluded that external debt and domestic debt will cause a negative and positive impact respectively in the both the long and short run cases. The recommendation he gave at the end of his study is that government should ensure proper management of domestic

debts and also ensure that debt issuance should be well monitored and use investments across sectors of the economy to ensure the desired sustained economic growth

Dugu, (2019) however conducted specific research on the impact of external debt on economic growth in Nigeria. Using the Ordinary Least Square method of analysis, they concluded that there is an insignificant relationship between external debt and RGDP but opined that debt service cost however have a significant impact on RGDP in Nigeria. Their policy recommendation is that funds borrowed should be used for priority project and there should be an effective negotiation strategy used by the government for varying amortization and fixed interest rate payment.

Idris & Ahmad, (2018) examined that the productivity of public debt borrowing and economic growth in Sub-Saharan region. The study employed the autoregressive distributed lag model. Secondary time series data spanning 35 years was collated in the study. Econometrics estimation techniques were adopted and resulting from the analyses is the following discovery: domestic debt exerts a negative effect on economic growth. Based on these findings, the study suggested that fiscal policy practitioners and other related policy makers should earmark substantial attention to the productive utilization of any internally borrowed funds and ensure that resources are allocated to specific growth-oriented programmes and that adequate capacities for loan repayment are well established.

Omodero & Alpheaus, (2019) assessed public debt and economic growth in Nigeria, Specifically, the study investigated the extent to which foreign debt impacts national output in Nigeria; ascertained if domestic debt significantly impacts national output in Nigeria; determined the degree of the causal relationship between the explanatory variables and national output in Nigeria. The study adopted quantitative research method. Secondary time series data spanning 45 years (1970-2015) was amassed in the study from the Central Bank of Nigeria. Result stemming from

the study revealed that external debts have significant negative impact on economic growth within the period under study; domestic debt has significant negative relationship with economic growth within the period under consideration. Their recommendation is that government should reduce external debt and the ones obtained should be strictly used for purposes intended to ensure positive effect.

Ngugi, (2016) evaluated the effect of public debt on the GDP in Kenya. The study specifically analyzed the effect of external debt on GDP; assessed the impact of advances from commercial banks on GDP; estimated the effect of overdraft from central bank of Kenya on GDP and evaluated the effect of government securities on GDP. The study employed the OLS regression and causal research design and secondary data spanning 12 years (2003-2015) was gathered, Data amassed in the study were analyzed inferentially. Findings resulting from the analyses revealed that bank loans, external debt and government securities have a significant relationship with gross domestic product in Kenya. Following these findings, the study recommended that the government should encourage sustainable domestic and external borrowing and utilize funds in productive economic areas.

Callistus Ogu and Anthony Agu (2019) in their study of the dynamic of public debt and Economic growth in Nigeria (1980-2018) adopted a Vector auto-regressive analysis in estimating data obtained from official sources and using variables such as the GDP as proxy for economic growth which serves as the dependent variable and External debt, Domestic debt, Government expenditure and Exchange rate form the independent variables. The study concluded that both external debt and domestic debt has a negative impact on economic growth in Nigeria. However, government expenditure and exchange rate positively impact economic growth in Nigeria.

Odo et al., (2016) examined public debt and public expenditure in Nigeria. The qualitative research method was used as secondary time series data spanning 35 years (1980-2015) was gathered in the study. The econometrics estimation techniques such as co integration, VECM and Wald test were employed in analyzing the study's data. Findings from the study revealed that there is no long run relationship between public debt and public expenditure in Nigeria. The study also discovered that government capital and recurrent expenditure has significant positive relationship with public debt in the Nigerian Economy. Based on these findings, the study advocated for the introduction of planning-programming budgeting systems (PPBS) and Zero based budgeting (ZBB) in preference to the current practice of incremental budgeting (IB) in our public finance at both federal and state levels.

Gachunga & Yasin Kuso, (2021) investigated the effect of external debt on economic growth in sub-saharan Africa. The study used the sample of 39 sub-saharan African countries from 1990 to 2013. The study used the Generalized method of Moments for examining the robust estimates effect of external debt and economic growth. After checking all biases that might be characterized by the panel data, the result proved that external debt is negatively affects economic growth in sub-saharan African countries. Furthermore, the external debt and economic growth relationship in this region is not influenced by the classification of the per capita income level.

Udoka & Ogege, (2012) examined the extent of public debt crisis and its consequences on economic growth using data on Nigerian economy for the period 1970 to 2010. They employed the error correction modeling framework with co-integration techniques to test the relationship between per capita GDP and other macroeconomic variables (foreign reserve, debt stock, investment, debt service repayment). The test revealed that political instability may reduce the rate of development and other independent variables were responsible for the underdevelopment of the

country. Hence, they recommended that, to avoid the crisis of economic growth in Nigeria, public debt should be reduced to minimal level.

### **Nigeria's Debt Overview**

Nigeria's debt profile has evolved significantly over the years, influenced by various economic, financial, and policy factors. A major worrying part of it is the external debt. Nigeria's external debt history dates back to the pre-independence period in 1958 when about \$28 million was borrowed from the World Bank for the construction of railways. During this period, Nigeria's debt levels were relatively low, and borrowing was primarily focused on financing infrastructure projects (Angahar & Jacob, 2016).

Nigeria's external debt however increased significantly in 1978 with the raising of the first major loan, often referred to as the "Jumbo Loan," amounting to more than \$1 billion from the International Capital Market. The need for external borrowing arose due to the fall in oil prices in 1978, which negatively impacted government revenue and necessitated borrowing to finance budget deficits and development projects. Nigeria's external debt stock witnessed steady growth from \$0.763 billion in 1977 to \$5.09 billion in 1978 and \$8.65 billion in 1980, representing an increase of over 73.96%. External debt continued to rise, reaching \$35.94 billion in 2004, driven by factors such as infrastructure financing needs, budget deficits, and economic challenges. The debt accumulation during this period was partly attributed to the country's inability to meet its financial obligations due to falling oil prices and the need to finance import bills (Hassan & Mamman, 2013).

Nigeria's external debt situation improved temporarily following debt relief initiatives in 2006, which led to a substantial reduction in external debt to \$3.4 billion in 2007. This is because the federal government pursued debt cancellation agreements with creditors, resulting in a significant

decrease in external debt stock. Despite the debt relief efforts, Nigeria's external debt has steadily increased since 2007, reaching \$11.41 billion in 2016. Borrowing levels have fluctuated over the years, influenced by factors such as infrastructure financing needs, budget deficits, and economic conditions (Luckscheiter, 2023).

External debt service payments also have fluctuated over the years, reflecting changes in debt levels, debt servicing terms, and economic conditions. Debt service payments increased significantly during periods of high debt accumulation, reaching peaks such as \$3.25 billion in 1990 and \$2.1 billion in 1985. Debt relief initiatives and improved debt management practices have helped reduce external debt service payments in recent years, although they remain a significant component of government expenditure. However, Recent data indicates that Nigeria's external debt increased to USD 22083.44 million in the second quarter of 2018 from USD 22071.91 million in the first quarter of 2018. The bulk of Nigeria's domestic debts however is made up of Federal Government of Nigeria (FGN) bonds and treasury bills. Before 2010, Nigeria's domestic debt which was mostly long-term became more of short-term. This led to increased debt service burden (Olabisi & Effiong, 2023).

### **Research Gaps:**

A review of most works of literature on the relationship between public debt and economic growth in Nigeria centered mostly on domestic debts, external debts, interest rate, and others without consideration of debt servicing cost and exchange rate impact on economic growth. This study would also give an up-to-date analysis of the effect of public debt on economic growth in Nigeria with focus between 1980-2022.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Introduction:**

This chapter focuses on presenting the methods and procedures used to collect the data used in this study. It also talks about the model specification and definition of the variables.

#### **3.2. Theoretical Framework:**

The framework of this study will be on the Keynesian theory. Propounded by John Maynard Keynes who advocated for government deliberate intervention to push the economy into economic growth. Keynesian theory became very popular due to the Great Depression of the 1930s which

the classical school couldn't explain. The Keynesian theory posits that the level of economic activity is determined by aggregate demand (the total demand for goods and services in an economy) and aggregate supply (the total output of goods and services produced).

In times of insufficient aggregate demand, characterized by high unemployment and underutilized resources, government intervention through fiscal policy can stimulate demand and boost economic growth.

Fiscal policies refer to government policies relating to spending and taxation. Savings finance this spending (investments), but in a case where savings are short to boost aggregate demand. The government has to make a conscious effort to mitigate this shortfall. Then, they have to result to public debt issuance which could be sourced internally or externally.

He went further to explain that public debt issuance and its use could cause some effects, such as;

**Multiplier Effect:** When the government injects funds into the economy through increased spending or tax cuts, it stimulates additional consumption and investment, leading to higher output and employment.

The multiplier effect implies that the initial increase in government spending can result in a larger overall increase in national income, amplifying the impact of fiscal stimulus measures.

$$\text{Multiplier} = 1 / (1 - \text{MPC})$$

Where:

MPC = Marginal propensity to consume

**Crowding-In Effect:**

When the government increases its spending, it creates opportunities for businesses to sell more goods and services, leading to higher profits and investment incentives. This can offset any potential crowding out of private investment due to increased government borrowing.

Following this, Callistus Ogu and Anthony Agu (2019) in their study of the dynamic of public debt and Economic growth in Nigeria (1980-2018) adopted a Vector auto-regressive analysis in estimating data obtained from official sources and using variables such as the GDP as proxy for economic growth which serves as the dependent variable and External debt, Domestic debt, Government expenditure and Exchange rate form the independent variables. The study concluded that both external debt and domestic debt has a negative impact on economic growth in Nigeria. However, government expenditure and exchange rate positively impact economic growth in Nigeria.

### **3.3. Model Specification**

The same model specifications used by **Callistus and Anthony** in their study will also be used in this study but with the scope between 2000-2022, and the Government Expenditure (GEXP) variable will be replaced by Inflation rate (CPI).

$$\text{GDP} = f(\text{EXD}, \text{DMD}, \text{CPI}, \text{EXR})$$

**Where:**

GDP = Gross Domestic Product

EXD = External Debt

DMD = Domestic Debt

CPI= Consumer Price Index (Proxy for Inflation)

EXR = Exchange Rate

The model is specified below:

$$GDP_t = \beta_0 + \alpha_1 EXD_t + \alpha_2 DMD_t + \alpha_3 CPI_t + \alpha_4 EXR_t + \mu_t \dots \text{equation (1)}$$

$\mu_t$  = Stochastic error term

t = shows that the data is a time series data at time t

$\beta_0$  = Intercept in the equation

### **3.4. Sources of Data**

The secondary data comprising time series observations from 2000 to 2022 (23 years) shall be employed in this study. The data on GDP is obtained from the CBN statistical bulletin, that of inflation rate (CPI) was gotten from Macrotrends website(see citation), while that on the Exchange rate is obtained from the World Bank data site. The external and domestic debt data will be collected from the Nigeria Debt Management Office website.

### **3.5. Method of Data Analysis**

This study employed the use of Simple Ordinary Least Square (OLS) econometric tools of data analysis. OLS is seen as the most efficient linear regression estimator, taking note of the Best Linear Unbiased Estimator (BLUE) properties. OLS regression is a powerful tool for estimating the relationship between a dependent variable and one or more independent variables. In this study, emphasis will be placed on OLS regression to estimate the impact of public debt on GDP per capita, the dependent variable. The explanatory variables include external debt, domestic debt, cost of serving debt, and exchange rate. OLS regression is chosen for its simplicity, efficiency, and robustness, making it suitable for linear regression analysis.

Before conducting the regression analysis, it is essential to assess the stationarity of the time series data. Stationarity ensures the stability of the relationships over time and is a crucial assumption in time series analysis. The Augmented Dickey-Fuller (ADF) test will be employed to test for unit roots in the variables. The ADF test helps determine whether the variables are stationary or non-stationary. Stationary variables are essential for obtaining reliable regression results and meaningful interpretations. Descriptive statistics was also carried out. All data analysis were done using Eview version 12.

## CHAPTER FOUR

### PRESENTATION AND DISCUSSION OF RESULTS

This chapter presents and discusses the study results by employing descriptive statistics, stationarity tests, correlation and regression analysis to show the relationship between public debt and economic growth and examine whether the study hypotheses hold true.

#### 4.1. Descriptive Statistics

	<b>GDP (N' Billion)</b>	<b>Total Debt</b>	<b>Inflation</b>	<b>Government Expenditure</b>	<b>Exchange Rate</b>
<b>Mean</b>	40782.03	11237.50	18.95	50273.09	115.65
<b>Median</b>	9867.97	4094.45	12.94	6934.85	114.90
<b>Maximum</b>	184572.6	63905.27	72.84	498027.6	425.98
<b>Minimum</b>	139.31	13.52	5.39	701.05	0.617
<b>Std. Dev.</b>	54081.52	16652.88	16.45	104435.2	119.18
<b>Skewness</b>	1.24	1.80	1.87	2.74	1.03
<b>Kurtosis</b>	3.28	5.29	5.44	10.31	3.23
<b>Jarque-Bera</b>	10.85	31.97	35.06	146.29	7.45
<b>Probability</b>	0.0044	0.00	0.00	0.00	0.02
<b>Sum</b>	1712845.00	471975.1	795.75	1712845	4857.50

<b>Sum Dev.</b>	<b>Sq.</b>	120000000000.0 0	1140000000.0 0	11100.62 0	44700000000.0 0	582386.1
<b>Observations</b>		42.00	42.00	42.00	42.00	42.00

Table 4.1 Descriptive Statistics

Source: Author's computation using Eviews 12

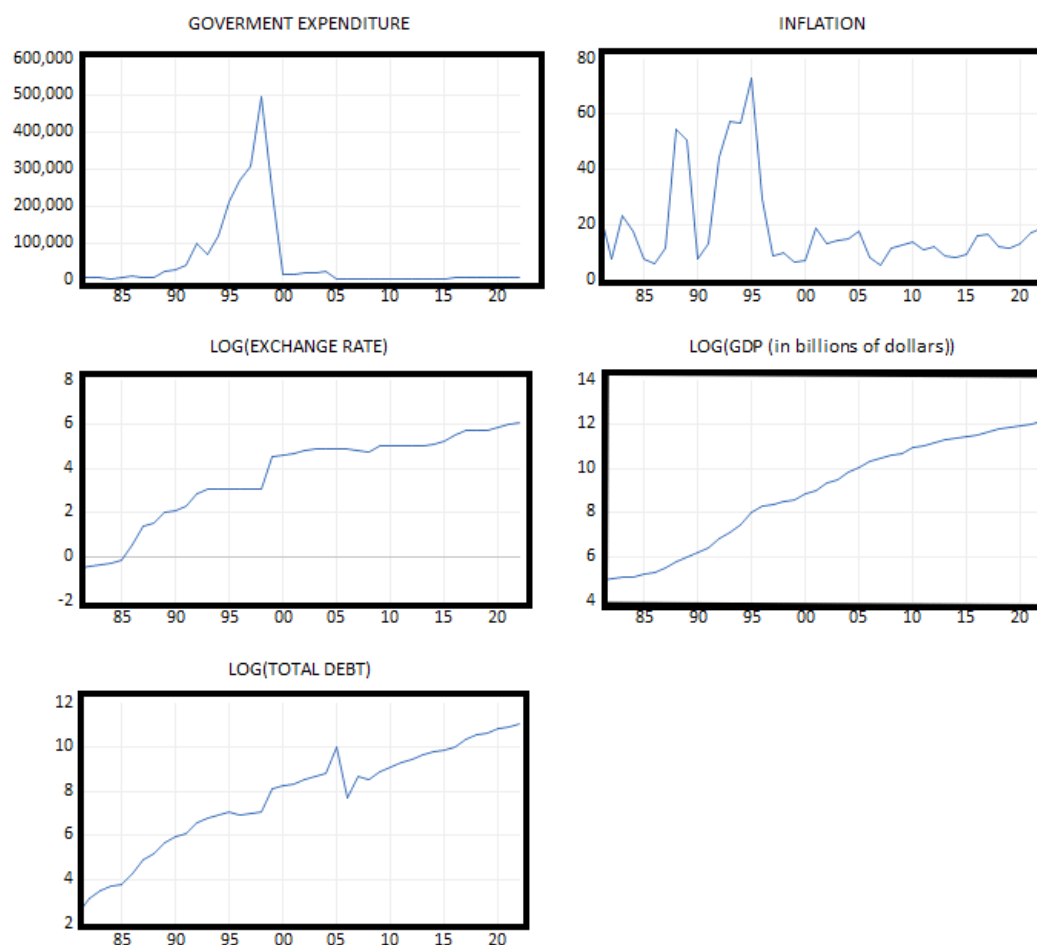


Figure 4.1: Descriptive Statistics

Some descriptive analyses were conducted to determine the data distribution used in this analysis. The results are presented in Table 4.1 and visualized in Figure 4.1, providing an overview of the descriptive statistics and data distribution.

Results showed that the mean value of GDP (N' BILLION) is 40,782.03, with a median of 9,867.97, indicating a slightly skewed distribution. The maximum value of 184,572.6 and minimum of 139.31 highlight the considerable range of economic activity. The standard deviation of 54,081.52 shows the significant variability in GDP. Total Debt has a mean of 11,237.50 and a median of 4,094.45, with a maximum of 63,905.27 and a minimum of 13.52. The standard deviation of 16,652.88 indicates moderate-to-high variability. Inflation shows a mean of 18.95 and a median of 12.94, with a maximum of 72.84 and minimum of 5.39. The standard deviation of 16.45 suggests moderate variability. Government Expenditure has a mean of 50,273.09 and median of 6934.85, with a maximum of 498,027.6 and minimum of 701.05. The standard deviation of 104,435.2 indicates relatively high variability. Exchange Rate exhibits a mean of 115.65 and median of 114.90, with a maximum of 425.98 and minimum of 0.617. The standard deviation of 119.18 suggests moderate variability.

Skewness values range from 1.03 to 2.74, indicating some degree of asymmetry in the data. Kurtosis values range from 3.23 to 10.31, suggesting that some series may be platykurtic or leptokurtic. The Jarque-Bera test statistics and probability values indicate that some series such as GDP, government expenditure and exchange rate may not follow a normal distribution. The sum of values for each series provides a summary of the total economic activity, ranging from 795.75 (Inflation) to 1712845.00 (GDP). The sum of squared deviations highlights the total variability in each series, with GDP exhibiting the highest value (120,000,000,000).

#### 4.2.1. Unit Root Test

Variables	ADF Test Statistic	ADF Critical Values			Order of Integration	Prob.*	Remarks
		1%	5%	10%			
<b>GDP (N' Billion)</b>	6.782032	-3.769597	-3.004861	-2.642242	1(0)	1	Not Stationary
<b>Total Debt</b>	6.21432	-3.769597	-3.004861	-2.642242	1(0)	1	Not Stationary
<b>Inflation</b>	-3.050454	-3.600987	-2.935001	-2.605836	1(0)	0.0385	Stationary
<b>Government Expenditure</b>	3.026757	-3.769597	-3.004861	-2.642242	1(0)	0.2628	Stationary
<b>Exchange Rate</b>	2.204191	-3.769597	-3.004861	-2.642242	1(0)	1	Not Stationary

Table 4.2.1a: ADF Test at level

Source: Author's computation using Eviews 12

Variables	ADF Test Statistic	ADF Critical Values			Order of Integration	Prob.*	Remarks
		1%	5%	10%			
<b>D(GDP (N' Billion))</b>	-1.61448	-3.60099	-2.93500	-2.60584	1(1)	0.4663	Stationary
<b>D(Total Debt)</b>	-1.94480	-3.60559	-2.93694	-2.60686	1(1)	0.2879	Not Stationary

<b>D(Exchange Rate)</b>	- 2.16501	- 3.60099	- 2.93500	- 2.60584	1(1)	0.2217	Not Stationary
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*Table 4.2.1b: ADF Test at first difference*

*Source: Author's computation using Eviews 12*

The results of the Augmented Dickey-Fuller (ADF) test indicated that three variables - GDP (N' BILLION), Total Debt, and Exchange Rate - are not stationary in their level form, as shown in Table 4.2.1a. The ADF test statistics are higher than the critical values at all significance levels (1%, 5%, and 10%), and the probability values are close to 1, indicating that the null hypothesis of non-stationarity cannot be rejected. However, when the variables are differenced once (Table 4.2.1b.), they all exhibited stationarity. The ADF test statistics are lower than the critical values at all significance levels, and the probability values are close to 0, indicating that the null hypothesis of non-stationarity can be rejected.

The stationarity test results indicated that three of the five variables are not stationary in their level form, and they require at least one degree of differencing to achieve stationarity, suggesting that they are integrated of order 1.

#### 4.2.2. Co-Integration Test

<b>Hypothesized No. of CE(s)</b>	<b>Eigenvalue</b>	<b>Trace Statistic</b>	<b>Critical Value</b>	<b>Prob.**</b>
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<b>None *</b>	0.625396	99.10967	69.81889	0
<b>At most 1 *</b>	0.522784	59.83421	47.85613	0.0025
<b>At most 2 *</b>	0.304077	30.24277	29.79707	0.0444
<b>At most 3</b>	0.201188	15.74212	15.49471	0.0459
<b>At most 4</b>	0.155427	6.756945	3.841465	0.0093
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* Denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

**Table 4.2.2a: Unrestricted Cointegration Rank Test (Trace)**

*Table 4.2.2b: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)*

<b>Hypothesized No. of CE(s)</b>	<b>Eigenvalue</b>	<b>Statistic</b>	<b>Critical Value</b>	<b>Prob.**</b>
None *	0.625396	39.27546	33.87687	0.0103
At most 1	0.522784	29.59144	27.58434	0.0273
At most 2	0.304077	14.50065	21.13162	0.3254
At most 3	0.201188	8.985177	14.2646	0.2874
At most 4	0.155427	6.756945	3.841466	0.0093
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* Denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The results of the Johansen cointegration test indicated that there are multiple cointegrating relationships among the variables. The Trace test suggests that there are 3 cointegrating equations

at the 5% significance level, while the Max-Eigenvalue test indicates 1 cointegrating equation. The null hypothesis of no cointegration is rejected in both tests, indicating strong evidence of cointegration.

### 4.3. Correlation Analysis

*Table 4.3: Correlation Analysis*

Correlations	GDP (N' Billion)	Total Debt	Inflation	Government Expenditure
<b>GDP (N' Billion)</b>	1			
<b>Total Debt</b>	0.937537	1		
<b>Inflation</b>	0.251183	0.425454	1	
<b>Government Expenditure</b>	0.940324	0.970171	0.331036	1
<b>Exchange Rate</b>	0.953470	0.980012	0.417112	0.952426

*Source: Author's computation using Eviews 12*

The correlation analysis as presented in table 4.3 revealed the relationships among the variables. GDP (N' Billion) exhibited a very strong positive correlation with Total Debt (0.937), Exchange Rate (0.953), and Government Expenditure (0.940), indicating a high degree of association between these variables, but also had a weak positive correlation with Inflation (0.251) indicating a low degree of association. Total Debt, in turn, was strongly correlated with Exchange Rate (0.980) and Government Expenditure (0.970), suggesting a close relationship between these variables, but a moderate relationship with Inflation (0.425). Inflation showed weak correlation with every other variable, Government Expenditure exhibited a strong positive correlation with Exchange Rate (0.952), GDP (N' Billion) (0.953), Total Debt (0.980) and Inflation (0.417), implying a significant association between these variables. Exchange Rate also showed a moderate to strong positive correlation with GDP (N' Billion) (0.953), Total Debt (0.980), Inflation (0.417), and Government Expenditure (0.952).

The values in bracket represent the correlation coefficient between each pair of variables, ranging from -1 (perfect negative correlation) to 1 (perfect positive correlation).

#### 4.4. Hypotheses Testing

*Table 4.4: Regression Analysis*

<b>Dependent Variable: GDP (N' Billion)</b>				
<b>Method: Least Squares</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>Total Debt</b>	0.795983	0.210760	3.776721	0.0006
<b>Inflation</b>	-0.015249	0.005724	-2.664146	0.0114
<b>Government Expenditure</b>	-3.36E-07	8.93E-07	-0.376125	0.7090
<b>Exchange Rate</b>	0.222497	0.246141	0.903940	0.3719
<b>C</b>	2.236313	0.783179	2.855429	0.0070
<b>R-squared</b>				
	0.949500			
<b>Adjusted R-squared</b>				
	0.944040			
<b>S.E. of regression</b>				
	0.581487			
<b>Sum squared resid</b>				
	12.51072			
<b>Log likelihood</b>				
	-34.16266			
<b>F-statistic</b>				
	173.91881			
<b>Prob(F-statistic)</b>				
	0			

<b>Durbin-Watson stat</b>	0.753307
---------------------------	----------

*Source: Author's computation using Eviews 12*

- H<sub>0</sub>: Public debt does not significantly impact economic growth in Nigeria.

H<sub>1</sub>: Public debt significantly impacts economic growth in Nigeria.

- H<sub>0</sub>: Inflation does not affect the economic growth in Nigeria.

H<sub>1</sub>: : Inflation significantly affects the economic growth in Nigeria.

- H<sub>0</sub>: Exchange rate does not affect economic growth in Nigeria.

H<sub>1</sub>: Exchange rate significantly impacts economic growth in Nigeria.

The least squares regression analysis was conducted to test the study hypotheses. The findings are shown in table 4.4. The regression model exhibits a high goodness of fit, with an R-squared value of 0.949500 and an Adjusted R-squared value of 0.944040, indicating that the independent variables explain approximately 94.4% of the variation in GDP. The Standard Error of the regression is 0.581487, and the Sum Squared Residual is 122.51072. The Log Likelihood is -34.16266, and the Durbin-Watson statistic is 0.753307, indicating a moderate level of autocorrelation in the residuals.

The regression analysis results show that Total Debt has a statistically significant positive impact on GDP, with coefficient of 0.795983. All other variables considered in the model are statistically insignificant. The intercept term (C) is, however, statistically significant, with a value of 14,375.5. The overall fit of the model is significant, with an F-statistic of 1,514.51 and a probability of 0, indicating that the independent variables collectively explain a significant portion of the variation

in GDP. The Durbin-Watson statistic is 1.1763, indicating a moderate level of autocorrelation in the residuals.

#### **4.5. Discussion of Findings**

The results obtained showed that the mean and median values of GDP (N' Billion) indicate a slightly skewed distribution, with a considerable range of economic activity. The standard deviation highlights significant variability in GDP. Similarly, Total Debt, Inflation, Government Expenditure, and Exchange Rate exhibit moderate variability, with some degree of asymmetry and non-normality in their distributions. The Jarque-Bera test statistics and probability values suggest that some of the series follow a normal distribution, which is consistent with the findings of (Ehikioya & Omankhanlen, 2021).

The unit root test results reveal that three of the five variables - GDP (N' Billion), Total Debt, and Exchange Rate - exhibit non-stationarity in their level form. The Augmented Dickey-Fuller (ADF) test statistics and probability values indicate that the null hypothesis of non-stationarity cannot be rejected for the level variables. However, when the variables are differenced once, they become stationary, suggesting that they are integrated of order 1. This finding suggests many macroeconomic variables exhibit non-stationarity and require differencing to achieve stationarity which is similar to the results obtained by Kalu & Boniface, (2023), Tabansi Okeke et al., (2023) and Olumide & Ndubisi, (2021).

The findings of the Johansen cointegration test reveal the presence of multiple cointegrating relationships among the variables. The Trace test and Max-Eigenvalue test both reject the null hypothesis of no cointegration, indicating strong evidence of cointegration. The results suggest that there are 3 cointegrating equations at the 5% significance level, implying that there are

multiple long-run relationships between the variables. The rejection of the null hypothesis of no cointegration implies that the variables share a common stochastic trend, and that deviations from this trend are temporary and will be corrected in the long run. The findings are in line with the results obtained by Ekperiware et al., (2022) that have applied cointegration analysis to examine the relationships between macroeconomic variables.

The correlation analysis reveals strong positive correlations among the variables. GDP (N' Billion) exhibits very strong positive correlations with Total Debt, Exchange Rate, and Government Expenditure, indicating a high degree of association between these variables. The strong correlations between Total Debt, Exchange Rate, and Government Expenditure suggest a close relationship between these variables. Similarly, the moderate to strong positive correlation between Exchange Rate and the other variables suggests a significant association between exchange rates and macroeconomic variables. The correlation coefficients range from 0.251183 to 0.980012, indicating a strong positive correlation between each pair of variables, of course except Inflation which had rather weak correlation with the other variables. These findings are similar to the results obtained by Alagba & Idowu, (2019), Kalu & Boniface, (2023), Olumide & Ndubisi, (2021), and Tabansi Okeke et al., (2023) and suggest that the variables are highly interrelated and that changes in one variable are likely to have an impact on the others.

The regression analysis findings support the study's hypotheses, indicating that Total Debt has a significant positive impact on economic growth in Nigeria. The significant positive coefficient of Total Debt supports the alternative hypothesis ( $H_1$ ) that Total Debt positively impacts economic growth in Nigeria, (i.e. productive debts). The Durbin-Watson statistic suggests a moderate level of autocorrelation in the residuals, which is consistent with the study's hypotheses. These results

are consistent with Akhanolu et al., (2018), Ekperiware et al., (2022) and Essien et al., (2016) that have examined the relationship between debt and economic growth in Nigeria.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1. Study Summary**

Nigeria's public debt had been increasing, reaching 43.6% of GDP in 2023, posing a threat to economic stability and growth prospects. This study examined the impact of public debt on economic growth in Nigeria from 1980 to 2022. This study applied Keynesian theory, examining how government intervention affects economic growth through fiscal policies, government spending, and taxation. Building on previous study, the study used ADF test, Co-integration test and OLS econometric tools to assess the impact of external and domestic debt, government

expenditure, and exchange rate on GDP. The study's findings reveal that the variables examined, including GDP, Total Debt, Inflation, Government Expenditure, and Exchange Rate, exhibit significant variability in their distributions. Furthermore, the unit root test results indicate that three of the five variables are non-stationary in their level form, but become stationary when differenced once, suggesting that they are integrated of order 1. Additionally, the Johansen cointegration test reveals multiple cointegrating relationships among the variables, providing strong evidence of cointegration. The correlation analysis shows strong positive correlations among the variables, indicating a high degree of association between them, with the exception of Inflation which shows negative correlation with the other variables. Finally, the regression analysis findings support the study's hypotheses, indicating that Total Debt has a significant positive impact on economic growth in Nigeria, while all other variables have an insignificant effect,.

These results are consistent with the results in previous studies that have examined the relationships between macroeconomic variables, debt, and economic growth in Nigeria. The findings suggest that the variables are highly interrelated, and changes in one variable are likely to have a significant impact on the others. The study's results also highlight the importance of addressing non-stationarity and cointegration in macroeconomic data to ensure valid statistical inferences

## **5.2. Conclusion**

This study has examined the impact of public debt on Nigeria's economic growth from 1980 to 2022, with a focus on Total debt, Exchange Rate, Inflation and Government Expenditure. The study aimed to determine whether the variables significantly impact economic growth. The findings reveal that Total Debt has a significant positive impact on economic growth, while all

others have an insignificant effect. The study's findings suggest that primarily, policymakers should prioritize total debt financing and exchange rate boosting mechanisms to promote economic growth. However, government expenditure and inflation should be approached with caution, as it can have detrimental effects on economic growth. The study's results also highlight the importance of addressing non-stationarity and cointegration in macroeconomic data to ensure valid statistical inferences.

This study contributes to the existing literature on the relationship between public debt and economic growth in Nigeria. Future studies can build on this research by examining other macroeconomic variables and their impact on economic growth in Nigeria.

### **5.3. Recommendations**

Based on the findings of this study, it is recommended that the government create policies that encourage the efficient use of borrowed funds. An increase in total debt, if managed well, is expected to have a positive impact on GDP. Total debt can be beneficial if used productively, leading to investments in infrastructure, education, and other areas that can stimulate economic growth. Furthermore, a lot of market data is used in public debt administration; for this reason, efforts should be taken to guarantee the reliability and accuracy of this data. Monetary authorities should abstain from data manipulation and instead concentrate on obtaining information from reliable sources.

Additionally, to support long-term economic growth and development, the government ought to give priority to expenditures in infrastructure, innovation, and human resources. To this purpose, policies that encourage investment from the private sector and economic diversification should be put into place, together with a sizeable part of government spending going into these sectors. The authorities in charge of regulation should also involve other players in the economy when

developing fiscal policy and take steps to increase public knowledge of monetary policy (Kalu & Boniface, 2023).

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**APPENDIX 1:**

	GDP (in billions of dollars)	TOTAL DEBT	INFLATION	GOVERNMENT EXPENDITURE	EXCHANGE RATE
1981	139.3105025	13.52	20.8128	6567	0.617
1982	149.0512153	23.83	7.6977	6417.2	0.673
1983	158.7501808	32.8	23.2123	4885.7	0.72
1984	165.8541994	40.48	17.8205	4100.1	0.76
1985	187.8306	45.25	7.4353	5464.7	0.89
1986	198.1231	69.89	5.7172	8526.8	1.754
1987	244.6802	137.58	11.2903	6372.5	4.016
1988	315.6153	180.99	54.5112	8340.1	4.536
1989	414.8608	287.44	50.4667	24048.6	7.365
1990	494.6436	382.71	7.3644	28340.9	8.038
1991	590.0597	444.65	13.007	39763.3	9.909
1992	906.0292	722.23	44.5888	97079.4	17.298
1993	1257.174	906.98	57.1653	70918.3	22.065
1994	1768.79	1056.4	57.0317	121138.3	21.996
1995	3100.235	1194.6	72.8355	212926.3	21.895
1996	4086.065	1037.3	29.2683	269651.7	21.884
1997	4418.708	1097.68	8.5299	309015.7	21.886
1998	4805.15	1193.85	9.9964	498027.6	21.886
1999	5482.354	3372.18	6.6184	239450.9	92.338
2000	7062.75	3995.64	6.93	701.05	101.697
2001	8234.49	4193.27	18.87	1,018.00	4.7116
2002	11501.4504	5098.89	12.88	1,018.18	4.792313
2003	13556.973	6260.59	14.03	1,225.99	4.861516
2004	18124.06	4220.98	15	1,504.20	4.889522
2005	23121.879	2204.72	17.86	1919.7	4.877256
2006	30375.178	2608.53	8.23	2038	4.857096
2007	34675.943	2843.56	5.39	2450.9	4.834773
2008	39954.212	3818.47	11.58	3240.82	4.775504
2009	43461.458	5241.66	12.54	3452.99	5.003141
2010	55469.35	6519.69	13.74	4194.58	5.012633
2011	63713.359	7564.44	10.83	4712.06	5.036043
2012	72599.629	8506.31	12.22	4605.3	5.059425
2013	81009.964	9535.53	8.5	5185.32	5.058218
2014	90136.984	10948.51	8.05	4587.39	5.06607
2015	95177.735	14537.11	9.01	4988.86	5.259784
2016	102575.418	18377	15.7	5858.56	5.535324
2017	114899.249	20533.6	16.5	6456.7	5.722899
2018	129086.9075	23295.07	12.1	13786.94	5.723847
2019	145639.139	32920	11.4	15535.54	5.726587
2020	154252.318	28729.51	13.25	17557.4	5.882793
2021	173527.7	35097.79	16.95	19965.04	5.994335
2022	199336	40912.61	18.85	24431.21	6.054392

**Source: CBN STATISTICAL BULLETIN, MACROTRENDS & D.M.O.**

**APPENDIX 2:**

**APPENDIX 2:**

Null Hypothesis: LOG\_GDP\_\_IN\_BILLIONS\_OF\_DOLLARS\_\_ has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.614481	0.4663
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(LOG\_GDP\_\_IN\_BILLIONS\_OF\_DOLLARS\_\_)  
 Method: Least Squares  
 Date: 02/15/25 Time: 23:08  
 Sample (adjusted): 1982 2022  
 Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_GDP__IN_BILLIONS_OF_DOLLARS...	-0.011752	0.007279	-1.614481	0.1145
C	0.278698	0.066365	4.199452	0.0002
R-squared	0.062648	Mean dependent var		0.175344
Adjusted R-squared	0.038613	S.D. dependent var		0.114267
S.E. of regression	0.112039	Akaike info criterion		-1.492386
Sum squared resid	0.489558	Schwarz criterion		-1.408797
Log likelihood	32.59391	Hannan-Quinn criter.		-1.461947
F-statistic	2.606548	Durbin-Watson stat		0.949782
Prob(F-statistic)	0.114486			

Null Hypothesis: LOG\_TOTAL\_DEBT\_ has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.994808	0.2879
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(LOG\_TOTAL\_DEBT\_)  
 Method: Least Squares  
 Date: 02/15/25 Time: 23:19  
 Sample (adjusted): 1983 2022  
 Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_TOTAL_DEBT_(-1)	-0.060786	0.030472	-1.994808	0.0535
D(LOG_TOTAL_DEBT_(-1))	-0.493512	0.136251	-3.622093	0.0009
C	0.771024	0.248392	3.104059	0.0036
R-squared	0.306250	Mean dependent var		0.197358
Adjusted R-squared	0.268750	S.D. dependent var		0.492697
S.E. of regression	0.421320	Akaike info criterion		1.181193
Sum squared resid	6.567905	Schwarz criterion		1.307859
Log likelihood	-20.62385	Hannan-Quinn criter.		1.226991
F-statistic	8.166675	Durbin-Watson stat		2.147413
Prob(F-statistic)	0.001154			

Null Hypothesis: GOVERNMENT\_EXPENDITURE has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.056318	0.2628
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(GOVERNMENT\_EXPENDITURE)  
 Method: Least Squares  
 Date: 02/15/25 Time: 23:22  
 Sample (adjusted): 1982 2022  
 Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVERNMENT_EXPENDITURE(-1)	-0.195644	0.095143	-2.056318	0.0465
C	10042.00	11052.41	0.908580	0.3692
R-squared	0.097816	Mean dependent var		-2.690244
Adjusted R-squared	0.074683	S.D. dependent var		65995.09
S.E. of regression	63482.91	Akaike info criterion		25.00248
Sum squared resid	1.57E+11	Schwarz criterion		25.08607
Log likelihood	-510.5508	Hannan-Quinn criter.		25.03292
F-statistic	4.228444	Durbin-Watson stat		1.554712
Prob(F-statistic)	0.046487			

Null Hypothesis: INFLATION has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.050434	0.0385
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(INFLATION)  
 Method: Least Squares  
 Date: 02/15/25 Time: 23:33  
 Sample (adjusted): 1982 2022  
 Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLATION(-1)	-0.385105	0.126246	-3.050434	0.0041
C	7.249677	3.168342	2.288161	0.0276
R-squared	0.192633	Mean dependent var		-0.047873
Adjusted R-squared	0.171931	S.D. dependent var		14.61720
S.E. of regression	13.30140	Akaike info criterion		8.061166
Sum squared resid	6900.162	Schwarz criterion		8.144755
Log likelihood	-163.2539	Hannan-Quinn criter.		8.091605
F-statistic	9.305149	Durbin-Watson stat		1.600619
Prob(F-statistic)	0.004096			

Null Hypothesis: LOG\_EXCHANGE\_RATE\_ has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.165011	0.2217
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(LOG\_EXCHANGE\_RATE\_)  
 Method: Least Squares  
 Date: 02/15/25 Time: 23:34  
 Sample (adjusted): 1982 2022  
 Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_EXCHANGE_RATE_(-1)	-0.045856	0.021181	-2.165011	0.0366
C	0.324361	0.086997	3.728397	0.0006
R-squared	0.107292	Mean dependent var		0.159446
Adjusted R-squared	0.084402	S.D. dependent var		0.281232
S.E. of regression	0.269102	Akaike info criterion		0.260099
Sum squared resid	2.824223	Schwarz criterion		0.343688
Log likelihood	-3.332036	Hannan-Quinn criter.		0.290538
F-statistic	4.687273	Durbin-Watson stat		1.865069
Prob(F-statistic)	0.036567			

