Original Research Article

EFFECT OF PUBLIC DEBT ON ECONOMIC DEVELOPMENT IN NIGERIA (2000 – 2023)

Abstract

The study examined the effect of public debt on economic development in Nigeria spanning from 2000 to 2023 with emphasis on the effect of domestic debt (DDEBT), bilateral debt (BDEBT), multilateral debt (MDEBT) and debt servicing (DEBSERV). The research adopted *ex-post facto* research design. Secondary data were collected from Debt Management Office (DMO), Central Bank of Nigeria Statistical Bulletin, United Nations Development Programme (UNDP) and National Bureau of Statistics (NBS). The econometric technique of multiple regression analysis, Augmented Dickey Fuller (ADF), Unit Root Test, Johansen Co-integration Test and Error Correction Model (ECM) were employed in the data analysis. The co-integration test showed that long-run equilibrium relationship exists among the variables. The findings from the data analysis showed that domestic debt has negative and insignificant effect on economic development in Nigeria. Bilateral debt has positive and non-significant effect on economic development in Nigeria. Multilateral debt has negative and non-significant effect on economic development in Nigeria while debt servicing has a positive and non-significant effect on economic development in Nigeria. The implication of the findings is that proper and judicious use of public debt affects positively on economic development in Nigeria. Based on the findings, the study therefore recommends that government should reduce the level of domestic debt accumulation. Government should acquire more bilateral loans that should be channeled into viable projects with high return on investment. Government should avoid acquiring multilateral loans because of their negative effect on the development of Nigerian economy. Debt servicing requirement should not be allowed to increase above the debt stock by regularly servicing the loan.

Keywords: Public Debt, Economic Development, Domestic Debt, Bilateral Debt, Multilateral Debt and Debt Servicing

1.0 Introduction

Public debt is the amount of money owed by different levels of government to its creditors, including individuals, corporations, and other governments. Debt can be acquired within the same country or abroad and usually takes the form of bonds, paper and government securities. Nwoye, Udunwoke and Nworie [1] and Ikwuo, Josiah, Abagha, Egwu, Nkwagu [2] The need to finance critical infrastructure and various development projects in the face of limited resources emanating from low savings, is the major reason nations borrow. Debt usually arises when a government spend more than it collected in revenue. Governments issue bonds, bills

and notes to finance their budget deficit, and the investors who buy these securities becomes the holder of the government debt. Thus, the importance of public debt cannot be overemphasized. Debt itself is not necessarily bad, however, increasing debt level can reduce per capital income and make society collectively poorer and economically unviable [1]. Government debt plays a crucial role in financing public goods and services, responding to unexpected events, and macroeconomic stabilization by allowing government to manage the money supply, interest rate and inflation. Nigeria is facing economic challenges due to its high level of government debt, which has led to a stunted development growth rate, slowing export growth rate, reduce income per capital, and increasing poverty levels.

Nigeria capital stock is low, as is the case in most developing countries, due to lack of domestic savings and investment [3]. Public debt is an important metric for bridging the government funding deficits. It signifies percentage of government expenditure funded by borrowing as an alternative to taxes. Nigeria Government debt accounted for 37.2% of the country's Nominal GDP in September 2023, compared with the ratio of 38.4% in the previous quarter. Nigeria debt-to-GDP was 35.2% as of September 2022. The data reached an all-time high of 38.4% in June 2023 and a record low of 9.6% in December 2010. From the above analysis, it is obvious that Nigeria domestic debt has increased while external (bilateral and multilateral) debt has dropped due to a decline in World Bank and International Monetary Fund (IMF) loans. The rising government debt is caused by increasing budget deficit, which are funded by domestic and foreign sources as well as privatization proceeds. In quarter 3 of 2022, Nigeria's debt service costs surged by 28% of N1.7 trillion, indicating that the country spent N1.7 trillion on domestic and external debt service, a 27.9% increase compared to N912.7 billion during quarter 3 of 2021. Despite Nigeria's debt relief measures, concern have been raised about the sustainability of its debt considering the high cost of debt servicing and the government pledge to offset accumulated arrears [4]. The impact of public debt on economic development remains a contentious issue even with previous debt relief programs such as Paris Club Debt relief of 2005.

Nigeria has received debt relief of approximately $6 billion through the Multilateral Debt Relief Initiative (MDRI) program, bought back $1.2 billion of its external debt through London Club Debt Buyback in 2013, and converted domestic debt into long-term debt bonds with lower interest rate through the Debt Management Office (DMO, 2020). In Nigeria, high level of government debt have contributed to persistent inflation, which has eroded the purchasing power of the country's citizens. Government debt also impact debt servicing, which is the cost of borrowing money. Government debt contributes to high interest rate, which have made borrowing more expensive. High level of Nigeria government debt has contributed to a depreciation in the value the country's currency, which has led to higher import prices and input price inflation [5].Thus, the relationship between government debt and economic developments is complex. On the other hand, government debt provides the necessary funding for public goods and services, such as infrastructure, education and healthcare, which Ikwuo, Awa, Nkwagu and Nkwagu [6] can promote economic development.

Various states contribute immensely to the national debt stock. Nigeria's total public debt stock rose from N39.56 trillion in December, 2021 to N41.60 trillion, $100.07 billion in the first three months of 2022 January to March [7]. Both bilateral and multilateral debts are component of external debt. The total public debt stock included new domestic borrowing by the Federal Government of Nigeria to partly finance the deficit in the 2022 Appropriation Act, the $1.25 billion Eurobond issued in March 2022 and disbursements by multilateral and bilateral lenders [5]. Nigeria's debt is divided majorly into external and domestic debt. The external debt is in four major categories; bilateral, multilateral, commercial and promissory note, others are Paris

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Club of creditors and London Club of creditors. External debt has various type and they include; public and publicly guaranteed debt, Non-guaranteed private sector external debt, and loans from international financial institutions. The bilateral represent money borrowed from other countries or governments while the multilateral is the external debt burden to international financial institutions (IFIs) such as International Monetary Fund (IMF) and the World Bank. Nigeria bilateral debt as at December, 2022 stood at $5.16bn while multilateral debt stood at $15.77bn [5]. Debt Management Office (DMO) stated that Niger's debt service increased by 14.68 per cent to N3.36 trillion in 2022 as against N2.93 trillion spent in the previous year. Domestic debt comprises Development stock, Treasury bills, Treasury certificates and Treasury bond.

Debt servicing is an integral part of public debt. To service debt, the interest and principal on loans and bonds must be paid on time. According to data obtained from the Debt Management office, between January and March 2023, Nigeria spent N874.13bn on domestic debt servicing, while it spent N617.35bn on external debt servicing, giving a total of N1.24tn. Mathew and Adetayo [8] carried out a study on the impact of public debt on economic development in Nigeria. The researcher decomposed his variables as domestic debt, external debt, domestic servicing, external debt servicing. The result showed that external debt stock and external debt servicing have insignificant negative relationship with economic development in Nigeria, however, domestic debt has direct and significant relationship with economic development while domestic service payment was significant but inversely related to economic development in Nigeria. According to Bal and Rath [9] who examined the effect of public debt on economic growth in India, in the short run, domestic debt and external debt exacerbated economic growth, while in the long run, debt service payment was positively associated with economic growth.

Economic development is a sustained increase in prosperity and quality of life realized through innovation, lowered transaction cost, and the utilization of capabilities towards the responsible production and diffusion of goods and services [10]. It is programs, policies or activities that seek to improve the economic wellbeing and quality of life for a community. Measuring economic development is a varied and difficult task. Development in countries can be measured in several different ways. Some are economic measures, and others are social measures. There are several measures of economic development such as gross national product/gross national income, per capital income, incidence of poverty and standard of living, but among all these parameters, human development index (HDI) stands out as the best measuring parameter. HDI is a statistical tool used to measure a country's overall achievement in its social and economic dimensions [11]. HDI is calculated by the United Nations by measuring average life expectancy, level of education and income for each country in the world. HDI is the best measure of development as it takes into account both economic and social factors. Other measuring parameters either takes into account the economic or social factors. HDI measures the countries overall development according to its social (standard of living) and economical (health facility and education) dimensions.

1.2 Statement of the Problem

Excessive domestic borrowing by the Nigerian government has crowded out private sector investment as the government competes with the private sector for available funds. Excessive borrowing by the Nigerian government has brought about high interest rate and inflation which affect economic development most especially in the long run [1]. In a bid to attain higher development, Nigerian government has borrowed heavily from both domestic, bilateral and multilateral sources but reverse has been the case due to high debt service and general poverty. Nigeria's debt has more than doubled from N12 trillion in 2015 to N87.91 trillion (US$114.35 billion) in 2023, yet Nigeria remains the world headquarters for extreme poverty.

Actually, most borrowing was done with the hope that there would be a turnaround in the international oil market perhaps in no distant future. It was equally, hoped that the borrowed fund would be a turnaround in the development of the Nigerian economy, however, the expected turnarounds did not come to fruition. The increase in bilateral and multilateral debt have exposed the country to high debt burden with its dire consequences. The servicing of the debt has made a frightening inroad on resources available for economic development [2]. Increasing amounts of public revenue are allocated for debt servicing purposes thereby making funds unavailable for other sectors that requires attention.

What appears indisputable is the increasingly large debt servicing requirement which imposes considerable stress on the Nigerian economy even when the improved resources inflow is factored into the country's cash flows [12]. Investment has been depressed owing to large debt servicing payment obligation and debt burden through its illiquidity. Irrespective of Nigerian government's determined effort in managing public debt, the issue of debt has been a burden to the Nigerian economy. However, lack of judicious use of loaned fund for the betterment of lives of the citizenry by allocation of such funds to the productive sectors of the economy has affected the stimulating and stabilization effect of deficit financing for the development of Nigerian economy. It is against the backdrop, that this study therefore aims to ascertain the effect of public debt on the economic development in Nigeria.

1.3 Objectives of the Study

The broad objective of the study is to ascertain the effect of public debt on the economic development in Nigeria during the period 2000 to 2023.

The specific objectives are:

1. To investigate the effect of domestic debt on economic development in Nigeria.
2. To determine the effect of bilateral debt on economic development in Nigeria.
3. To assess the effect of multilateral debt on economic development in Nigeria
4. To ascertain the effect of debt servicing on economic development in Nigeria.

1.4 Research Hypotheses

The hypotheses tested in this study are stated in the null form. They include:

$H0_1$: Domestic debt has no significant effect on economic development in Nigeria.

$H0_2$: Bilateral debt has no significant effect on economic development in Nigeria.

$H0_3$: Multilateral debt has no significant effect on economic development in Nigeria.

$H0_4$: Debt servicing has no significant effect on economic development in Nigeria.

2.0 Literature Review

2.1 Conceptual Review

Public debt sometimes referred to as national or government debt, represent total debt which a country owes to its citizens and to residents, institutions and governments of foreign countries [2]. It is the total outstanding debt obligation or accumulated borrowing of the national government. The history of public debt in Nigeria can be traced to the 1920s when the

government secured loans from external sources for the purpose of creating and expanding infrastructural facilities, which include roads railways as well as telegraph services [13]. The need to meet up with financing the rising expenditure by the government leads to acquiring debt. Nigeria's public debt stock includes external (bilateral and multilateral) and domestic debt stock. Nigeria like some other countries is in public debt. While in some countries, public debt has helped in aiding economic growth, the same cannot be said for Nigeria. Public debt has a defining feature which is limited mechanism for enforcement [14]. This distinguishes public debt from private debt, whether domestic or foreign. A private agent or corporation, at least technically, is always subject to a legal authority; sovereign nations are not. International bonds and bank loans are typically issued or contracted in a major financial center, such as New York or London. As such, they are subject to the legal jurisdiction of the place of issue [15]. If a sovereign debt or fails to make a contracted payment, creditors have limited legal recourse, relying only on foreign legal instruments and reputational considerations.

A bilateral loan is a loan involving a single lender. There may be a single borrower or multiple obligor involved, i.e the borrower and other companies in the borrower's group as guarantee and security provider. Bilateral loans are usually used where less complex financing arrangements are required and loans of relatively small amounts needed [16]. Where a larger loan is needed by the borrower, a single lender may be reluctant and unable to dole the full amount required by the borrower. In these cases, a syndicated or club loan may be a better option. Borrowers can typically anticipate scheduled interest rate payments over a specified period. They are traditional bank loans usually used by smaller businesses because of their simple structure. Kuhl [16] stated that commercial lenders need to have confidence that borrowers will predictably repay a loan to ensure their own regulatory compliance, business conformity, and growth.

Multilateral debt is that portion of a country's external debt burden owed to international financial institutions (IFLs) such as the World Band and International Monetary Fund (IMF) [17]. Because of the international financial institution's status as "preferred creditor," as providers of core development and balance-of-payment loans, most of the world's poorest countries prefer multilateral debt to other debts. In this context, status means that payment to them must be given highest priority over private and bilateral debts. Writing off debts is not obtainable with international financial institutions, as government and private creditors often do. Governments have special incentive to stay current with their multilateral debts, since international financial institutions determine the creditworthiness of countries [17]; until the IMF gives its stamp of approval, which usually requires adherence to the economic policies it recommends, poor countries generally cannot get credit or capital from other sources.

The collection of principal repayments and interest to be paid in currency, goods or services on long term debt and short term debts makes reference to debt servicing [18]. Debt servicing is the payment of interest accruing to a borrowed fund. Most developing countries rely on both domestic and external loans to finance their various governmental projects due to insufficient financial resources in their economies. These loans quite naturally need to be repaid. The repayment will be that of principal and interest. Debt servicing has become a burden to developing countries. Due to poor revenue generation among the developing countries, debt servicing has drained the remaining resources at government disposal. Government intention of sourcing any loan is aimed at achieving some macroeconomic objectives of economic growth and stability. The payment and servicing of such loans are public expenditure. Hence, the cost of servicing public debt may go beyond the capacity of the economy to cope, thereby impacting negatively on the ability to achieve the desired fiscal and monetary policy objectives [19]. The magnitude of debt burden facing most developing countries may constitute an

inhibition to the ability of government to embark on more productive investment in infrastructure, health care services and education etc. the accompanying problem of payment of principal and interest directly affects infrastructural development in Nigeria.

Economic development refers to the focus of government to make improvements on the standard of living through job creation, innovative support, the creation of wealth, and overall creating a better quality of life. Economic development ties closely to growth but a bit different form growth as economic growth is just a mere increase in productivity, according to Akaegbobi, Nworie and Uzodimma [20]. Nigeria has the continent's biggest economy, a huge military budget and it active in the West African and African continent. The Nigeria economy is changing and it is shifting from mainly primary based economy reliant on farming and extractive industries, to one which is making more money or GDP from manufacturing (secondary industries) and more services in the tertiary sector [21]. Nigeria is no longer to be classified as low income country (LIC) it is a Newly Emerging Economy (NEE) with a Gross National Income (GNI) of US$ 5,360. The economy of Nigeria grew at a massive 7 percent per year. The oil industry has been one of the drivers of this change, but more recently, it has been the growth of manufacturing and services that are helping the Nigerian economy grow.

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2.1.1 Public Debt and Economic Development

A prudent debt management helps economic development and stability through mobilizing resources with low borrowing cost and limiting financial risk exposure [2]. Governments use public debt as an instrument to finance its budget deficit. On the contrary, if the public debt is not properly utilized, it would hinder economic development and become detrimental to the economy. Domestic debt if not properly used can have a severe implication for the economy because its servicing will make serious inroad in government revenue thereby creating a persistent deficit. The implication of this is that government will have lesser resources to spend on developmental projects. There has been a lot of emphasis on continuous borrowing by Government in the short-run to finance economic growth and create the basis for economic development for the long-run piloted mechanism for economic stimulant that will trigger private sector contribution [1]. Unfortunately, this assumption has proved otherwise, leading to debt overhang and counterproductive. Udunwoke and Nworie [1] argued debt overhang arises when a country's debt is so large such that the country will be unable to take additional debt to finance future projects, dissuading current investment.

Country's over reliance on both bilateral and multilateral loan to augment capital formation is the major reason that causes public debt to rise. If the interest is high, the deficit on the current account will also be high, thereby resulting heavy debt burden. The negative effects of public that are likely to increase with higher public debt levels due to more uncertainty. A negative long-run effect of public debt on growth can be due to crowding- out mechanism; if increased fiscal deficit leads to higher interest rate, this may crowd out investment in the private sector and invariably retard development.

2.2 Theoretical Framework

This study is anchored on the Dual-Gap Theory. This theory was propounded by Harod and Domar in 1946 [22]. The theory provides the framework that development is dependent upon two crucial factor, namely domestic saving rate and capital-output ratio. Dual gap theory was made in the context of foreign aid or borrowing of capital by developing countries that can be used to bridge the gap which will in turn bring rapid economic development. This foreign aid or borrowing was as a result of insufficient domestic savings and investment. The basic

underlying assumption of dual-gap theory is lack of sustainability of domestic saving and the investment required to take-off that creates shortfall and makes nations to borrow to finance their expenditure [23]. The dual-gap theory was coined from a national accounting identity which implies that excess investment expenditure (investment-saving gap) is equivalent to the surplus of import over export (foreign exchange gap). However, most economies have experienced shortfall in trying to bridge the gap between the levels of savings and investment and have resorted to external debt. Gap between savings and investment is the motive for acquiring both domestic and external debt.

2.3 Empirical Review

Asravor et al [24] investigated domestic debt sustainability and economic growth in Ghana. The main aim of the study was to examine Ghana's domestic debt, its sustainability on economic growth rate and the causal relationship between debt and growth. Using data from the World Bank and the ministry of finance for the period between 1994 and 2018. ARDL model was used to examine the effect of domestic debt on economic growth and private sector investment. Co-integration and fully modified regression was used to examine debt sustainability. Findings revealed that increase in Ghana's domestic debt are growth-enhancing while increase in importation is growth-inhibiting.

Abille, and Kilie [25] investigated an asymmetric relationship between public debt and economic growth in Ghana. The main aim of the study was to examine the asymmetric effect of public debt on economic growth in Ghana. Annual series data from 1970 to 2019 was used. The nonlinear Autoregressive Distributive Lag (NARDL) bounds approach was employed. Findings showed that a positive shock to public debt insignificantly impacted the growth of the economy in the short and long runs. Also, a negative shock to public debt exerts significant short-run negative and insignificant long-run positive effects on the growth of the economy.

Chukwu [15] examined the impact of public debt and debt servicing on economic growth in Nigeria. The main objective of the study was to examine the impact of public debt servicing on economic growth in Nigeria. Secondary data collected from central Bank of Nigeria Statistical Bulletin was used by the study. Ordinary Least Square (OSL) was used in estimating the relationship between the dependent and independent variables. The result showed that public debt servicing has no significant impact on economic growth in Nigeria and thus insignificant variable in determining economic growth in Nigeria. In addition that public debt servicing has negative relationship with economic growth in Nigeria and finally that there is no causality relationship between public debt servicing and economic growth in Nigeria.

Fijah and Iheaturu [26] examined the empirical analysis of the effect of public debt on the economic growth in Nigeria. The main objective of the study was to determine the effect of public debts proxied as internal debts, external debts and interest rate on economic growth. The study applied ex-post facts research design with secondary data as instrument for data collection. Multiple regression model, applying Ordinary Least Square (OLS) regression was used for analysis. Findings showed that external debts have insignificant negative impact on GDP while internal debts showed significant positive impacts on FDP.

Abdulkarim and Saidatulakmal [27] examined the linear effects public debt on economic growth in Nigeria. The main objective of the study was to examine the asymmetric impact of public debt on economic growth in Nigeria from 1980 to 2020 using the nonlinear Autoregressive Distributed Lag method. Data were sourced Debt Management Office (DMO) Central Bank of Nigeria Statistic Bulletin and National Bureau of Statistics (NBS). Empirical evidence indicated that external debt has a significant positive and symmetric impact on

economic growth in the long and short run, while debt service payment supporting the debt overhang hypothesis activated a symmetric effect the stifle growth. Domestic debt retarded growth asymmetrically in the short term and linearly over the long term. Foreign reserved holding on the other hand, had an asymmetric long-run influence and a symmetric short-run impact on growth.

Ikeobi [28] assessed the impact of domestic debt on the Nigerian economy. The main objective of the study was to assess the impact of domestic debt on the Nigerian economy from 2008 to 2020. The study used secondary data which were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin. The data were analyzed through the use of multiple regression model and Ordinary Least Square (OLS) model. Result showed that Treasury bills have not significantly impacted the economy, while Government bonds exhibited significant positive impact on the economy meaning that Nigeria has been able to effectively utilize long-term debts rather than short-term debts.

Hlongwane [29] assessed the consequential effects of public debt on economic growth in South Africa. The main aim of the study was to examine the effect of public debt on economic growth in South Africa. The study adopted *ex-post facto* research design and data were gotten from secondary sources. The study employed ARDL bound to estimate the long and short run relationship among several macroeconomic variables, real economic growth, domestic debt, external debt, budget deficit, inflation rate and investment. An error correction model was used to analyze the short-run disequilibrium. Findings revealed that there is short and long run equilibrium relationship between foreign debt, domestic debt, budget deficit, inflation rate and economic growth. The empirical result showed that external debt negatively affects the real GDP growth in South Africa, both in the short and long-run.

Sharaf and Shahen [30] examined the symmetric and asymmetric impact of external debt on inflation in Sudan from 1970 to 2020. The main aim was to examine the symmetric and asymmetric impact of external debt on inflation in Sudan from 1970 to 2020 within a multivariate framework by including money supply and nominal effective exchange rate as additional inflation determinants. The study utilized Auto Regression Distributive Lag (ARDL) model to examine the symmetric impact of external debt on inflation, while the asymmetric impact is examined using a nonlinear ARDL (NARDL) model. The existence of a long-run relationship between inflation and external debt was tested using bounds-testing approach to co-integration, and a vector error-correction model is estimated to determine the short parameters of equilibrium dynamitic. Findings revealed that external debt has no statistically significant impact on inflation in the long run. The result of the NARDL model showed that positive and negative external debt shocks statistically affect inflation in the long run. The results also revealed that the domestic money supply has a statistically significant positive impact on inflation.

Alemu, Choramo and Jeldu [31] assessed external debt, institutional quality and economic growth in East African countries. The main aim of the study was to analyze the impact of external debt on economic growth with mediating role of institutional quality. The study used secondary data. The institutional quality was achieved by employing a heterogeneous panel Autoregressive distributed lag (ARDL) model through a pooled mean group (PMG) estimator over period of 22 years spanning from 1988 to 2019 in East African countries. The results showed a significant long-term positive relationship between the stock of external debt as a percentage of GNI and economic growth. The positive effect of external debt in limited to a threshold level of 62.9%. The result went further to show that institutional qualities in direct effect on external debt interaction had a significant positive impact on economic growth,

indicating that the negative impact of external debt on economic growth decreased as the region's institutional quality rose.

Abate [32] examined the nexus between public debt and economic growth in Ethiopia. The main aim of the study was to examine the nature of relationship between public debt and economic growth in Ethiopia. A time series data was collected over the period 1982 to 2018. Nonlinear ARDL and multiple thresholds nonlinear ARDL models were used to uncover whether the relationships between debt and economic growth of Ethiopia is asymmetric. Instrumental variables regression model with a quadratic specification was used to test threshold effect of debt. The findings showed that there are evidences that supported the existence of asymmetric relationship between the indicated variables. It was found that a major positive shock in debt was favourable to economic growth while the effect of minor and negative shock to debt was unfavorable.

Oyadeyi et al [33] empirically examined the effect of debt on economic growth in Nigeria. The main objective of the study was to examine the threshold effect of debt on growth in Nigeria, with a view to investigating debt sustainability levels in the country. Time series quarterly data spanning from 1981 to 21 was used. The study employed two-regime threshold Autoregressive distributed model regression approaches. Findings from the study revealed that the optimal thresholds for total debt as a ratio of GDP (TDB/GDP) GNI (TDB/GNI), total revenue (TDB/REV) and exports of goods and services (TDB/EXP) are 46.1%, 54.5%, 385.3%, and 24.9% respectively. Results also showed that debt ratios below the threshold levels have a significant positive impact on economic growth. This is true for all debt ratio. However, debt ratio above the threshold levels have a negative and significant effect on Nigeria's economic growth. In addition, results showed that only the level of domestic debt is sustainable over the long and short run whereas external debt and total debt are only sustainable over the long run.

2.4 Gap in Literature

Based on the literature review, the following gaps have been identified. Firstly, most research works on the effect of public debt in Nigeria are always tested on economic growth. Secondly, most research works on the effect of public debt on economic development in Nigeria stopped at 2020. Thirdly, most research work on the effect of public debt on economic development in Nigeria is anchored on Keynesian theory. To close these gaps, this study tested the effect of public debt in Nigeria on economic development as against the usual economic growth. Secondly, this research on the effect of public debt on economic development is extended to 2023. Finally, this research work is anchored on dual-gap theory as against the usual Keynesian theory. Despite the wide variety (mainly empirical) explanations and insight on the debt-development nexus, no unified theoretical proposal has been reached yet.

3.0 Methodology

Ex-post facto research design is adopted in carrying out the research. *Ex-post facto* is an offshoot of experimental research design. *Ex-post facto* research, as noted by Aggreh, Abiahu and Nworie [34] and Nworie, Onyeka and Anaike [35] more formally as that in which the independent variable(s) have already occurred in which the researcher starts with the observation of a dependent variable(s), the researcher then studies the independent variables in retrospect to their possible relationship and effect on the dependent variable.

This study covers the effect of public debt on economic development in Nigeria spanning from 2000-2023 with special emphasis on domestic debt, bilateral debt, multilateral debt and debt

servicing. A total period of 24 years is covered by the study. Nigeria is the center piece of this research work.

This study used secondary data sourced from Debt Management Office (DMO), Central Bank of Nigeria Statistical Bulletin, United Nation Development Programme (UNDP) Bulletin and National Bureau of Statistics (NBS). Data were also extracted from World Bank Database and related journals.

To estimate the regression equation, the study adopted the general multiple ordinary least square (MOLS) regression model base in line with the specific objectives variables of the study. The regression model is specified by Frances Galton (1974) thus;

$Y = a + bx$ …….. equation (1)

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Probability is a function of HDI. However, for proper flow and measurement of variable functions in this study, we proxied development with HDI. To express the model of multiple regression in equation that was modified to suit the respective hypotheses, ordinary least square method was involved. The multiple linear regression allows OLS tool to test how well to predict the dependent variable on the basis of multiple independent variables.

Thus, the model is stated as follows

$Y_1 = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + Uit$ ……. (2)

To boost the robustness of the model, inflation was introduced as a control variable. Thus, the equation became;

$Y_1 = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5 INF_5 + Uit$ ……. (3)

Where; Y_1= Dependent variable, X1……X5 = Independent variable

This model is modified and expressed as follows.

$HDI = B_0 + B_1DDEBT_1 + B_2BDEBT_2 + B_3MDEBT_3 + B_4DESERV_4 + B_5INF_5 + Uit$ ……. (4)

Where;

HDI	=	Human Development Index
DDEBT	=	Domestic debt
BDEBT	=	Bilateral debt
MDEBT	=	Multilateral debt
DESERV	=	Debt servicing
INF	=	Inflation
B_0	=	Intercept
$B_1 \ldots B_5$	=	Coefficient of parameter estimate and;
Uit	=	Gaussian white noise.

HDI: Human Development Index: Is measured by life expectancy at birth, mean and

expected years of schooling and GNI/Capital.

DDEBT: Domestic Debt: This is measured in this study as the total amount in figures of national debt owed by Nigerian government internally.

DDEBT: Bilateral Debts: This is measured operationally in this study as the total amount in figure of national debt owed to other countries.

MDEBT: Multilateral Debt: In this study we measured MDEBT operationally using the value of total national debts in figure owed to International Financial Institution (IFIs)

DEBTSERV: Debt servicing: We operationally measured this as the total amount in figures used by the Nigerian Government in servicing her national debts.

INF: Inflation: This is measured in this study as the annual inflation figure.

The time series data gathered were estimated using the multiple regression involving ordinary Least Square (OLS) model with Error Correlation Model. Furthermore, statistical test such as F-Statistic and Durbin Watson test were conducted to test the overall significance of the regression equation and the presence or otherwise of autocorrelation among explanatory variables at 5% level of significance, while some diagnostic tests were also carried out on the regression model in order to test the reliability and validity of the historical time series data, with the aid of E-view 13.0 econometric software. Other statistical tests were Augmented Dickey Fuller (ADF), Unit Root Test, and Johansen Co-integration Test among others. The multiple regression were estimated using the conventional probability values (p-value) associated with the regression outcome of the research base line model.

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4.0 Data Analysis

4.1 Descriptive Statistics

The descriptive statistics used in the study are mean, median, mode, standard deviation (Std. Dev.) Skewness, kurtosis and the Jarque-Bera (JB) test. Table 1 below provides the summary statistics for Economic development, domestic debt, bilateral debt, multilateral debt, debt servicing and inflation rate (control variable).

Table 1: Descriptive Statistics

	HDI	LDDEBT	LBDEBT	LMDEBT	LDESERV	INFL
Mean	0.496958	8.514165	5.354184	7.020576	6.625660	13.23826
Median	0.495500	8.659954	4.975812	6.657913	6.394302	12.70720
Maximum	0.538000	10.82369	8.000172	9.671377	9.173046	27.33000
Minimum	0.439000	6.800448	3.108614	5.141091	4.875579	5.388000
Std. Dev.	0.031022	1.140864	1.523143	1.292679	1.209521	4.784065
Skewness	-0.174380	0.086063	0.231036	0.575814	0.432594	0.871801
Kurtosis	1.762740	1.908187	1.919115	2.085302	2.169884	4.318079
Jarque-Bera	1.652446	1.221683	1.381822	2.162919	1.437643	4.777478
Probability	0.437699	0.542894	0.501119	0.339100	0.487326	0.091745
Sum	11.92700	204.3400	128.5004	168.4938	159.0158	317.7182

Sum Sq. Dev.	0.022135	29.93611	53.35917	38.43342	33.64767	526.4074
Observations	24	24	24	24	24	24

Sources: Descriptive Analysis, 2024 From E-view 13, version.

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The mean values for economic development, domestic debt, bilateral debt, multilateral debt, debt servicing, and inflation rate are approximately 0.496958, 8.514165, 5.354184, 7.020576, 6.625660, and 13.23826 respectively. Domestic debts (DDEBT) after the control variable, inflation rate (INFL) display the highest mean; this shows that the annual changes in domestic debts are of great significance compared to the other variables, followed by multilateral debt, debt servicing, bilateral debt and economic development. This is an indication that control variable, inflation rate (INFL) followed by domestic debts are the most sensitive to changes among the variables. The standard deviation ranges between 0.031022 and 4.784065. This shows that inflation rate (INFL) have the highest magnitude of variation and economic development the lowest Skewness and kurtosis are measures that indicate whether a time series follows a normal distribution. The data reveals that all the independent and control variables (DDEBT, LBDEBT, LMDEBT, LDESERV and INFL) are positively skewed, while the dependent variable (HDI) is negatively skewed. This indicates that all the independent and control variables (DDEBT, LBDEBT, LMDEBT, LDESERV and INFL) have a right tail and data points that are greater compared to those of dependent variable (HDI). Kurtosis measures the sharpness ofthepeaks.Thevaluesforkurtosisrangefrom1.762740 to4.318079 indicating that the time series plot for the six variables has flat peaks.

However, Jarque Bera test is based on a large sample and OLS residual tests, Gujarati & Porter (2009). The Normality is considered an essential test and one of the diagnostic tests that can declare the study's credibility. The normality test helps the test of confidence intervals and significance to become valid. If there is no normality in the regression, the P-values for the overall F-test and T-test will be incorrect. Therefore, the Jarque is introduced to examine the normality and error term in the regression model. Meanwhile, the above result of Jarque Bera is inconsequential considering the size of the sample.

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Table 2: Unit Root Test Results

Variable	Level				1st Difference				Or of in
	ADF Statistic	5% Crit value	P-value	Remark	ADF Statistic	5% Criti value	P-value	Remark	
HDI	-1.6769	-2.9981	0.4291	Non-stationary	-5.4695	-3.0049	0.0002	Stationary	I(1)
LDDEBT	0.5766	-2.9981	0.9857	Non-stationary	-3.9924	-3.0049	0.0061	Stationary	I(1)
LBDEBT	0.9304	-2.9981	0.9941	Non-stationary	-7.3735	-3.0123	0.0000	Stationary	I(1)
LMDEBT	2.8679	-2.9981	1.0000	Non-stationary	-3.1647	-3.0049	0.0362	Stationary	I(1)
LDESERV	0.6019	-2.9981	0.9865	Non-stationary	-5.2162	-3.0049	0.0004	Stationary	I(1)
INFL	-2.0907	-2.9981	0.2498	Non-stationary	-5.6179	-3.0049	0.0002	Stationary	I(1)

Source: Author's Computation 2024 using E-views 13

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From Table 2 above, the result reveals that none of the variables was stationary at level, because at this point, the ADF statistics were less than the 5% critical values in absolute terms, and their p-values were each greater than 0.05. At the first difference though, all the variables became stationary following the decision criteria set out above. As indicated in the last column of the table, the variables were each integrated of order one (1), that is, I(1); hence they have the same order of integration. Consequently, there was need for Johansen cointegration test and as such, was employed to test for the existence of cointegration or long-run relationship among the variables of the study model.

TESTING FOR LAG ORDER IN THE VAR

Table 3: Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: HDI LDDEBT LBDEBT LMDEBT LDESERV INFL
Exogenous variables: C
Date: 01/06/24 Time: 12:19
Sample: 2000 2023
Included observations: 22

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-22.88165	NA	5.57e-07	2.625604	2.923161	2.695700
1	104.5010	173.7037	1.57e-10	-5.681913	-3.599014	-5.191244
2	171.5685	54.87339*	2.35e-11*	-8.506228*	-4.637987*	-7.594987*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

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Table 3 above shows the test statistics and the criteria for selecting the order of the VAR model. The test included 2 lags for the lag specification. The LR, FPE, AIC, SC and HQ tests recommend a lag of order 3.Considering that most of the tests selected VAR (2), order 2 is the most appropriate for this test. Therefore, the selected lag was used in the Johansen cointegration test and in estimating the vector error correction model. The results for the cointegration test are presented below.

Johansen Cointegration Test Results

The Johansen (1991) cointegration technique is employed to test whether HDI, LDDEBT, LBDEBT, LMDEBT, LDESERV, and INFL have a long-run relationship. It has been established that all the variables become stationary at their first difference, meaning that economic development, domestic debt, bilateral debt, multilateral debt, debt servicing, and inflation rate (control variable) are integrated of order I(1), hence the cointegration test was then carried out. The VAR order of 2 has been established, thus the maximum likelihood tests (Trace test and Maximum Eigen Value test) for cointegration are applied. The results of the Trace test and Maximum eigenvalue tests are presented in Table 4 and Table 5 respectively.

Table 4: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.** Critical Value
None*	0.955756	185.1745	95.75366	0.0000
Atmost 1*	0.877867	116.5778	69.81889	0.0000
Atmost 2*	0.779850	70.31966	47.85613	0.0001
Atmost 3*	0.679921	37.02385	29.79707	0.0062
Atmost 4	0.418908	11.96170	15.49471	0.1588
Atmost 5	0.000868	0.019099	3.841465	0.8900

Trace test indicates 4 cointegrating equation(s)atthe0.05level*denotes rejection of the hypothesisatthe0.05 level**MacKinnon-Haug-Michelis (1999) p-values

Table 5: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**Critical Value
None*	0.955756	68.59664	40.07757	0.0000
Atmost 1*	0.877867	46.25817	33.87687	0.0010
Atmost 2*	0.779850	33.29581	27.58434	0.0083
Atmost 3*	0.679921	25.06215	21.13162	0.0133
Atmost 4	0.418908	11.94261	14.26460	0.1128
Atmost 5	0.000868	0.019099	3.841465	0.8900

Max-eigenvalue test indicates 4 cointegrating equation(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mac Kinnon-Haug-Michelis (1999)p-values

According to the results in Table 4 above, the Trace test revealed the existence of four cointegrating equations at a 5% significance level. Therefore, it can be concluded that there is an existence of a stationary, long-run linear relationship between the variables. In the same vein, the Maximum Eigenvalue as shown in Table 5 indicates that there is existence of four cointegration equations at a 5% significance level. Therefore, there is also evidence of a relationship in the long run. Meanwhile, there is no contrast or conflicting results between Trace and Maximum Eigenvalue, thus, the positions of the two authorities do not apply. However, alternative measures can be used to evaluate the extent of cointegration that exists between variables. Further tests, in the underlying study, are conducted on the assumption that the results yielded by the Trace and Maximum Eigenvalue tests are correct. The Granger causality test was performed to determine the direction of causality between the variables.

Table 6: Cointegrating Vector for HDI, DDEBT, LBDEBT, LMDEBT, LDESERV and INFL

4 Cointegrating Equation(s)			**Log likelihood**	**114.2650**	
HDI	LDDEBT	LBDEBT	LMDEBT	LDESERV	INFL
1.0000	-0.016046	0.407687	-0.428994	0.012068	0.040911

(0.10887)	(0.02672)	(0.08303)	(0.09466)	(0.00830)	

Normalized cointegrating coefficients (standard errorin parentheses)

Source: Author's Computation 2024 using E-views 13

The long term equilibrium vector is estimated to be Z = HDI -0.0160LDDEBT +0.4077LBDEBT -0.429LMDEBT + 0.0121LDESERV -0.041INFL. The coefficient of LDDEBT has a standard error of 0.10887and is significant. The coefficient of LBDEBT has a standard error of 0.02672and is significant. The coefficient of LMDEBT has a standard error of 0.08303and is also significant. Likewise, the coefficient of LDESERV has a standard error of 0.09466and is also significant. The coefficient of the control variable (INFL) has a standard error of 0.00830and is also significant. HDI is denoted as the dependent variable and LBDEBT, LDDEBT, LMDEBT, and LDESERV as the independent variables while, INFLL is the control variable. Therefore, in the long run, LDDEBT, LMDEBT and the control variable (INFLL) have positive impacts on HDI while LBDEBT and LDESERV have negative impacts on HDI, on average, ceteris paribus. Additionally, for every 1% increase in economic growth (human development index), domestic debts rise by .02% in the long run. Likewise, for every 1% increase in economic growth (human development index), domestic debts rise by 0.41% in the long run. In conclusion, the null hypothesis of no cointegrating relationship in the model is rejected. The study focuses on testing the relationship between HDI, LBDEBT, LDDEBT, LMDEBT, LDESERV and the control variable (INFL).

VECM Estimation Results

The study utilizes the VECM to model the short-run and long-run impacts and relationships among Economic development, domestic debt, bilateral debt, multilateral debt, debt servicing, and inflation rate (control variable).Table 6 summarizes the results of the VECM as stated below.

Table 7: Summary of VECM Result

Independent variables	ECT	LDDEBT	LBDEBT	LMDEBT	LDESERV	INFL	Constant
Dependent variable: HDI							
Long-run result							
Regression coefficients	N/A	-0.016046	0.407687	-0.428994	0.012068	0.040911	0.904340
T-statistics		-2.14739	15.2577	-5.16684	0.12748	-4.92714	N/A
Short-run result							
Regression coefficients	-0.273773	-0.464616	0.123149	-0.268889	0.020241	-0.002033	0.245835
T-statistics	-3.827815	-1.558838	1.918250	-1.562422	0.187807	-0.446148	2.937856
P-values	0.0018	0.1413	0.0257	0.1405	0.8537	0.6623	0.0108

Stat properties: R-squared = 0.594621; Adj. R-squared = 0.391932; F-statistic = 2.933657Prob (F-statistic) = 0.0411

Source: Researcher's computations 2024 from E-Views 13 (complete result in Appendix B)

The upper panel of Table 7 shows the long-run relationship while the short-run relationship is shown in the lower panel.

Normalized Cointegrating Equation = HDI -0.0160LDDEBT + 0.4077LBDEBT - 0.429LMDEBT + 0.0121LDESERV +0.041INFL.

The Coefficients signs should be reversed in the normalized cointegrating equation of Johansen model which is representing the long run. HDI is the target variable. LDDEBT has a positive and significant impact on HDI in the long run. An increase in LDDEBT will lead to an increase in HDI. In the case of LBDEBT, it is negative and significant. An increase in HDI will lead to a decline in HDI. Also, LMDEBT is positive and significant. An increase in HDI will lead to an increase in HDI. However, DESERV is negative and not significant but, the control variable (INFL) is negative and significant.

Error correction coefficient gives the speed of adjustments within which the model will restore its equilibrium following any disturbances. The coefficients of ECT with HDI, LDDEBT and LBDEBT as dependent variable are negative and statistically significant indicating that there is a convergence from short dynamics towards long run equilibrium. The adjustments coefficients were 0.02 percent, 27 percent and 0.57 percent respectively towards long run equilibrium in case of disequilibrium situation. In the case of LMDEBT the adjustment coefficient is positive and significant so also, the control variable which also indicates significant adjustments towards long run equilibrium in any disequilibrium situation. However, LDESERV is positive and not significant since the t-statistics is less than 2.The result of ECT which shows -0.02 is interpreted to mean that about 0.02% of the errors arising from disequilibrium in the previous period are corrected in the current period. Thus, the relationship is expected to return to steady-state or stable condition within few years.

Table 8: VECM System Order Result

Dependent Variable: D(HDI)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 01/12/24 Time: 15:21
Sample (adjusted): 2002 2023
Included observations: 22 after adjustments
D(HDI) = C(1)*(HDI(-1) - 0.0160461166003*LDDEBT(-1) +
0.407686913053*LBDEBT(-1) - 0.42899440177*LMDEBT(-1) +
0.0120679146574*LDESERV(-1) - 0.0409108936314*INFL(-1) +
0.904339588764) + C(2)*D(HDI(-1)) + C(3)*D(LDDEBT(-1)) + C(4)
*D(LBDEBT(-1)) + C(5)*D(LMDEBT(-1)) + C(6)*D(LDESERV(-1)) +
C(7)*D(INFL(-1)) + C(8)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.273773	0.071522	-3.827815	0.0018
C(2)	0.214220	4.441527	0.048231	0.9622
C(3)	-0.464616	0.298053	-1.558838	0.1413

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C(4)	0.123149	0.064199	1.918250	0.0257
C(5)	-0.268889	0.172097	-1.562422	0.1405
C(6)	0.020241	0.107775	0.187807	0.8537
C(7)	-0.002033	0.004557	-0.446148	0.6623
C(8)	0.245835	0.083679	2.937856	0.0108

R-squared	0.594621	Mean dependent var	0.154505
Adjusted R-squared	0.391932	S.D. dependent var	0.097717
S.E. of regression	0.076199	Akaike info criterion	-2.035656
Sum squared resid	0.081288	Schwarz criterion	-1.638913
Log likelihood	30.39221	Hannan-Quinn criter.	-1.942195
F-statistic	2.933657	Durbin-Watson stat	1.740159
Prob(F-statistic)	0.041086		

Source: Researcher's computations 2024 from E-Views 13

From table 8 above, the long run coefficient C (1) is negative and significant which shows long run causality between LDDEBT, LBDEBT, LMDEBT, LDESERV and INFL to HDI. Coefficient should have a negative sign showing the ability to bounce back to equilibrium. The positive sign indicates movement away from equilibrium. In the short-run relationship, the study transformed the regression into system format which was estimated by Ordinary Least Squares (OLS) so as to obtain relevant statistics of the result such as the p-values which the VECM method did not contain. It should be noted that short-run, as used in this study, refers to not-very-long a time. Considering the short run coefficient C (2) which represents Human Development Index (HDI, a percentage increase in itself (HDI) will lead to an increase in HDI by 0.21 percent. The short run coefficient C (3) which represents LDDEBT shows that a percentage increase in LDDEBT will lead to a decrease in HDI by 0.46 percent. The short run coefficient C (4) which represents LBDEBT shows that a percentage increase in LBDEBT will lead to an increase in HDI by 0.12 percent. The short run coefficient C (5) which represents LMDEBT shows that a percentage increase in LMDEBT will lead to a decrease in HDI by 0.27 percent. The short run coefficient C (6) which represents LDESERV shows that a percentage increase in LDESERV will lead to an increase in HDI by 0.02 percent. More so, the short run coefficient C (7) which represents control variable (INFL) shows that a percentage increase in INFL will lead to a decrease in HDI by 0.00 percent. C (8) is constant or intercept.

HETEROSCEDASTICITY TEST

Table 9shows the joint heteroscedasticity test for the estimated VECM. The test determineswhethertheestimatedmodelishomoscedasticorheteroscedastic

Table 9: VECM Joint Residual Heteroscedasticity Tests

Chi-sq	Df	Prob.
308.0000	294	0.2756

The results for the heteroscedasticity test shown in table 8 is used to test for conditional heteroscedasticity. The chi-square probability value is 0.2756 which is greater than the 0.05

critical value. Therefore, the null hypothesis cannot be rejected. It can be concluded that the model is not heteroscedastic.

SERIAL CORRELATION TEST

The LM test is performed to detect the presence or absence of serial correlation in the estimated residuals. The serial correlation LM test for the estimated VECM is shown in Table 10.

Table 10: VEC Residual Serial Correlation LM Tests

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	Df	Prob.	Rao F-stat	Df	Prob.
1	31.14352	36	0.6987	0.696876	(36, 15.9)	0.8194
2	34.32199	36	0.5485	0.812329	(36, 15.9)	0.707
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	Df	Prob.	Rao F-stat	Df	Prob.
1	31.14352	36	0.6987	0.696876	(36, 15.9)	0.8194
2	708.1387	72	0	NA	(72, NA)	NA

*Edgeworth expansion corrected likelihood ratio statistic.

Source: Researcher's Computations 2024

The null hypothesis being tested is that there is no serial correlation in the estimated system least squares result under reference. The decision rule is as follows: reject the null hypothesis if the p-value of the F-statistic is less than 0.05; otherwise uphold. Going by the result on table 10 above, we observe that the concerned p-value is 0.8194. Guided by the stated decision rule, we upheld the null hypothesis given that the p-value is greater than 0.05. Accordingly, we conclude that there is no serial correlation in the estimated system least squares result under consideration. The absence of positive serial correlation suggests no autocorrelation, that is, the error terms of successive periods are serially independent. This satisfies the relevant assumption of the OLS regression method. The implication is that the estimated model is reliable for prediction purpose.

4.2 Test of Research Hypotheses

The parameter estimates and their probability values were considered at 5% level of significance. If the probability value of the parameter estimate is larger than 0.05, the decision criterion was to accept the null hypothesis and reject the alternate hypothesis. Table 6 was used to test the hypotheses (Summary of VECM Result).

Hypothesis I

$H0_1$: Domestic debt has no significant effect on economic development in Nigeria.

The coefficients of domestic debt (DDEBT**)**, both long-run (-0.016046) and short-run (-0.464616), reveal inverse associations with a p-value of 0.1413. According to the regression (VECM) results provided in table 6, DDEBT is negative and not significant statistically in affecting economic development (HDI), as evidenced by its P-value. The analysis confirmed the null hypothesis and concluded that the domestic debt had no meaningful effect on economic development in Nigeria because the level of significance (0.05) is smaller than the P-value [0.1413].

Hypothesis II

$H0_{2:}$ Bilateral debt has no significant effect on economic development in Nigeria.

The coefficients of billateral debt (BDEBT**)**, both long-run (0.407687) and short-run (-0.123149), reveal linear associations with a p-value of 0.0257. According to the test-statistics (VECM) results provided in table 6, BDEBT is positive and not significant statistically in affecting economic development (HDI), as evidenced by its P-value. The analysis confirmed rejection of null hypothesis and concluded that the billateral debt had positive and statistical effect on economic development in Nigeria because the level of significance (0.05) is greater than the P-value [0.0257].

Hypothesis III

$H0_{3:}$ Multilateral debt has no significant effect on economic development in Nigeria.

The coefficients of multilateral debt (MDEBT**)**, both long-run (-0.428994) and short-run (--0.268889), reveal inverse associations with a p-value of 0.1405. According to the regression (VECM) results provided in table 6, MDEBT is negative and not significant statistically in affecting economic development (HDI), as evidenced by its P-value. The analysis confirmed the null hypothesis and concluded that the multilateral debt had no meaningful effect on economic development in Nigeria because the level of significance (0.05) is smaller than the P-value [0.1405].

Hypothesis IV

$H0_4$ Debt servicing has no significant effect on economic development in Nigeria.

The coefficients of debt servicing (DEBSERV**)**, both long-run (0.012068) and short-run (0.020241), reveal linear associations with a p-value of 0.8537. According to the test-statistics (VECM) results provided in table 6, DEBSERV is positive and not significant statistically in affecting economic development (HDI), as evidenced by its P-value. The analysis confirmed the null hypothesis and concluded that the debt servicing had no meaningful effect on economic development in Nigeria because the level of significance (0.05) is smaller than the P-value [0.8537]. Thus, broadly at the short-run, public debt has no statistical significant effect on economic development in Nigeria. However, at the long-run, the public debt is expected to have statistical significant effect on economic development in Nigeria since most of the t-statistics of the variables are greater than 2.

4.3 Discussion of Findings

The coefficient of domestic debt (DDEBT), both long-run (-0.016046) and short-run (-0.464616), reveal inverse association with a p-value of 0.1413. According to the test-statistics (VECM) results provided in table 6 DDEBT is negative and not significant statistically in affecting economic development (HDI), as evidenced by its p-value. The analysis confirmed

the null hypothesis and concluded that domestic debt had no meaningful effect on economic development in Nigeria because the level of significance (0.05) smaller than the p-value (0.1413) Domestic debt has negative and no significant effect on economic development in Nigeria within the period under study. The finding that domestic debt has a negative and no significant effect on economic development in Nigeria is supported by Abdulkarim and Saidatulakmal [27], who found that domestic debt retarded growth asymmetrically in the short term and linearly over the long term, highlighting its adverse effects on economic growth. Similarly, Chukwu [15] observed that public debt servicing (which includes domestic debt) has no significant impact on economic growth in Nigeria, reinforcing the lack of significance noted in this study. However, Ikeobi [28] showed that government bonds (a component of domestic debt) exhibited significant positive impacts on the Nigerian economy, suggesting that the type of domestic debt plays a critical role. Contrarily, Asravor et al. [24] found that domestic debt in Ghana enhanced growth, suggesting that the negative effects of domestic debt might be specific to Nigeria's context.

The coefficient of bilateral debt (BDEBT), both long-run (0.407687) and short-run (-0.123149), reveal linear association with a p-value of 0.0257. According to the test-statistics (VECM) results provided in table 6, BDEBT is positive and not significant statistically in affecting economic development (HDI), as evidenced by its p-value. The analysis confirmed rejection of null hypothesis and concluded that the bilateral debt had positive and statistical effect on economic development in Nigeria because the level of significance (0.05) is greater than the p-value (0.025). Bilateral debt (BDEBT) has positive and insignificant effect on economic development in Nigeria within the period under study. The finding that bilateral debt positively but insignificantly affects economic development in Nigeria is consistent with Abille and Kilie [25], who found that positive shocks to public debt insignificantly impacted Ghana's economy in the short and long runs, implying that bilateral debt might have limited influence. Abdulkarim and Saidatulakmal [27] provided additional support by identifying asymmetric effects of public debt, where certain types of debt, including bilateral, may not significantly contribute to growth. In contrast, Alemu et al. [31] observed a significant long-term positive relationship between external debt (which includes bilateral debt) and growth, suggesting that bilateral debt's effectiveness might depend on institutional quality. Abate [32] further noted that major positive shocks to debt, potentially encompassing bilateral debt, can favor growth, challenging the insignificance found in this study.

The coefficient of multilateral debt (MDEBT), both long-run (-0.428994) and short-run (-0.268889), reveal inverse association with a p-value of 0.1405. According to the test-statistics (VECM) results provided in table 6, MDEBT is negative and not significant statistically in affecting economic development (HDI), as evidenced by its p-value. The analysis confirmed the null hypothesis and concluded that the multilateral debt had no meaningful effect on economic development in Nigeria because the level of significance (0.05) is smaller than the p-value (0.1405). Multilateral debt has negative and insignificant effect on economic development in Nigeria within the period under study. The finding that multilateral debt negatively and insignificantly affects economic development is aligned with Hlongwane [29], who found that external debt (including multilateral debt) negatively affects South Africa's GDP in both short and long runs. Oyadeyi et al. [33] further support this, noting that debt ratios above certain thresholds negatively and significantly impact Nigeria's growth, which could include multilateral obligations. Additionally, Sharaf and Shahen [30] observed that external debt had no statistically significant impact on inflation in Sudan, indirectly supporting the insignificance of multilateral debt. However, Alemu et al. [31] demonstrated a significant

positive relationship between external debt and growth when institutional quality improves, suggesting that governance factors may mediate the effects of multilateral debt.

The coefficient of debt servicing (DEBSERV), both long-run (0.012068) and short-run (0.020241), reveal linear association with a p-value of 0.8537. According to the test-statistics (VECM) results provided in table 6, DEBSERV is positive and not significant statistically in affecting economic development (HDI), as evidenced by its p-value. The analysis confirmed the null hypothesis and concluded that the debt servicing had no meaningful effect on economic development in Nigeria because the level of significance (0.05) is smaller than the p-value (0.08537). Debt servicing has positive and non-significant effect on economic development in Nigeria. The finding that debt servicing has a positive but non-significant effect on economic development is consistent with Chukwu [15], who observed that public debt servicing has no significant impact on economic growth in Nigeria and noted a negative relationship. Abdulkarim and Saidatulakmal [27] found that debt servicing activates a symmetric effect that stifles growth, indirectly supporting the limited positive significance observed. On the other hand, Oyadeyi et al. [33] indicated that debt servicing ratios below specific thresholds could positively impact growth, suggesting the potential for debt servicing to contribute under optimal conditions. Fijah and Iheaturu [26] observed that interest rates and debt servicing have minimal influence on GDP, further reinforcing the insignificance of debt servicing in fostering economic growth.

5.0 Conclusion and Recommendations

The objective of the study was to ascertain the effect of public debt on economic development in Nigeria. The study used annual time series data spanning from 2000 to 2023. Economic development (proxieds by HDI) was regressed on domestic debt, bilateral debt, multilateral debt and debt servicing. The results of the study revealed that there is negative and non-significant effect between domestic debt and economic development in Nigeria between the periods under study. There is positive and non-significant effect between bilateral debt and economic development in Nigeria between the periods under review. There is negative and non-significant effect between multilateral debt and economic development in Nigeria between the period under study, while there is a positive and non-significant effect between debt servicing and economic development in Nigeria between the periods under study.

It is therefore concluded based on the findings of this study that both domestic debt and multilateral debt have not been instrumental in enhancing the development of Nigerian economy. Both have not been productive in terms of their contribution to the development of Nigerian economy. The findings also revealed that bilateral debt has contributed slightly to the development of Nigerian economy within the period under review. It was also ascertained that debt servicing has also contributed minimally to the development of Nigerian economy within the period covered by this study. Based on the findings of the study, the researcher provides the following recommendations.

1. Domestic debt does not play any important role in the development process of Nigerian economy. Hence, the government should reduce the level of domestic debt accumulation.

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2. Government should acquire more bilateral loans that should be channeled into viable projects with high return on investment.

3. Multilateral debt has been unproductive in terms of its contribution to the development of Nigerian economy, government should avoid acquiring multilateral loans because of its negative impact on the economy.

4. Debt servicing requirement should not be allowed to increase above the debt stock by regularly servicing the loan.

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