International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

Empirical Analysis of the Impact of Public Debt on Some Selected Macroeconomic Variables in Nigeria(1980-2020)

El-Yaqub, Ahmad B.
Department of Economics
University of Abuja

Obida Gomna Wafure
Department of Economics,
Faculty of Social Sciences,
University of Abuja

Ibrahim Musa*
Department of Economics,
Faculty of Social Sciences,
University of Abuja

Date of Submission: 24-04-2024 Date of Acceptance: 02-05-2024

Abstract
This study investigates the impact of public debt on Nigeria's macroeconomic indicators, including real gross domestic product(RGDP), unemployment (UNEM), interest rate(INTR), and inflation rate(INFR), from 1980 to 2020.The study utilises the autoregressive distributed lag (ARDL) bounds testing approach for cointegration, and the nonlinear autoregressive distributed lag(NARDL)bounds testing approach. The cointegration analysis reveals a notable symmetric and asymmetric cointegrating relationship, both in the long run, between public expenditure (both external and domestic) and the chosen macroeconomic variables. In addition, the ARDL model demonstrates that Domestic Debt (DD) raises national output but reduces UNEMand INFRs significantly in the long term. However, the results suggest that External Debt (ED) raises UNEMand INTR in the country in the long term. The NARDL model indicates that the positive component of DD raises national output. The study reveals that both domestic and ED have long-term effects on national output, with negative debt reducing UNEMand INTR, and positive ED reducing inflation.Given these results, the federal government should decrease excessive borrowings due to their detrimental impact on macroeconomic indicators in the short and long run. Generate more revenue through tax increment rather than borrowing, diversify the economy into areas like agriculture and mining rather than depending on oil and borrowing, and reduce the leakages (corruption) in the system through effective and efficient use of the anti-graft agencies in Nigeria.

Keywords: Public Debt, External Debt, Domestic Debt, Real Gross Domestic Product, Unemployment Rate, Interest Rate and Inflation Rate
JEL Classification: E61, E62

I. Introduction

The public debt problem is not peculiar to a particular country or region but a global issue. Its origin can be traced to the first era of financial globalization (1880–1913). During that time, the gold standard was associated with significant trade and capital flows from the private sector, which boosted economic growth and reduced government debt ratios. Then followed the World Wars and the Great Depression, and the debt started to rise in 1914, the year when the First World War started. This later escalated due to the War (1914–1918) and other financial crises in developed economies. As the debt decreased throughout the 1920s, two additional spikes were associated with the depression of the early 1930s and the Second World War (1941–1945). Advanced economies have been indebted to an unprecedented degree since 1946, dating back to the Great Depression of the 1930s, with many countries borrowing heavily to pay for the War's costs, the damaged countries'

rehabilitation, and to pursue development (Abbas et al., 2010). The trend of public debt is increasing, leading to global financial crises at different periods.

In the 1960s, when most African countries gained political independence, there were great expectations of reaching a good level of development. Many African countries borrowed and successfully expanded their basic infrastructure and social services in the quest for rapid economic development. The aim was to strengthen their economies, achieved within a decade (1960–1970) after their independence (Greene, 1989). However, most African economies stagnated and declined after the first decade of economic growth (Musa, Magaji, Abdulmaliq & Eke, 2022). Due to the colossal budget deficit of African countries due to the decline in growth and their vulnerability to external shocks, borrowing for the development and stabilization of the economy is necessary (Chukwuka & Mma, 2019). This borrowing began African countries' debt accumulation and was mainly external (Magaji, 2000).

According to Omotoye (2006), Nigeria is highly indebted compared to other countries in Sub-Saharan Africa and holds the highest debt among states in West Africa. The primary obstacle confronting numerous developing nations since the onset of the 21st Century is the extent of their national debt. Thirty (30) African countries received complete debt relief in 2006 through the Highly Indebted Poor Countries (HIPC) initiative, specifically targeting qualifying debt. Amidst the worldwide crisis of 2008, the imminent debt crisis in Africa is escalating with the region's increasing debt burden. In 2017, nineteen African countries surpassed the 60 percent debt-to-GDP barrier established by the African Monetary Co-operation Programme (AMCP) for developing economies.

Additionally, 24 countries went beyond the 55 percent debt-to-GDP ratio advised by the International Monetary Fund(IMF), World Bank(WB), and World Development Indicators(WDI) in the same year (WB and WDI, 2018). Another threshold and benchmark the IMF sets is the debt service-to-revenue of not more than 22.5 percent, where most African countries default. For instance, Nigeria's debt servicing to revenue ratio has gone ballistic from 17 percent to 81 percent between December 2012 and December 2020, respectively. In 2012 and 2013, the Nigerian debt-servicing to Revenue ratio was 17 percent and 23 percent, respectively. However, from 2014 to 2020, Nigeria defaulted on the benchmark set by the IMF.

Accordingly, Nigeria's debt stock increased by 96.8 percent from ₦69,891 million in 1986 to ₦137,578 million in 1987. ED increased 307 percent from ₦633,017 million in 1998 to ₦2,577,374.40 million in 1999. On the other hand, DD increased by 47.9 percent during the same period, from ₦537,491 million to ₦794,807 million. By the end of 2004, the overall debt amount had increased to ₦6.261 Trillion, with around 78 percent being ED and the remaining 22 percent being DD (Ebi & Imoke, 2017). Debt reduction can enhance economic efficiency in a country with a debt overhang, as Ekperiware and Oladeji (2012) stated. Before debt relief, Nigeria's status was tenuous. Her debt management posed a distinct challenge, let alone utilising the debt for advancement. Bakare (2010) states that Nigeria experienced peak debt difficulty in 2003 when it had to allocate a maximum of $2.3 billion to repay its debt.

As a result of the introduction of Phase I and II of the Paris Club debt reduction, the overall amount of debt decreased by 64.8 percent from N6.260 trillion to N2.204 trillion between 2005 and 2006 (DMO, 2012). In 2006, implementing debt relief measures reduced ED to N451.46 billion, accounting for approximately 20 percent of the overall debt. The nation's debt portfolio, which had been diminished to ₦2.204 trillion in 2006, significantly increased to ₦12.60 trillion in the second quarter of 2015. In 2016, the overall debt increased to N17.36 trillion from N12.60 trillion in 2015, indicating a rise of N4.76 trillion or a 37.74 percent increase in naira value. The increase resulted from additional issuance to support the 2016 budget deficit and the devaluation of the naira versus the dollar owing to the liberalization of the exchange rate system (Musa & Ismail, 2023). The ED accounted for N3.48 trillion, equivalent to 20.04 percent, but the DD amounted to N13.88 trillion, representing 79.96 percent (DMO, 2016).

The escalating debt burden of Nigeria after the debt relief granted in 2006 is currently the focal point of policymakers and economic analysts. Given the decrease in oil prices and Nigeria's dependence on foreign earnings from oil and gas exports, borrowing is unavoidable to cope with the decline in revenue. Borrowing aims to achieve macroeconomic objectives, one of which is sustainable economic growth and development, particularly in Less Developed Countries (LDCs) (El-Yaqub, Musa & Magaji 2024). Therefore, public borrowing by sovereign Governments for economic growth and development or a transitory balance of payment deficit is desirable. In recent

times, public debts have increased sharply from N21.73 trillion in 2017 to ₦24.39 trillion in 2018, and from ₦24.39 trillion in 2018 to N27.40 trillion in 2019, and as of the end of the year 2020, the total debt stock is N32.92 trillion (DMO, 2017, 2018, 2019 & 2020), and is still on the increase. However, essential and basic infrastructures remain in a poor state in Nigeria (Magaji & Musa, 2015). However, economists and public analysts hold contrasting opinions regarding the relationship between public debt and economic performance. This study aimed to determine the influence of public debt on specific macroeconomic indicators, including RGDP, UNEMrate, INTR, and INFR.

II. Theoretical Background

2.1 Conceptual Review

2.1.1 The Concept of Public Debt

Public debt, as Aybarc (2019) defines it, refers to the lawful responsibility of the government to repay the principal amount and interest to individuals or entities with specific rights within a designated period. Public debt is the total financial obligations a government has accumulated by borrowing from its population, foreign governments, or international institutions. According to Chen (2018), debt is obtaining funds from a separate entity through borrowing. Various countries, organisations, and people employ it to ease the purchase of costly products that would otherwise be outside their financial means. As Idenyi, Igberi, & Anoke (2016) stated, public or national debt refers to the total amount of money borrowed by the government, encompassing federal, State, and municipal borrowings. Public debt refers to the aggregate amount of money that a country's government organisations have borrowed. This includes liabilities owed to private institutions, governmental bodies, foreign nations, and other entities. According to Idenyi, Igberi, & Anoke (2016), public debt refers to future pension obligations, government liabilities, and goods and services acquired by the government using credit.

Veiga, Ferreira-Lopes, & Sequeira (2014) define public debt as the State's financial liabilities towards external parties. When a transaction is conducted within the domestic market, it is considered internal. Conversely, if the transaction involves selling to the international market, it is considered external. This classification is independent of the currency and nationality of the creditors. The word denotes the sum of money the government has borrowed, encompassing domestic and foreign debt, which is utilised to finance its expenditures. Public debt is the total amount of money or resources borrowed from international and domestic sources.

2.1.2 Macroeconomic Performance

Macroeconomic performance pertains to evaluating a country's progress in achieving the primary goals of government policy. The primary objective of these policies typically revolves around enhancing the quality of life for their population. It centres on the overall economic changes, including factors like unemployment, INTR, GDP, inflation, and other related aspects. This analysis encompasses all macroeconomic and microeconomic parameters that influence economic performance. In Rafindadi's (2012) definition, macroeconomic performance refers to the capacity of a country's macroeconomic policymakers to deliver services that facilitate the achievement of specific living standards. In other words, the capacity of a nation's macroeconomic policymakers to deliver services to its citizens, such as a substantial real GDP per capita, minimal inflation, low unemployment, and a favourable trade surplus.

The terms development and growth were used synonymously. Khramov & Lee (2013) found that in the 1950s and 1960s, several emerging countries achieved their economic growth goals. However, the population's living conditions did not improve, leading to persistent poverty, illiteracy, and declining health in these nations. For example, in 2010, Nigeria's GDP was recalculated, resulting in Nigeria becoming the largest economy in Africa. However, this achievement persisted despite inflation, poverty, unemployment, inadequate infrastructure, and substandard health facilities. They mentioned that more than just referencing the GDP growth rate is needed to ensure economic development. Economic development is a complex topic that a single suitable definition cannot define due to its multiple factors and variables.

2.3 Theoretical Review

Various theories have been put up to elucidate the concept of public debt and its impact on macroeconomic performance. Hence, this analysis is grounded in the Keynesian theory of public debt.

2.3.1 Keynesian Theory of Public Debt

The Keynesian theory is associated with the concepts proposed by John Maynard Keynes (1936), as well as his contemporaries and subsequent scholars such as Hansen (1932), Hicks (1937), Samuelson (1948), and others. According to his perspective on the economic consequences of public debt, public borrowing does not have a

detrimental impact on the economy as proposed by the classical theory but rather contributes to the efficient operation of the economy. The perspective above was initially expounded upon in Keynes's seminal work, "The General Theory of Employment, Interest, and Money," released in 1936.

The theory, formulated as a response to the financial crisis triggered by the Great Depression in the 1930s, posited that the economy could reach a balance even with less than complete employment. It further argued that this equilibrium would not naturally correct itself, as the principle of effective demand determines production and employment levels. According to Hoogduin & Wierts (2012), the economy can return to full employment by utilising effective demand, even if it is currently in a state of equilibrium with unemployment. Keynes assumed that if the private sector was not using specific resources, an imbalanced budget could be used to use those resources.

Keynes (1936) posited that an augmentation in public debt would lead to an elevation in National Income because of many variables. He associated public borrowing with deficit financing and advocated for the government to borrow for all purposes, stimulating effective economic demand and increasing employment and output. In contrast to the classical approach, he must differentiate between productive and unproductive expenditure. In his 1936 paper, Keynes contended that borrowing for consumption holds equal importance to borrowing for Investment in the productive sector. This occurs because consumer spending spurs a rise in Investment. According to Filip (2010), the Keynesian theory posits that expanding public debt increases private consumption and impacts other macroeconomic factors such as output and unemployment. To support this perspective, it is essential to note that the amount of public debt directly impacts government expenditure.

Additionally, public goods can improve individuals' quality of life by contributing value and promoting economic growth and advancement. Matthew& Mordecai (2016) argue that public borrowing can significantly impact a country's economic performance, providing an alternative. The relationship between the increase in debt and the ability to repay that debt impacts the amount of resources that may be allocated toward Investment. According to Keynesian theory, capital accumulation stimulates economic growth by promoting ED and injecting cash to stimulate economic activity.

Furthermore, Precious (2015) asserts that a substantial amount of public debt is considered a valuable national resource rather than a burden. Therefore, persistent deficit spending is crucial for the economic expansion of nations since it results in achieving full employment. Keynesians supported using borrowed money for government spending, asserting that public debt can help create jobs during unemployment. Keynes (1936) argues that public debt is a crucial fiscal tool during economic recessions. This is because recessions are characterised by low Investment, increasing unemployment, and sluggish economic development resulting from a lack of aggregate demand. He asserts that fiscal policy, when it serves the collective welfare, is the most effective strategy for fostering economic growth and development in every economy.

Developing countries embraced this argument as a justification for their underdevelopment. Nevertheless, a notable drawback of this hypothesis is the potential for government failure in effectively providing or distributing public debt advantages.

2.4 Empirical Review

Benjamin, Alexander, & Godswill (2020) study the dynamic relationships between ED and economic growth in 43 African states. They applied the Johansen Cointegration test and the system Generalised Method of Moments (sysGMM) from 2001 to 2018. In addition, they employed data offered by the WDIs (WDI). The utilised variables cover RGDP (RGDP) and public ED, with trade openness, INTR, INFR, government investment, population growth, and human capital development as control factors. Their purpose was to analyse the worldwide influence of external variables, notably debt, on the economic advancement of those countries. Their findings indicated a stable and persistent connection between ED and African economic growth. The data also suggested that once a specified capacity is reached, the short-term scenario progressively shifts towards equilibrium in the long term, and the buildup of ED begins to affect economic growth in Africa negatively. They encouraged policymakers to ensure the proper allocation of ED towards economic activities that would result in steady and enduring long-term economic growth. In addition, the government and development partners must build a monitoring framework to ensure the effective and efficient utilisation of the borrowed resources. While this study applied the Johansen Cointegration Test with

a focus on RGDP and public ED variables, it did not include internal debt as a component.

However, Iwedi (2020) also studies the influence of public debt on the INFR from 1960 to 2016. The researcher employed secondary data from the CBN and DMO Bulletins, yearly reports, and account statements. The INFR was considered the dependent variable. In contrast, short-term DD, long-term DD, money supply growth, and GDP growth rate were considered independent factors. The applied analytical technique was Pairwise Granger Causality analysis. His research found that DD in Nigeria is a direct cause of inflation. DD has a direct influence on the general price level of the economy. A study by Akingbade & Nicholas (2020) in Ghana examined the association between state debt and inflation. They examined yearly time series data from 1983 to 2018 to provide valuable insights into the issue. The INFR was used as the dependent variable, while governmental debt, money supply, INTR, economic growth, and private Investment were included as independent variables. This study exclusively employed inflation as the dependent variable.

Jude (2020) explores the repercussions of rising UNEMin Nigeria and raises the inquiry: Can Public Debt have advantageous effects? The investigation will encompass the period from 1981 to 2019, utilising the VECM approach. The study used UNEMas the dependent variable and considered ED outstanding, government total debt stock, total debt servicing, and government expenditure as independent variables. The results suggest that public debt needs to alleviate UNEMin Nigeria effectively. He emphasised the importance of efficiently tackling corruption to utilize borrowed monies for essential infrastructure projects. This is of utmost importance as an excessive amount of public debt has the potential to impact the economy negatively. In the end, it is essential to forbid borrowing for excessive consumption. This study utilised the Vector Error Correction Model (VECM) methodology, with UNEMas the only dependent variable.

Essien, Ngozi, Agboegbulem, Mba, & Onumonu (2016) examine the impact of public sector borrowing on prices, INTR, and output in Nigeria from 1970 to 2014. The analysis employed the following variables: RGDP (RGDP), prime lending rate (LR), composite consumer price index (CPI), overseas debt stock (XD), and DD stock (DD). The study utilises the Vector Autoregressive (VAR) framework, the Granger causality test, impulse response analysis, and variance decomposition to examine the connections between variables. Their research revealed that a quick surge in foreign debt stock results in a subsequent elevation in the prime lending rate, albeit with a time lag. Nevertheless, neither external nor DD impacted the overall price level and output in the long run.

In contrast, inflation showed a favourable reaction to ED shocks and an unfavourable reaction to DD shocks. They suggested employing government borrowing for crucial infrastructure and goods to foster economic growth instead of using it for recurrent expenses that may result in inflation. This study focused exclusively on borrowing within the public sector, limiting its analysis to data from 1970 to 2014. The study utilised the VAR approach.

Dikeogu (2018) did a distinct analysis that investigates the relationship between government expenditure and inflation in Nigeria from 1980 to 2017. The Auto-Regressive Distributed Lag (ARDL) technique was utilised to analyse the relationship between public expenditure and inflation in Nigeria. The INFR was the dependent variable, whereas public capital expenditure and recurrent spending were the main explanatory variables. In addition, the elements of money supply and exchange rate were included for examination. The results suggested that the government's capital and recurrent expenditures have a negligible and non-significant effect on inflation. This study exclusively investigated the association between government expenditure and inflation.

James, Magaji, Ayo, & Musa (2016) examine the impact of DD on economic performance in Nigeria between 1970 and 2013, employing the ordinary least square methodology. The data utilised in this investigation was acquired from secondary sources. The study's findings suggest that DD has a statistically insignificant but negative impact on economic growth in Nigeria. Moreover, it has been seen that DD hurts unemployment. The results also demonstrated a clear and direct relationship between Nigeria's DD and its INFR throughout the study. Therefore, the study suggests adopting effective methods to ensure that borrowed monies are used wisely for economic advancement. This study investigated the impact of exclusively DD on economic performance without considering any ED.

Therefore, it is imperative to investigate the collective impact of domestic and foreign debts on Nigeria's crucial macroeconomic variables (such as RGDP, unemployment, inflation, and INTR). This study aims to achieve this purpose.

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

III. Methodology

3.1 Research Design

This study employed an analytical and descriptive research design to investigate the correlations between public debt and macroeconomic performance factors. The study utilised the Linear ARDL model and the Nonlinear NARDLmodel. The ARDL model is a dependable technique for detecting cointegrating correlations in limited datasets, irrespective of the integration order of the regressors. The NARDL model, an extension of ARDL, is employed to investigate an asymmetrical association between the dependent and explanatory variables. The NARDL model utilises partial sum decompositions to establish long-term and short-term links.

3.2 Model Specification

The Keynesian theory of public debt is based on effective demand. That is demand back-up by the ability to pay. Aggregate demand equates to aggregate supply (public debt assumed full employment). According to Keynes, government expenditure is essential to raise aggregate demand, leading to economic performance, especially in UNEand under-employment. The Keynesian model of aggregate demand (Y) is determined by consumption (C), Investment (I), and government expenditure (G) (Keynes, 1935). When a closed economy is assumed, the equilibrium equation for Y is:

$$Y = C + I + G \quad \ldots\ldots (3.1)$$

Model one:

$$RGDP = \lambda_0 ED^{\lambda 1} DD^{\lambda 2} \quad \ldots\ldots (3.4)$$

Model one examines the impact of public debts on the economic growth in Nigeria.

Model Two:

$$UNEM = \alpha_0 ED^{\alpha 1} DD^{\alpha 2} \quad \ldots\ldots (3.5)$$

Model two examines the impact of public debts on the UNEMrate in Nigeria.

Model Three:

$$INTR = \beta_0 ED^{\beta 1} DD^{\beta 2} \quad \ldots\ldots (3.6)$$

Model Three examines the impact of public debts on INTR in Nigeria.

The G in the above equation represents autonomous government expenditure and can be financed by borrowing domestically from the public at the nominal INTR.

The equation can be expanded when the government transacts business outside its economy. That is when the external sector is introduced. The positive or negative net exports are the difference between exports and imports (X – M). Where X is the export while M is the import and can be added to equation 3.1 as follows:

$$Y = C + I + G + (X - M) \quad \ldots\ldots (3.2)$$

To achieve the objectives of this study, a modified version of Didia and Ayokunle's (2020) model that examined the relationship between Nigeria's public debt and GDP was used. Their model is as follows:

$$GDP = f(DD, ED, V') \quad \ldots\ldots (3.3)$$

Where:

GDP = Gross Domestic Product.
DD = Total Domestic Debt as a percentage of GDP
ED = Total External Debt as a percentage of GDP
V' = additional factors that affect GDP, like foreign aid, foreign direct Investment, government spending, export revenue, and debt services.

However, four functional forms of the models were created from equation (3.3) to the goals of this study:

Model Four:

$$INFR = \phi_0 ED^{\phi 1} DD^{\phi 2} \quad \ldots\ldots (3.7)$$

Model four examines the impact of public debts on inflation in Nigeria.

Where:

RGDP = Real Gross Domestic Product
ED = External Debt
DD = Domestic Debt
UNEM = UnemploymentRate
INTR = Rate of Interest
INFR = INFR
U_t = Stochastic or Error Term

The apriori expectation is that: $\lambda_1 <$ or > 0, $\lambda_2 > 0$; $\alpha 1 <$ or > 0, $\alpha_2 > 0$; $\beta_1 > 0$, $\beta_2 > 0$
While $\phi_1 <$ or > 0, $\phi_2 > 0$

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

3.3 Techniques of Data Analysis

This study used the techniques of estimation, stationarity test, a test of heteroskedasticity, serial correlation, normal distribution, and cointegration to analyze the data.

3.4 Nature and Sources of Data

The study uses yearly time series data sets from 1980 to 2020, comprising 41 observations. The data set was obtained from reliable secondary sources, such as the Central Bank of Nigeria's (CBN) annual statistical bulletin, the Debt Management Office's (DMO) annual reports, the National Bureau of Statistics (NBS), the WB, the IMF, and the WDI (WDI). More precisely, the information on RGDP and INTR was obtained from the CBN bulletin. Moreover, the UNEMand INFR data were obtained from the NBS and the IMF publications. Finally, the Debt Management Office and World Bank were responsible for collecting both internal and EDs.

IV. Empirical Findings/Results

4.1 Data Presentation

The ARDLbounds testing method is used to evaluate the presence of cointegration through nonlinear analysis. The study employed the NARDLbounds testing approach to analyse the impact of public debt on various macroeconomic indicators (RGDP, unemployment, INTR, and INFR) in Nigeria. Following that, the hypotheses stated in the previous part are analysed, taking into account the projected result.

4.2 Data Analysis

4.2.1 Statistical Analysis (Descriptive Statistics)

Descriptive statistics examines the variables' statistical properties, such as mean, maximum, minimum, and standard deviation. It also looks at the variables' distribution pattern to identify whether they are typically distributed.

Table 4.2.1: Descriptive Statistics

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jaque Bera	Max.	Min.
LRGDP	14.851	2.646	-0.294	1.651	3.702	18.190	10.700
UNEM	17.640	6.276	-0.345	4.098	2.873	33.300	0.000
INTR	21.936	6.440	-0.168	2.602	0.464	36.090	9.000
INFO	18.659	16.004	1.825	5.568	34.039	72.800	5.400
LDD	13.360	2.352	-0.244	1.889	2.519	16.820	9.020
LED	13.141	2.208	-0.961	3.298	6.457	16.360	7.530

Source: Author's computation extracted from E-views output (2023)

The descriptive statistics for the variables log of DD (LDD), log of foreign debt (LED), log of RGDP, UNEM rate, INTR, and INFR are presented in Table 4.2.1. The results suggest that the average logarithmic value of RGDP is 14.85. In contrast, the average unemployment, interest, and INFRs are 17.64%, 21.94%, and 18.66%, respectively. Furthermore, the findings suggest that the deviation of the variables from their average value is relatively minimal. The standard deviation of the RGDP log is 2.65. The standard deviations of the unemployment, interest, and INFRs are 6.28, 6.44, and 16.004, respectively. The analysis shows that the standard deviation of the logarithm of DD is 2.35, whereas the standard deviation of the logarithm of overseas debt is 2.21.

In addition, the skewness properties indicate the degree of distortion or asymmetry in the series distribution relative to its mean. It also reveals how much the distribution stretches towards the right or left tail. In this case, the INFR is right-skewed, as indicated by the positive value of the skewness properties. On the other hand, the other variables have a left-skewed distribution, indicating that their series has a longer right tail. Furthermore, this suggests that the variables' distribution is asymmetrical. In addition, the kurtosis characteristics of the series, which measure the degree of peakedness or flatness in the distribution of the series, indicate that all the variables deviated from a normal distribution due to dispersion away from their mean value. Specifically, the kurtosis qualities suggest that the logarithm of GDP, INTR, and the logarithm of DD exhibit a flat distribution rather than a bell-shaped distribution, typically associated with a normal distribution. On the other hand, the distribution of unemployment, INFR, and the logarithm of ED implies a peaked shape in the series.

More so, based on the Jarque-Bera property, the results suggest that all the series, aside from the log of ED and INFR, are insignificant, thus indicating that the variables are not normally distributed.

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

4.2.2 Trend Analysis of the Variables

Having explored the summary statistics of the variables considered, the graphical representation of the movement of the variables, especially the relationship between the variables and domestic and EDs.

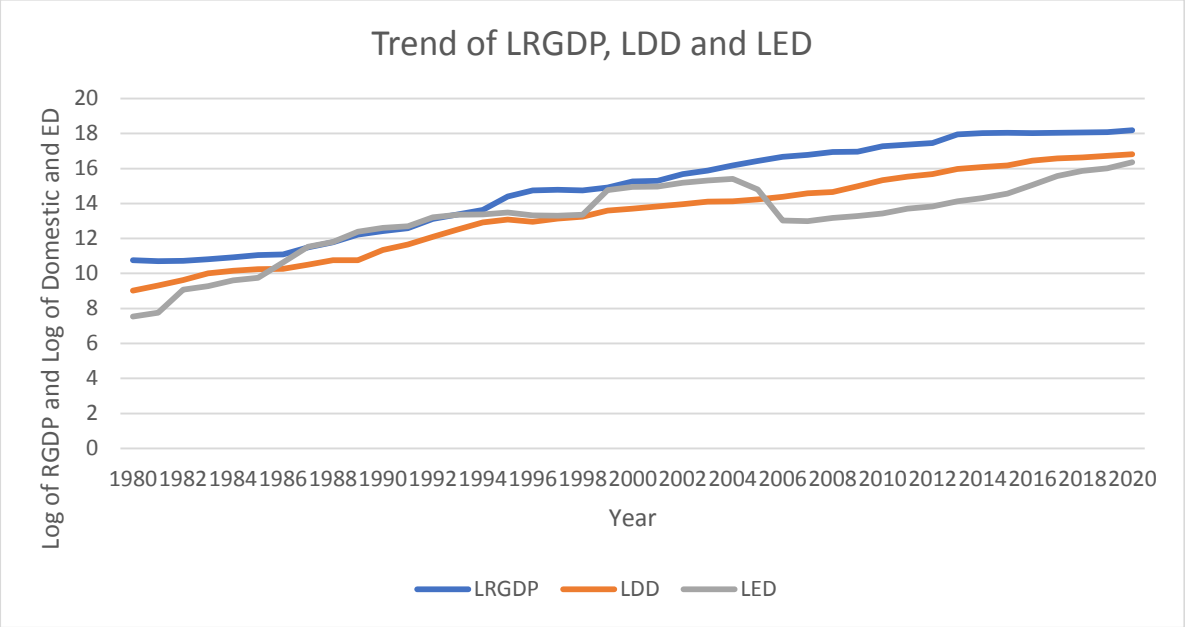

Figure 4.1: Trend of RGDP, LDD, and LED over 41 years in Nigeria
Source: Author's computation extracted from Excel output (2023)

The graphical depiction of the relationship between RGDP and public debt (external and DD) is presented in Figure 4.1. The trend suggests that the log GDP and the log of public debt (external and DD) co-move from the graphical illustration. For instance, between 1980 and 2006, Figure 4.1 indicates that public debt and GDP steadily rose. Though ED assumed a declining trend following the cancellation of Nigerian EDs, public debt, and RGDP continued to rise, especially from 2014 through 2020.

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

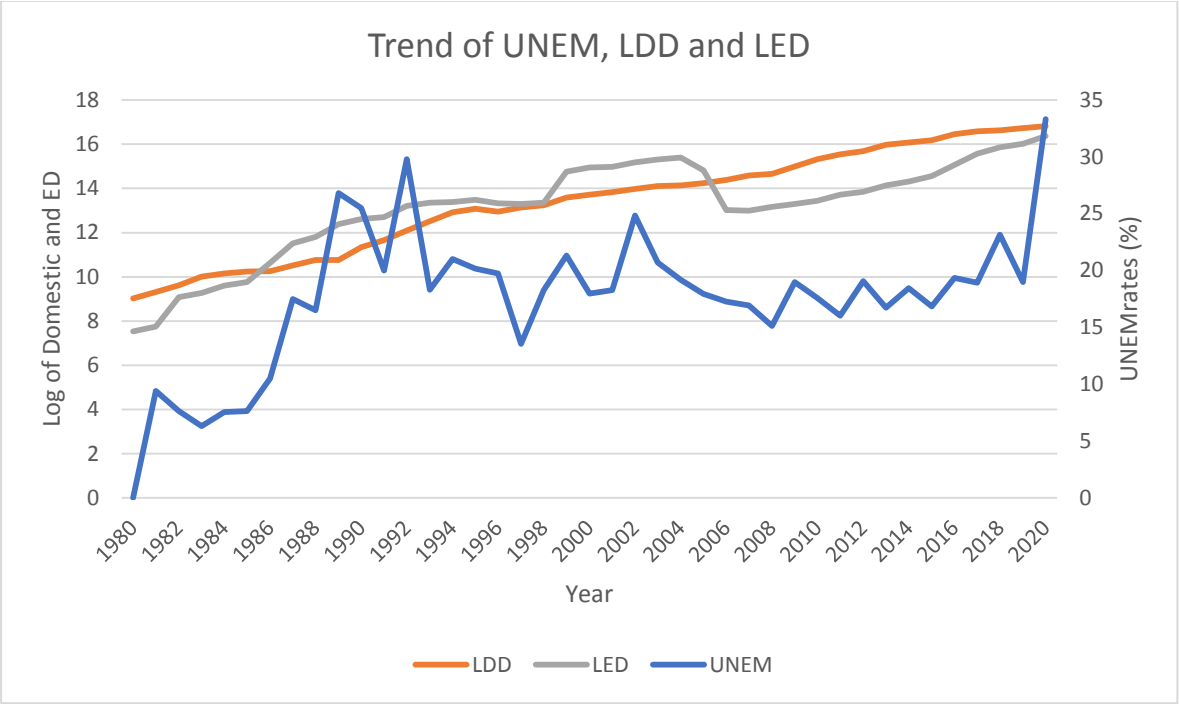

Figure 4.2: Trend of UNEM, LDD, and LED over 41 years in Nigeria
Author's computation extracted from Excel output (2023)

With regards to the correlation between the UNEMrate and the logs of public debt (log of DD and log of ED), the trend indicates that while public debt (both external and DD) demonstrates a rising trend, UNEMhas been fluctuating over time, rising sometimes and declining in other periods. Nonetheless, following the decline in public debt (ED) in 2006, UNEMsignificantly dropped from 24.85 percent in 2002 to 17.26 percent in 2006, and further to 16.94 percent in 2007 and 15.14 percent in 2008. Unfortunately, despite the country's rising trend of public debt, the UNEMrate was 33.3 percent.

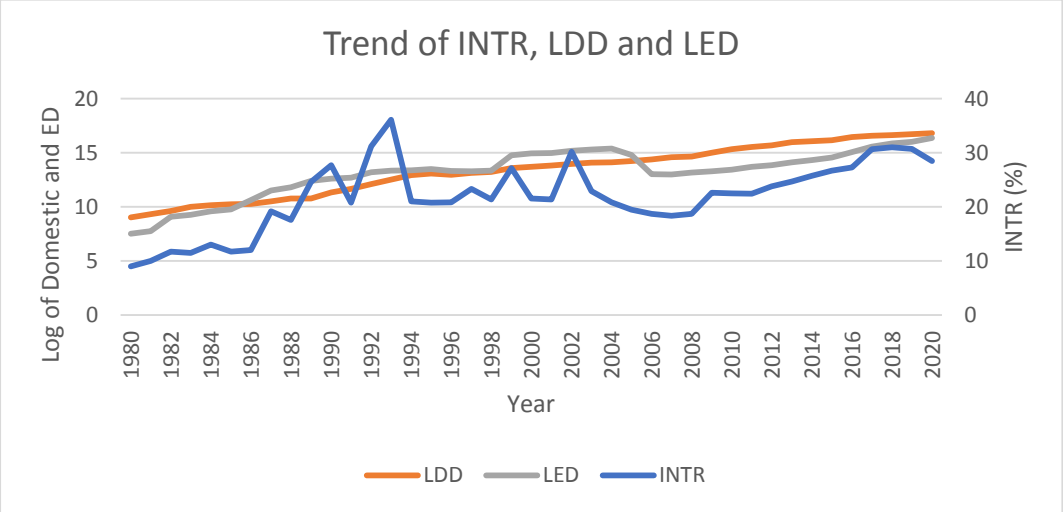

Figure 4.3: Trend of INTR, LDD, and LED over 41 years in Nigeria
Author's computation extracted from Excel output (2023)

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

In addition, the trend of public expenditure (log of ED and log of DD) and INTR suggest an erratic movement in INTR despite the seemingly steady increase in public expenditure. However, both series assumed a similar movement. For instance, in most periods between 1989 and 1991 and from 1999 to 2008, the rise and fall in INTR are followed by an increase and decline in the log of public expenditure (domestic and external public debt). However, whereas the INTR declined from 30.72 percent in 2019 to 28.48 percent in 2020, public expenditure rose during the same period.

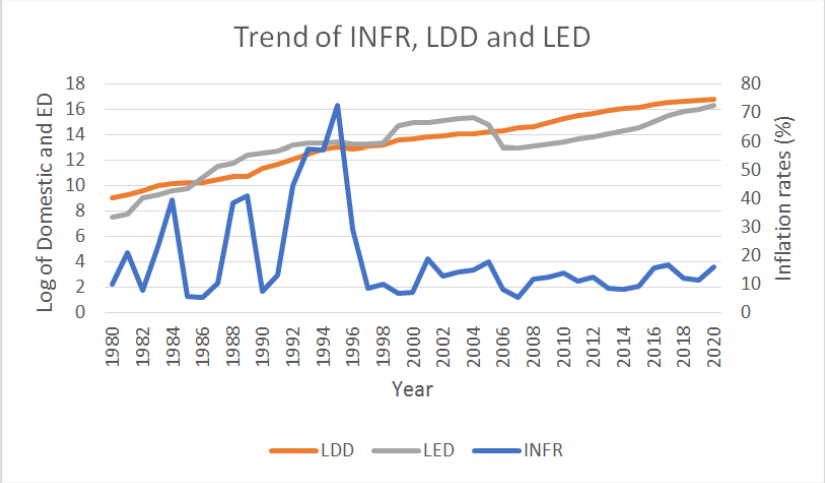

Figure 4.4: Trend of INFR, LDD, and LED over 41 years in Nigeria
Author's computation extracted from Excel output (2023)

In terms of the INFR and the log of public debt (external and DD), the graphical depiction suggests that there is a proportionate relationship between inflation and national debt in Nigeria. An increase in the general price level often accompanies a rise in public debt (external and DD).

4.2.3 Unit Root Test

After analysing the pattern and behaviour of the variables, the stationary characteristics of the series are taken into account prior to model estimation. This guarantees the inclusion of non-stationary series in the estimation, producing a false regression estimation outcome. In addition, as the ARDLbounds testing approach to cointegration and the NARDL techniques necessitate the regressors to have an integration order no higher than 1, it was only logical to perform unit root tests on the variables. In order to achieve this objective, the Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests are utilised. The ADF and PP unit roots test results are displayed in Table 4.2.2. The findings indicate that the logarithm of RGDP, unemployment, interest, and INFRs are stationary at this level. Regarding the log of external and DD, the unit root tests demonstrate that both series become stationary after being differenced once. This implies that estimates using variables at the same level will not conform to the standard distribution, and the problem of false regression is possible.

Table 4.2.2: Unit Root Tests Result

Variables	ADF			PP		
	Level	1st Diff.	Conclusion	Level	1st Diff.	Conclusion
LRGDP	3.199**	5.022**	I(0)	3.283**	5.043***	I(0)
UNEM	3.020**	3.262**	I(0)	3.024**	9.513**	I(0)
INTR	2.711*	7.013***	I(0)	2.579*	8.163***	I(0)
INFO	3.389**	6.129***	I(0)	3.091**	12.266***	I(0)
LDD	1.963	4.826***	I(1)	1.772	4.805***	I(1)
LED	2.482	4.461***	I(1)	2.389	4.461***	I(1)

Note: **** indicates significance at 1% level; ** significance at 5% level and * significance at 10% level*
Source: Author's computation extracted from E-views (2023)

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

Based on the unit root test outcomes, it is apparent that the variables fulfill the preconditions for adopting the ARDL and NARDL bounds testing approach to cointegration techniques. Therefore, the bounds testing approach within the ARDL and NARDL models can then be implemented, after which the ARDL and NARDL models are estimated.

4.2.4 Asymmetric Relationship Test

Before conducting limits testing and estimating the ARDL and NARDL models, the asymmetrical relationship between the variables is assessed using the Wald test. This is done to observe an asymmetrical relationship between the variables over an extended or brief period. The outcome of the unbalanced relationship is displayed in Table 4.2.3.

Table 4.2.3: Wald Test for Asymmetric Result

Model	Variables	Long – term		Short – term	
		T-Stat.	**F-Stat.**	**T-Stat.**	**F-Stat.**
1	**LDD & LED ± LRGDP**	12.838***	164.818***	12.838***	164.818***
2	**LDD & LED ± UNEM**	3.519**	3.308**	3.519**	2.308*
3	**LDD & LED ± INTR**	3.185***	10.144***	3.185***	10.144***
4	**LDD & LED ± INFR**	4.412***	4.169***	4.412***	4.169**

Source: Author's computation extracted from E-views Output (2023)

The results of the asymmetric relationship between the variables are recorded in Table 4.2.3. The Wald test results demonstrate a strong and statistically significant asymmetry association between the short-term and long-term variables. The findings demonstrate a notable and unequal correlation between public debt (both foreign and domestic) and the selected macroeconomic indicators (RGDP, unemployment, INTR, and inflation) at a statistically significant threshold of 1%, 5%, or 10%.

4.2.5 Results of ARDL Bound Testing approach to cointegration

Once the asymmetrical link between the variables has been determined, the existence or absence of cointegrating relationships can be determined using the limits testing approach within the ARDL and NARDL framework. The ARDL bounds testing results, as shown in Table 4.2.4, indicate the existence of a cointegrating (long-run) connection between RGDP and foreign and domestic public debt, unemployment, and public debt, as well as inflation and public debt. Nevertheless, the available evidence is inadequate to dismiss the null hypothesis that no cointegrating (long-run) link exists between INTR and public debt.

The findings provide sufficient evidence to reject the null hypothesis that no cointegration exists between all variables. This was tested using the limitations (Bound test) approach within the NARDL framework. Therefore, this demonstrates the symmetric and asymmetric connection between public debt and the chosen macroeconomic factors in the nation.

Table 4.2.4: ARDL and NARDL Bounds Testing Result

Model	**Dependent Variable(s)**	**Regressors**	**Symmetric (Linear)**	**Asymmetric (Nonlinear)**
1	**LRGDP**	LDD, LED	14.997***	4.496***
2	**UNEM**	LDD, LED	4.341**	12.814***
3	**INTR**	LDD, LED	2.486	9.362***
4	**INFR**	LDD, LED	6.904***	4.637***

Source: Author's computation extracted from Stata Output (2023)

4.2.6 Results of Residual Diagnostics

Table 4.2.5 displays the residual diagnostic outcomes for the Ordinary Least Squares (OLS) models' assumption. The study results are deemed reliable based on the residual diagnostic, which indicates that the residuals of our calculations follow a normal distribution and do not exhibit autocorrelation or heteroskedasticity issues. The test

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

generally does not disprove the null hypotheses of non-normality, hence the absence of autocorrelation and homoscedasticity.

Table 4.2.5: Residual Diagnostic Test Result

Model	Normal Distribution	Serial Correlation	Heteroskedasticity
1	0.991	0.538	0.773
2	0.867	0.921	0.123
3	0.689	0.572	0.860
4	0.401	0.483	0.731

Source: Author's computation extracted from E-views output (2023)

4.2.7 Results of Model Stability

Table 4.2.6 displays the outcomes of the Ramsey RESET, CUSUM, and CUSUMQ tests. The Ramsey RESET test yielded a probability value of over 5 percent. This suggests that the model is well-specified, except for model 1, which exhibits a specification error. The stability of CUSUM and CUSUMQ is ensured as the probability value falls below the specified 5 percent threshold. The value is 0.05. Given these results, the policy advice derived from this study is justified.

Table 4.2.6: Stability Diagnostic Test Result

Model	Ramsey RESET	CUSTOM	CUSUMQ
1	0.039**	Stable	Stable
2	0.359	Stable	Stable
3	0.171	Stable	Stable
4	0.231	Stable	Stable

Source: Author's computation extracted from E-views output (2023)

4.3 Interpretation and Discussion of Results

Acquiring public debt aims to harness resources to finance the budget deficit and improve economic growth and development. However, further borrowing may endanger growth and development when debt reaches certain thresholds. The study examines the effects of public debt (LDD and LED) on national output, unemployment, INTR, and consumer price index (INFR) in Nigeria using Linear ARDLand Nonlinear NARDLmodels.

4.3.1 The Impact of Public Debt on National Output in Nigeria

The study's primary purpose is to examine the influence of public debt on the national output in Nigeria. The findings are displayed in the second column of Table 4.3.1.

Table 4.3.1: ARDL/NARDL Regression result

PANEL A (long-run and short-run ARDL results)				
Variables	$LRGDP$	$UNEM$	$INTR$	$INFO$
LDD	0.801***	-1.620**	0.008	-4.349*
LED	0.317	3.726***	2.564**	4.949
ΔLDD	-	5.781**	11.560***	4.601
$\Delta LDD(1)$	-	-	-	48.834***
ΔLED	-0.041	-	4.695***	-
ECT_{t-1}	-0.160***	-0.801***	-0.583***	-0.619***
R^2	0.287	0.482	0.573	0.553
$D-W$	1.881	1.679	1.972	1.812

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

PANEL B (long-run and short-run NARDL results)				
LDD^{+}	0.803***	-7.312***	-1.009	3.869
LDD^{-}	-7.864***	1.261***	4.737***	6.307
LED^{+}	0.034	7.994***	4.648***	-4.381*
LED^{-}	-0.177**	0.774*	2.442***	-1.976
ΔLDD^{+}	0.088	4.521*	6.485**	-9.577
ΔLDD^{-}	-2.321*	-5.159**	4.714**	6.081***
$\Delta LDD^{+}(1)$	-	-	14.179***	25.286***
$\Delta LDD^{-}(1)$	5.123***	-4.418**	-10.847***	5.797**
ΔLED^{+}	-	9.449***	12.026***	27.915***
ΔLED^{-}	-	-	3.561***	7.642**
$\Delta LED^{+}(1)$	-	-3.516***	-1.706	-20.630***
$\Delta LED^{-}(1)$	-	-	-2.210**	-
ECT_{t-1}	-0.741***	-0.528***	-0.847***	-0.348**
R^2	0.534	0.879	0.938	0.917
$D-W$	2.048	1.868	1.634	1.816

Notes: The estimation results for the long-term and short-term effects of the ARDL and NARDL models are presented in Panels A and B, respectively. The sign Δ denotes the operator referred to as the first difference. The asterisk symbols (*), (**), and (***) represent statistical significance at the 1 percent, 5 percent, and 1 percent levels, correspondingly. The superscripts "+" and "−" denote the positive and negative partial sums, respectively. The variable ECT_(t-1) denotes the value of the error correction term's coefficient in the preceding period. The abbreviation D-W stands for the Durbin-Watson statistic.
Source: Author's computation extracted from E-views output (2023)

The ARDLanalysis in Panel A demonstrated that the lagged dependent variable (LDD) had a positive and statistically significant effect on Nigeria's long-run GDP (LRGDP). An increase in the LDD by a certain percentage would result in a corresponding increase of 0.80 percent in the LRGDP. This aligns with the theoretical expectations of the model and supports previous findings by Didia and Ayokunle (2020), Ifeanyi and Umeh (2019), Sanusi et al. (2019), Isibor et al. (2018), and Abula and Ben (2019). The year is 2016. In the long run, the LED has a positive but statistically insignificant effect on the LRGDP. However, it has a negative and insignificant influence in the short run. A one percentage point rise in the LED would lead to a long-term gain of 0.32 percentage points in the LRGDP and a short-term drop of 0.04 percentage points in Nigeria. This is in direct opposition to the theoretical anticipation. Nevertheless, it aligns with the prior findings of Benjamin et al. (2020) and Tajudeen (2012).

Furthermore, panel B's asymmetric model indicates that the increase and decrease in LDD have a statistically significant positive and negative influence on the LRGDP in both the long-run and short-run, except for the short-run positive component. In Nigeria, a change in the LDD (Labour Demand and Development) would result in a corresponding rise or decrease in the LRGDP (Long-Run GDP). This change would amount to a 0.80 percent gain or a 7.86 percent decline in the long run and a 0.08 percent increase or a 2.32 percent decrease in the short run. According to the data, the negative factors of the LDD had a more significant influence on the LRGDP than the positive factors in both periods. Inferring that government policies to increase RGDP through DD are more conducive to increased national output than constraint. Likewise, the LED positive component inflates statistical insignificance, while the harmful component reveals a deflating statistically significant impact on Nigeria's LRGDP in the long run. A percent increase in the LED would bring about 0.03 percent appreciation and 0.18 percent depreciation in the LRGDP.

4.3.2 The Impact of Public Debt on Unemployment (UNEM)in Nigeria

The study's second goal is to analyze the impact of Nigeria's state debt on unemployment. The outcome of this study is presented in the third column of Table 4.3.2.

The UNEMand public debt results demonstrate that LDD has an inverse and statistically significant influence on UNEM in the long run and a positive statistical significance in the short run, as reported in panel A. This means that a percentage appreciation in the LDD would lead to

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

an average of 1.62 percent decrease in the UNEM rate in the long run and a 5.73 percent increase in the UNEM rate in Nigeria in the short run. The former contradicts the study's prior expectation, but similar findings were reported by Jude (2020), Ogonna et al. (2016), and Adams et al. (2016). They discovered that increasing domestic borrowing in Nigeria has a deteriorating effect on rising unemployment. DD in Nigeria has not contributed to reducing UNEMin any manner. The LED has a substantial and statistically significant influence on the UNEM. Specifically, a percentage rise in LED would result in a 3.73% enhancement in the UNEM rate in Nigeria during the study period. This indicates that the government's decision to increase ED has negatively impacted the UNEMrate in Nigeria. This is contrary to the anticipated outcome and may be attributed to the rampant corruption in the country, whereby a significant portion of the borrowed public monies is misappropriated for personal gain.

Table 4.3.2: ARDL/NARDL Regression Result

PANEL A (long-run and short-run ARDL results)				
Variables	$LRGDP$	$UNEM$	$INTR$	$INFO$
$\boldsymbol{LDD}$	0.801***	-1.620**	0.008	-4.349*
$\boldsymbol{LED}$	0.317	3.726***	2.564**	4.949
$\boldsymbol{\Delta LDD}$	-	5.781**	11.560***	4.601
$\boldsymbol{\Delta LDD(1)}$	-	-	-	48.834***
$\boldsymbol{\Delta LED}$	-0.041	-	4.695***	-
$\boldsymbol{ECT_{t-1}}$	-0.160***	-0.801***	-0.583***	-0.619***
$\boldsymbol{R^2}$	0.287	0.482	0.573	0.553
$\boldsymbol{D-W}$	1.881	1.679	1.972	1.812
PANEL B (long-run and short-run NARDL results)				
$\boldsymbol{LDD^+}$	0.803***	-7.312***	-1.009	3.869
$\boldsymbol{LDD^-}$	-7.864***	1.261***	4.737***	6.307
$\boldsymbol{LED^+}$	0.034	7.994***	4.648***	-4.381*
$\boldsymbol{LED^-}$	-0.177**	0.774*	2.442***	-1.976
$\boldsymbol{\Delta LDD^+}$	0.088	4.521*	6.485**	-9.577
$\boldsymbol{\Delta LDD^-}$	-2.321*	-5.159**	4.714**	6.081***
$\boldsymbol{\Delta LDD^+(1)}$	-	-	14.179***	25.286***
$\boldsymbol{\Delta LDD^-(1)}$	5.123***	-4.418**	-10.847***	5.797**
$\boldsymbol{\Delta LED^+}$	-	9.449***	12.026***	27.915***
$\boldsymbol{\Delta LED^-}$	-	-	3.561***	7.642**
$\boldsymbol{\Delta LED^+(1)}$	-	-3.516***	-1.706	-20.630***
$\boldsymbol{\Delta LED^-(1)}$	-	-	-2.210**	-
$\boldsymbol{ECT_{t-1}}$	-0.741***	-0.528***	-0.847***	-0.348**
$\boldsymbol{R^2}$	0.534	0.879	0.938	0.917
$\boldsymbol{D-W}$	2.048	1.868	1.634	1.816

Notes: The estimation results for the ARDL and NARDL models are provided in Panel A and B, respectively, including both long-run and short-run effects. The symbol Δ represents the operator known as the first difference. The asterisk symbols (*), (**), and (***) indicate statistical significance at the 1 percent, 5 percent, and 1 percent levels, respectively. The superscripts "+" and "–" indicate positive and negative partial sums, respectively. The variable ECT_(t-1) represents the coefficient of the error correction term from the previous period. D-W refers to Durbin-Watson, a statistical test used to detect autocorrelation in regression analysis.
Source: Author's computation extracted from E-views output (2023)

Moreover, the influence of the positive aspect of LDD on UNEM is statistically significant, both in the long term and in the short term. An increase in the LDD by a certain percentage would decrease the UNEM by 7.31 percent over a long period. This finding further substantiated the theoretical

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 3, May.-June, 2024, pp: 09-28 www.ijhssm.org

framework of the current investigation. Furthermore, the long-term effect of the adverse aspect of LDD on the UNEM is substantial. A decline in the LDD by a certain percentage would result in a corresponding INFR of 1.26 percent on the UNEM in Nigeria in the long term. The conclusion implies that DD significantly influences reducing unemployment, as its inflation has a more significant effect on the UNEM than the partial deflation total.

However, the positive component of the LED has a considerable and scientifically proven influence on the UNEM. A change in the LED would result in an average long-term appreciation of 7.99 percent and a depreciation of 0.77 percent in the UNEM rate. In the immediate term, the favourable aspect of the LED had a growing and statistically significant influence on the UNEM. A 9.45% rise in the LED would result in a corresponding 9.45% increase in the UNEM.

4.3.3 The Impact of Government Borrowing on the Interest Rate (INTR) in Nigeria

Furthermore, the study aims to analyse the influence of government borrowing on INTR in Nigeria. The regression outcome is displayed in the fourth column of Table 4.3.3.

In panel A, it was found that both in the long and short run, the LDD and LED have a beneficial influence on INTR. The effect of LED is statistically significant in both the long and short run. However, it is not significant for LDD in the long run. For example, a percentage increase in LDD would result in a 0.01% increase in the INTR rate in the long term and an 11.56% increase in the short term in Nigeria. This aligns with the anticipated outcome of the model and is corroborated by prior research conducted by Justus et al. (2018), Asma and Kashif (2017), Osuka and Achinihu (2014), Ebi et al. (2013), and Kolawale (2013).

Similarly, a proportional growth in the LED would increase the INTR by 2.56 percent in the long run and 4.70 percent in the short run. This is consistent with the anticipated outcome of the model and the prior research conducted by Idowu et al. (2018), Justus et al. (2018), Akinkunmi (2017), and Essien et al. (2016). Consequently, the INTR in Nigeria is adversely affected by the rise in both foreign and local borrowings.

Table 4.3.3: ARDL/NARDL Regression Result

PANEL A (long-run and short-run ARDL results)				
Variables	$LRGDP$	$UNEM$	$INTR$	$INFO$
$\boldsymbol{LDD}$	0.801***	-1.620**	0.008	-4.349*
$\boldsymbol{LED}$	0.317	3.726***	2.564**	4.949
$\Delta\boldsymbol{LDD}$	-	5.781**	11.560***	4.601
$\Delta\boldsymbol{LDD(1)}$	-	-	-	48.834***
$\Delta\boldsymbol{LED}$	-0.041	-	4.695***	-
$\boldsymbol{ECT_{t-1}}$	-0.160***	-0.801***	-0.583***	-0.619***
$\boldsymbol{R^2}$	0.287	0.482	0.573	0.553
$\boldsymbol{D-W}$	1.881	1.679	1.972	1.812
PANEL B (long-run and short-run NARDL results)				
$\boldsymbol{LDD^+}$	0.803***	-7.312***	-1.009	3.869
$\boldsymbol{LDD^-}$	-7.864***	1.261***	4.737***	6.307
$\boldsymbol{LED^+}$	0.034	7.994***	4.648***	-4.381*
$\boldsymbol{LED^-}$	-0.177**	0.774*	2.442***	-1.976
$\Delta\boldsymbol{LDD^+}$	0.088	4.521*	6.485**	-9.577
$\Delta\boldsymbol{LDD^-}$	-2.321*	-5.159**	4.714**	6.081***
$\Delta\boldsymbol{LDD^+(1)}$	-	-	14.179***	25.286***
$\Delta\boldsymbol{LDD^-(1)}$	5.123***	-4.418**	-10.847***	5.797**
$\Delta\boldsymbol{LED^+}$	-	9.449***	12.026***	27.915***
$\Delta\boldsymbol{LED^-}$	-	-	3.561***	7.642**
$\Delta\boldsymbol{LED^+(1)}$	-	-3.516***	-1.706	-20.630***
$\Delta\boldsymbol{LED^-(1)}$	-	-	-2.210**	-
$\boldsymbol{ECT_{t-1}}$	-0.741***	-0.528***	-0.847***	-0.348**

R^2	0.534	0.879	0.938	0.917
$D-W$	2.048	1.868	1.634	1.816

Notes: The estimation results for the ARDL and NARDL models are provided in Panel A and B, respectively, including both long-run and short-run effects. The symbol Δ represents the operator for calculating the initial difference. The asterisk symbols (*), (**), and (***) indicate statistical significance at the 1 percent, 5 percent, and 1 percent levels, respectively. The superscripts "+" and "–" indicate positive and negative partial sums, respectively. The variable ECT_(t-1) represents the coefficient of the error correction term from the previous period. D-W refers to the Durbin-Watson statistic.
Source: Author's computation extracted from E-views output (2023)

Once again, the findings in panel B demonstrate that both the positive and negative aspects of LDD and LED had a significant and positive influence on the INTR in both the short-term and long-term unless there was a negative and insignificant effect observed for the long-term LDD positive. The positive and negative components of the LDD have an impact the INTR. A percentage rise or decrease in these components would cause the INTR to fall or increase by 1.01% and 4.74% in the long run and increase by 6.49% and 4.71% in the short term in Nigeria. In addition, a proportional increase or drop in the positive and negative components of the LED would result in a 4.65% and 2.44% expansion of the INTR in the long term and a 12.03% and 3.56% increase in the short term in Nigeria.

4.3.4 The Impact of Government Borrowing on the Inflation Rate (INFR) in Nigeria

Ultimately, the study evaluates the influence of government borrowing on the INFR in Nigeria. Consequently, the outcome is displayed in the fifth column of Table 4.3.4 provided below.

Table 4.3.4: ARDL/NARDL Regression Result

PANEL A (long-run and short-run ARDL results)				
Variables	$LRGDP$	$UNEM$	$INTR$	$INFO$
LDD	0.801***	-1.620**	0.008	-4.349*
LED	0.317	3.726***	2.564**	4.949
ΔLDD	-	5.781**	11.560***	4.601
$\Delta LDD(1)$	-	-	-	48.834***
ΔLED	-0.041	-	4.695***	-
ECT_{t-1}	-0.160***	-0.801***	-0.583***	-0.619***
R^2	0.287	0.482	0.573	0.553
$D-W$	1.881	1.679	1.972	1.812
PANEL B (long-run and short-run NARDL results)				
LDD^+	0.803***	-7.312***	-1.009	3.869
LDD^-	-7.864***	1.261***	4.737***	6.307
LED^+	0.034	7.994***	4.648***	-4.381*
LED^-	-0.177**	0.774*	2.442***	-1.976
ΔLDD^+	0.088	4.521*	6.485**	-9.577
ΔLDD^-	-2.321*	-5.159**	4.714**	6.081***
$\Delta LDD^+(1)$	-	-	14.179***	25.286***
$\Delta LDD^-(1)$	5.123***	-4.418**	-10.847***	5.797**
ΔLED^+	-	9.449***	12.026***	27.915***
ΔLED^-	-	-	3.561***	7.642**
$\Delta LED^+(1)$	-	-3.516***	-1.706	-20.630***
$\Delta LED^-(1)$	-	-	-2.210**	-
ECT_{t-1}	-0.741***	-0.528***	-0.847***	-0.348**
R^2	0.534	0.879	0.938	0.917
$D-W$	2.048	1.868	1.634	1.816

Notes: The estimation findings for the long-run and short-run effects of the ARDL and NARDL models are provided in Panels A and B, respectively. The symbol Δ represents the operator for calculating the initial difference. The asterisk symbols (*), (**), and (***) indicate statistical significance at the 1 percent, 5 percent, and 1 percent levels, respectively. The superscripts "+" and "−" indicate positive and negative partial sums, respectively. The coefficient of the error correction term lagged by one period is denoted as ECT_(t-1). D-W refers to Durbin-Watson, a statistical test used to detect autocorrelation in regression analysis.
Source: Author's computation extracted from E-views output (2023)

The results in panel A suggest that the impact of LDD and LED on INFR is positive and not statistically significant in both the long run and short run, except for LDD, which shows a negative and statistically significant relationship in the long run. This is consistent with the previous studies undertaken by Iwedi (2020), Akingbade and Nicholas (2020), and Dikeogu (2018). This indicates that an increase in LDD by a certain percentage will lead to a 4.35% decrease in INFR in the long run and a 4.60% increase in INFR in Nigeria in the short term. Similarly, a proportional rise in the LED would lead to a 4.95% increase in the INFR in both the long and short term. The level of DD does not have an impact on Nigeria's INFR in the medium run. There are better metrics for calculating the INFR than foreign borrowing in Nigeria.

Panel B illustrates that the favourable and unfavourable factors of LDD have a beneficial impact on the INFR, but this effect is statistically insignificant in both the long and short term. Positive LDD has no significant short-term influence, whereas negative LDD has a big impact. The data suggests that a percentage increase or decrease in the positive and negative elements of the LDD would lead to a long-term increase of 3.87% and 6.31% in the INFR, as well as a short-term increase of 6.08% and a short-term decline of 9.58% in the INFR. In Nigeria, a slight increase or drop in the positive and negative elements of the LED would lead to a sustained fall of the INFR by 4.38% and 1.98%, respectively. In contrast, this would temporarily increase the INFR by 27.92% and 7.64%, respectively.

Furthermore, the adjustment rate, as indicated in panel A by the error correction term (ECT(-1)), is remarkably significant and consistently negative in all models. These findings indicate that the dependent variables respond to variations in the explanatory factors by approaching the long-term equilibrium level. The findings suggest a consistent relationship between the dependent and explanatory variables over a prolonged duration.

The coefficient of determination (R2) quantifies the extent to which the independent variable can account for the variation in the dependent variable. The explanatory variable explains 29% and 48% of the total variation in the dependent variable in models 1 and 2, respectively. This suggests that the model is not an appropriate fit, and the remaining 71 percent and 52 percent of the differences in the LRGDP and UNEM, respectively, cannot be ascribed to the LDD and LED in Nigeria. Models 3 and 4 show a significant association, as 57% and 55% of the variability in INTR and INFR in Nigeria, respectively, may be related to changes in the LDD and LED. All four models exhibit no autocorrelation, as evidenced by the Durbin-Watson statistic, with coefficient values equal to 2.

The ARDL results demonstrate that the LDD has a symmetrical/linear effect on UNEM and INFR in both the long and short term. Furthermore, over an extended period, LDD impacts LRGDP, but in the near term, it influences INTR. Conversely, LED has both long-term and short-term effects on UNEM and INTR.Similarly, the rate of adaptation shown in panel B is highly significant and consistently negative in all the models. It can be inferred that the dependent variables slowly move toward the equilibrium level because of variations in the explanatory factors. The results further demonstrate a consistent relationship between the dependent and explanatory variables. The coefficient of determination (R2) measures the proportion of the total variance in the dependent variable that the independent variable can explain. The models have shown that LDD and LED significantly impact Nigeria's LRGDP, UNEM, INTR, and INFR, accounting for 53%, 88%, 94%, and 92% of the variation, respectively. The Durbin-Watson statistic demonstrates the absence of autocorrelation in all four models, as indicated by a coefficient value of 2 or near 2.

V. Discussions

This study investigated the impact of domestic and international public debt in Nigeria on critical macroeconomic indicators, such as national output, unemployment, inflation, and INTR, spanning 1980 to 2020. The work utilises many estimation techniques, including the ARDL limits

testing strategy for cointegration and the NARDL bounds testing methodology. The ARDL and NARDL limits tests reveal a cointegrating relationship, suggesting a long-term link between public debt (both foreign and domestic) and the selected macroeconomic variables (such as national output, unemployment, INFR, and INTR).

The results suggest that the estimates from the long-run ARDL model demonstrate a substantial and positive correlation between DD and national output. Short-term estimation reveals an apparent and diminishing influence of ED on national production, which is statistically significant. The ARDL estimation reveals that DD exerts a deflationary influence on unemployment, and this impact is statistically significant. Conversely, a positive and statistically significant correlation exists between ED and the long-term UNEMrate. The preliminary research indicates a statistically significant positive correlation between household debt and UNEMin the short run. According to the expected results of the ARDL model, the study determined that DD has a statistically significant and lowering effect on INFRs.

Conversely, ED exerts an inflationary impact on INTR and is statistically significant over a prolonged period. Aligned with the enduring observations, the immediate examination demonstrates that domestic and international debts have an increasing and statistically significant impact on INTR. The ARDL calculation reveals that DD exerts a deflationary effect on the long-term INFR, and this effect is statistically significant.

The findings of the NARDL model suggest that the positive component of DD has a statistically significant effect on enhancing the national output. Conversely, the detrimental element of internal debt diminishes a nation's overall production over an extended period. Likewise, the harmful component of ED has a significant and lasting effect on the country's overall economic output. Moreover, in the short term, the negative impact of DD reduces the aggregate national output and has statistical importance. The NARDL research revealed that the positive component of DD has a statistically significant impact on reducing UNEMrates and raising the positive component of the UNEMrate.

Nevertheless, foreign indebtedness's positive and negative effects have a lasting and statistically significant influence on unemployment. Once again, the recent study indicates that the harmful component of the DD has a reversal effect on UNEMthat is statistically significant. Conversely, the favourable contribution from external sources has a progressively increasing and statistically meaningful effect on unemployment.

VI. Conclusion

In conclusion, an asymmetric relationship was found among Nigeria's dependent and explanatory variables in both the long and short run. As a result of this, therefore, the following recommendations are made;

Given the adverse effect of public debts (external and DD) on macroeconomic variables considered in the short term, it is advised that the Federal Ministry of Finance should reduce the culture of borrowing to finance Nigeria's annual budget deficit. This will have to do with a significant rationalization of public expenditure, particularly the cost of governance to a sustainable limit. It is also recommended that the Federal Ministry of Finance look inward to generate more revenue through incremental taxes on luxury goods like tobacco and alcoholic drinks instead of borrowing, especially external borrowing. This is important because such an option often comes with a considerable cost, particularly with the depletion of the scarce external reserve to service the debts. It is important to emphasize that Nigeria's economy and the central government's income must be completely diversified away from crude oil into areas like agriculture and solid mineral mining. Undoubtedly, the volatility in oil prices contributes to the country's increasing trend of public debt.

In addition to diversifying the economy and increasing government revenue, the government must minimise corruption in the system by utilising the Economic and Financial Crime Commission (EFCC) and Independent Corrupt Practices and Other Related Offences Commission (ICPC) effectively and efficiently. This is because corruption is believed to cause revenue loss, leading to the need for borrowing to meet government obligations. Additionally, it is imperative for the Debt Management Office, the CBN, and the Federal Ministry of Finance, responsible for overseeing Nigeria's public debt, to maintain accurate records of debt payment obligations. It is crucial to ensure that the debt does not surpass a predetermined threshold, based on the debt-to-GDP ratio and debt service-to-revenue ratio, to prevent excessive debt burden.

Acknowledgement
We acknowledge the support that University of Abuja gave us during this study.

References

[1]. Adam, A. J., Sule, M., Anthony, A. A. & Ibrahim, M. (2016). The Impacts of DD on Economic Performance in Nigeria (1970-2013): Journal of Economics and Sustainable Development. 7(8), 54 - 64.
[2]. Adam, J.A. & Bankole, A.S. (2000). The Macroeconomics of Fiscal Deficits in Nigeria. Nigerian Journal of Economics and Social Studies, 42(3), 263-289
[3]. Aimola, A. U. & Odhiambo, Nicholas, M. (2021). "Public debt and inflation: Empirical evidence from Ghana," Working Papers 27063, University of South Africa, Department of Economics.
[4]. Akinkunmi, M.A. (2017). Empirical Investigation of ED-Growth Nexus in Sub-Saharan Africa. African Research Review, 11, 142-152.
[5]. Akpansung, A. O. & Gidigbi, M.O. (2020). Domestic Public Debts and Economic Growth Nexus: The Nigeria Evidence, American Journal of Economics and Business Management, 6(1), 2576-5973.
[6]. Alejandro, D. J. & Ileana, R. J. (2017). Impact of Government Debt on Economic Growth: An Overview for Latin America, Working papers of the Department of Economics University of Perugia (IT), Working Paper No. 28
[7]. Aybarç, S. (2019). The Theory of Public Debt and Current Reflections. IntechOpen Publisher, Turkey, pp. 1–11, DOI: http://dx.doi.org/10.5772/intechopen.82730.
[8]. Bakare, A. S. (2010). Debt Forgiveness and its Impact on the Growth of Nigerian Economy: Pakistan Journal of Social Science. 7(2), 34 – 39.
[9]. Benjamin, I. E., Alexander, E. O., Godswill, O. O. & Ofe I. I. (2020). Dynamic Relations Between Public ED and Economic Growth in African Countries: A Curse or Blessing? Journal of Open Innovation. Technology, Market, and Complexity. 6(88). DOI:10.3390/joitmc6030088. www.mdpi.com/journal/joitmc
[10]. Chen S., Paola G., Lucy L., Leonardo M., & Soledad M. P. (2018). Debt Maturity and the Use of Short-term Debt. Evidence from Sovereigns and Firms. International Monetary Fund Publication 19(03)
[11]. Chukwuka & Mma (2019). Is a Debt Crisis Looming Africa? Africa in Focus. Cointegration tests. Applied Economics, 37(17), 1979-1990.
[12]. Debt Management Office (2016). Nigeria's Debt Management Strategy, 2016-2019.
[13]. Debt Management Office (2019). Public Debt Data. Press Release Q1.
[14]. Didia, D. & Ayokunle, P. (2020). External Debt, Domestic Debt and Economic Growth: The Case of Nigeria. Advances in Economics and Business 8(2): 85-94, 2020. retrieved from http://www.hrpub.org DOI: 10.13189/aeb.2020.080202.
[15]. Dikeogu, C. C. (2018). The effect of public spending on inflation in Nigeria. International Journal of Advanced Academic Research, Social and Management Sciences, 4(12), pp 52-66.
[16]. Ebi, B. O., & Imoke, I. D. (2017). Public Debt Carrying Capacity and Debt Transmission Channels: The Nigerian Experience. International Journal of Economics and Financial Issues, 7(5), 41–52
[17]. El-Yaqub, A. B., Musa, I. & Magaji, S. (2024), Analysis of the Impact of Domestic Dept on the Nigeria Economy: 1980-2021, African Journal of Accounting and Financial Research, 7(2), 29-39.
[18]. Essien, S. N., Ngozi , Agboegbulem, T. I., Mba M. K. & Onumonu, O. G. (2016). An Empirical Evidence from G7 and ASEAN Countries. Masters Theses, 3642. Retrieved from https://thekeep.eiu.edu/theses/3642
[19]. Eze, O. R. & Nwambeke, G. C. (2015). Effect of Deficit Financing on UNEMRate in Nigeria: an error correction model. International Journal of Small Business and Entrepreneurship Research 3(7), 28-46.
[20]. Ezeabasili, V.N., Isu, H.O & Mojekwu, J.N. (2011). Nigeria's ED and Economic growth: An error correction approach. International Journal of Business and Management, 6(5), 156-163.
[21]. Idenyi, O.S., Igberi, C.O. & Anoke, C.I. (2016). Public Debt and Public Expenditure in Nigeria: A Causality Analysis. Research Journal of Finance and Accounting. 7(10), 27–38.
[22]. Iwedi, M. (2020). Granger Causality Analysis between DD and Inflation in Nigeria. Journal of Development Economics and Finance. 1(1), 135–149.
[23]. Jude, C. (2020). Rising UNEMin Nigeria: Public Debt to the Rescue? Current Research Journal of Social Sciences. 3(2), 280-290
[24]. Keynes J. M. (1936). The General Theory of Employment, Interest and Money. HTML, 2003 version by Steve Thomas for The

University of Adelaide Library Electronic Texts Collection. http://etext.library.adelaide.edu.au/k/k44g/k44g.zip.

[25]. Khramov V. & Lee R. (2013). The Economic Performance Index (EPI): An intuitive indicator for assessing a country's economic performance dynamics from a historical perspective. IMF working paper. WP/13/214. https://www.imf.org/external/pubs/ft/wp/2013/wp13214.pdf

[26]. Magaji & Musa (2015), Endemic Corruption and Nigeria's Underdevelopment, Abuja Journal of Business and Management, 1(4), 119-125.

[27]. Magaji (2000), Nigeria and Foreign Dept: The Desire for Economic Development Verses Imperialism, Journal of Economics and Allied Fields, 1(2), 11-25.

[28]. Magaji, S. (2000). Nigeria and Foreign Debt: The Desire for Economic Development Versus Imperialism, The Abuja Journal of Economics and Allied Field, 1(1), 37-43

[29]. Matthew,'A.,'D.'B.'M.,'&'I.'O.'A.'(2016).'The' Impact'of'Corruption'on'External'Debt'in'Nigeria,=L'A'CBIntegration'Approach'(1996B2014).'Advances)in)Social)Sciences)Research)Journal,)3(4))84B95.

[30]. Musa & Ismail (2023), Impact of Government Expenditures on Economic Growth in Nigeria (1970-2020), International Journal of Management and Business Applied, 2(2), 94-107.

[31]. Musa, I., Magaji, S., Eke, C. I. & Abdulmalik O. Y. (2022), Poverty and its Intratcability: Causes and Consequences, InclusiveSociety and Sustainability Studies, 2(2), 48-58

[32]. Ogbonna, K. S., Ibenta S. N., Chris-Ejiogu, U. G. & Atsanan, A. N. (2019). Public Debt Services and Nigerian Economic Growth. European Academic Research 6(10), 5714–5740.

[33]. Ogonna, I. C., Idenyi O. S., Ifeyinwa, A. C., & Gabriel N. U. (2016). The Implications of

[34]. Omotoye et al. (2006), cited in Folorunso S.A and Ayadi F.O (2008). The Impact of External

[35]. Perron, P. (1997). "Further evidence on breaking trend functions in macroeconomic variables," Journal of Econometrics, Elsevier, vol. 80(2), 355–385.

[36]. Rafindadi, A. S. (2012). Macroeconomic Policy, Output and UNEMDynamics in Nigeria: Is There Evidence of Jobless Growth? Available at SSRN: https://ssrn.com/abstract=2135752 or http://dx.doi.org/10.2139/ssrn.2135752 in

[37]. Sanus, K.A., Hassan, A.S. & Meyer, D.F. (2019). Nonlinear Effects of Public Debt on Economic Growth in Southern Africa Development Community (SADC) Countries. International Journal of Economics and Management. 13(1), 193-202.

[38]. Sanusi, J.O., (2002). The evolution of monetary management in Nigeria and its impact on economic development. CBN Bullion, 26(1): 1-19.

[39]. Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2014). Modeling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. In R. Sickles & W. C. Horrace (Eds.), Festschrift in honor of Peter Schmidt, 281–314

[40]. Veiga, J. A. L., Ferreira-Lopes, A. & Sequeira T. N. (2014). Public Debt, Economic Growth, and Inflation in African Economies. Munich Personal RePEc Archive.