

# Pensions and Gratuities, Public Debt Servicing and Economic Growth of Nigeria: An ARDL Approach

Chinweoke Nwaeze, PhD

*Department of Banking and Finance, Abia State Polytechnic, Aba, Nigeria.*

Corresponding author: [chinweoke.nwaeze@abiastatepolytechnic.edu.ng](mailto:chinweoke.nwaeze@abiastatepolytechnic.edu.ng)

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## Abstract

Government expenditure across the globe is generally intended to enhance citizens' welfare through the provision of public goods and services and thus, induce growth of economies. Pensions and gratuities as well as public debt servicing are classified under transfer expenditure of government. Thus, this study broadly examined the effects of pensions and gratuities and public debt services expenditure on economic growth of Nigeria for the period 1981-2020. The time series data for the study period were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin as well as the National Bureau of Statistics (NBS). Real Gross Domestic Product (RGDP) served as the dependent variable while Government expenditure on pensions and gratuities (GEXPGR) and Government expenditure on public debt servicing (GEXPDS) served as independent variables. Inflation rate was introduced in this work as a control variable to ensure robustness of the study. The Augmented Dickey-Fuller (ADF) unit root test technique was employed to test the stationarity of the variables in the model. The result revealed a mixed order of I(0) and I(1). Thus, the Auto-Regressive Distributed Lag (ARDL) Bounds test was adopted to test the long-run relationship (co-integration) among variables and estimate the long-run and short-run dynamics of the analysis. Findings of the study revealed that government expenditure on pensions and gratuities, and debt servicing had positive and significant effects on economic growth of Nigeria in the long-run. In the short-run, government expenditure on pensions and gratuities had a positive and significant effect on economic growth of Nigeria while public debt servicing was found to be positive but non-significant. Inflation rate was found to have negative and non-significant effects on economic growth of Nigeria in both the short and long-run for the period studied. The study therefore, recommended that the Nigerian government should sustain and improve budgetary allocations to pensions and gratuities to guarantee relative comfort among pensioners and at the same time, ensure adequate and regular servicing of both domestic and external debts to induce further growth in the economy.

**Keywords:** Transfers Payment, Pensions and Gratuities, Public Debt Servicing, Economic Growth.

## Introduction

Globally, it remains the responsibility of government to spend on goods and resources that majorly enhance citizens' welfare and at the same time induce economic growth. The Keynesian school of thought believes in the efficacy of government expenditure especially capital expenditure in inducing growth of an economy. Over the years, the government of Nigeria has continued to devote enormous resources to enhance citizens' well-being. These

expenditures are generally classified as capital expenditures and recumbent expenditures. Nwaeze (2016) posits that recurrent expenditure involves regular expenditures of government on overheads and personnel cost such as salary payments, transportation, utilities, equipment upkeep etc., while capital expenditures of government entail investment spending on infrastructural facilities and capital projects such as hospitals, acquisition of fixed assets, bridges, roads etc.

According to Ezeama (2019), government expenditure becomes necessary due to the perceived market economy failure in effectively and efficiently allocating resources to attain an all-inclusive economic growth. In general, there has been increased expansion of government expenditure over the years. However, these increased expenditures seem not to have solved the problem of underdevelopment in the country. According to NBS report in ThisDay Newspapers of 17<sup>th</sup> November, 2022, 133 million Nigerians live in poverty, this represents 63% of the total population.

More than 50% of Nigerians live in squalor, subsisting on less than \$1 (USD) per day (Nwanmuo, 2020). Relating to the main target of this study, it is hoped that as government finances pensions and gratuities, it is expected that the level of domestic output will rise which will in turn promote growth of the economy. Again, retirees will be active by engaging in various economic activities such as trading, real estate development etc. All these will spur economic growth. In the same vein, government's ability to pay or service its debts as at when due, increases creditor trust and has the potential to secure more productive debts to strengthen the developmental framework of the nation such as infrastructural facilities. This boosts growth of the economy.

Today in Nigeria, government's funds are mainly spent on administration, social and community services, economic services and transfers. However, the target of this study is on transfer payments of government and its impact on the growth of the Nigerian economy. These transfer payments will include pensions and gratuities payment which consists of aggregate expenses in annuity and endowments as government financial responsibility to our senior citizens and public debt service payments which include all expenses of government as a financial duty to its creditors as government is expected to pay off its debts as they fall due. Others include repayments.

Further, there is a dearth of works on studies on public expenditure involving pensions and gratuities as well as public debt servicing. The few ones are characterized by a mixed bag of results i.e. inconclusive results. These have created a research lacuna which this present study seeks to fill. This study covered the period 1981 to 2020. This period covers the pre-SAP era and post-SAP era. The pre-Sap era depicts a period of low budgeted public expenditure while the post-SAP era reflects a period of increased government expenditure which invariably is expected to enhance growth in the economy. However, the study was constrained by finance and time needed to effectively conduct the research. On completion of the work, the findings will deepen the knowledge and understanding of the impact of pensions and gratuities payment as well as public debt service payment on economic growth of Nigeria.

### Statement of the Problem

Today in Nigeria, insecurity is the order of the day. Kidnapping, banditry, activities of unknown gunmen etc., are on the increase. Health and education sectors are not well catered for and as a result, strikes and brain drain are predominant in these two critical sectors. The agricultural and manufacturing sectors are in dire need of attention as power is highly epileptic and unrealistic, thus, resulting to low productivity in these sectors. Pensions and gratuities payment remains a mirage to our senior citizens, while domestic and external debt burdens as well as interest charges are mounting even as the budgeted expenditure aimed at enhancing the welfare of citizens and growth of the economy keep increasing. This development seems not to have reflected on the growth of the economy.

### Objectives of the Study

The general objective of the study is to examine the impact of transfers expenditure on economic growth of Nigeria for the period 1981 - 2020.

The specific objectives of this study include to:

1. examine the impact of pensions and gratuities on economic growth of Nigeria.
2. investigate the impact of public debt servicing on economic growth of Nigeria.

### Review of Related Literature

#### Conceptual Review

##### Concept of Economic Growth

Economic growth as posited by Oluitan (2012) refers to a steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national output and income. It is viewed as increase in output. Economic growth is related to a quantitative sustained increase in a country's per capita income or output accompanied by expansion in its labour force, consumption, capital and volume of trade. The major features of economic growth include: high rate of productivity, high rate of structural transformation, international flows of labour, goods and capital etc. Therefore, there is sustained economic growth when there is a sustained increase in the actual output of goods and services per head (Jhingan, 2009).

##### Concept of Pensions and Gratuities and Debt Servicing

Expenditure on transfers involves government expenditure disaggregated into public debt interest charges, capital repayment, external financial obligations, pensions and gratuities, including government expenditure on pensions and gratuities as financial obligations of government on senior citizens of a country. Pension and gratuities payment does not earn income in return for government but assists the government in carrying out its statutory obligations to those who contributed their quota to the country during their active working days (Uremadu and Nwaeze, 2019). Such expenditures offer welfare to the vulnerable segments of the society. Government expenditure on public debt servicing includes all expenses of government on the debt interest servicing as financial obligations of

government to its creditors. Pensions and gratuities expenditure as well as public debt servicing expenditure are classified under transfers expenditure.

### **Theoretical Review**

#### **The Intermediation Theory**

The Intermediation Theory, developed by Diamond and Dybvig (1983) emphasized that pension funds can effectively intermediate with the financial system to spur growth. The traditional theory of financial intermediation is hinged on the real-world market characteristics of transaction costs and asymmetric information. These are central to the activity of banks, insurance companies and other related financial institutions. Here, financial intermediaries are seen as delegated monitors to overcome the issue of asymmetric information, where diversification can reduce monitoring costs. In the same vein, market finance is seen to be available only to those borrowers with good reputation. The cardinal point in this theory is that the operations of pension funds act as agents to economic growth by empowering the functions of financial systems more efficiently in credit creation. This study is hinged on this theory.

#### **Keynesian Theory**

Of all economists who discussed the relationship between public expenditure and economic growth, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regarded public expenditure as an exogenous factor which could be utilized as a policy instrument to promote economic growth. From the Keynesian thought, public expenditure could contribute positively to economic growth. Hence, an increase in the government consumption was likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augmented the aggregate demand, which provokes an increased output depending on expenditure multipliers.

John M. Keynes, a British economist and the father of macroeconomics argued that public expenditure is a fundamental determinant of economic growth. Keynes theory made it clear that fiscal policy instruments (i.e., government expenditure) is an important tool for achieving short-term stability and superior long run growth rate. To achieve stability in the economy, this theory prescribes government interventions in the economy through economic policy specifically fiscal policy. Keynes argued that there is need for government to intervene in the economy because government could alter economic downturns by borrowing money from the private sector of the economy and then returning the money to the private sector through its various spending programmes.

In addition, government capital and recurrent expenditure aid in the building of quality classrooms, laboratories, purchase of teaching and learning aids including computes and payment of salary will have multiplier effect on the economy. Expenditure on education will improve productivity and development by raising the quality of the labour force. It will also

help in creating a body sector of the economy to plan and manage the economy. This study is hinged on this theory.

### Empirical Review

The study by Mgbada, Nwite, Ele, Uguru and Tebepah (2023), examined the effects of Nigerian pension scheme on economic growth of Nigeria for the period 2007-2021. *Ex post facto* design was adopted in this study and secondary time series data were sourced from the Central Bank of Nigeria Statistical Bulletin. The AutoRegressive Distributed Lag (ARDL) model was used in data analysis. Findings of the study revealed that total pension funds contribution had significant positive effect on the Gross Domestic Product (GDP) while inflation rates showed a negative effect on the economic growth of Nigeria. The study concluded that the Nigerian Pension Scheme had a significant positive effect in economic growth of Nigeria and thus, recommended government should ensure adequate and best quality investment of pension funds in order to help grow the Nigerian economy.

The link between pensions fund investment and economic development of Nigeria was examined by Ogonda and Oklakpe (2022). Pensions Fund Investment was proxied by money market instruments, federal government securities, quoted ordinary shares and corporate loan instruments while Human Development Index (HDI) was used to represent economic development of Nigeria. Secondary time series data for the period 2000-2022 were obtained from National Pensions Commission, World Bank and National Bureau of Statistics. Descriptive Statistics, Correlation and Fixed/Random Effects Regression Model were used in data analysis. Empirical results of the study revealed that pension fund investment in money market instruments had a negative and insignificant effect on HDI, while pension fund investments in federal government securities had a positive and insignificant effect on HDI. Pensions fund investments in quoted ordinary shares and corporate loan instrument had positive influence on the development of Nigeria in terms of HDI for the period studied. The study thus recommended amongst others that more pensions fund investments are needed in ordinary shares and corporate loan instrument in order to improve economic development in terms of HDI in Nigeria.

Nwaeze and Avoaja (2022) examined the impact of government recurrent expenditure on economic growth of Nigeria for the period 1981-2020. Secondary time series data were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin. Real Gross Domestic Product, proxy for economic growth was adopted as the dependent variable while government recurrent expenditure on administration, education, health, agriculture and pensions and gratuities were adopted as the independent variables. The Augmented Dickey-Fuller (ADF) unit root was employed to test the stationarity of the variables. Vector Error Correction Model (VECM) was also adopted to estimate the short and long run analysis of the study. Findings of the study revealed that government recurrent expenditure on administration, health, agriculture and pensions and gratuities had negative and insignificant impacts on economic growth in the short-run while government recurrent expenditure on education had a negative and insignificant impact on economic growth of

Nigeria in both the short run and long run. Government recurrent expenditure on health and agriculture had negative and significant impact on economic growth in the long run but government recurrent expenditure on administration had a positive and significant impact on economic growth in the long run. Government recurrent expenditure on pensions and gratuities had a positive and insignificant impact on economic growth in the long run.

Onyebuchi (2020) examined the indirect effect of pension fund on economic growth in Nigeria through the financial system. Secondary data as well as the Autoregressive Distributive Lag (ARDL) technique were employed in the study. Empirical result showed that pension fund contribution was effective in stimulating growth through investment in portfolios that yield short-term returns. The implication of this is that pension fund contribution cannot on its own without a credible financial system impact on economic growth.

Uremadu, Orikara and Uremadu (2019) investigated the relationship between government recurrent expenditure and economic growth in Nigeria for the period 1999 – 2018. Using secondary time series data, the paper disaggregated government recurrent expenditures into five categories used as explanatory variables. The results of the study showed that the influence of government expenditure on National Assembly, pension and gratuities had insignificant effect on economic growth. Total government expenditures on administration and public debt servicing had a positive and insignificant effect on economic growth. Again, the study revealed that total government expenditure on transfers had insignificant effect on economic growth.

Ekpah, Ogbe, Salihu, Aruna and Akubo (2019) evaluated the contribution of government expenditure to economic growth in Nigeria from 1961-2017. Government expenditure was proxied by government recurrent (GREXP) and pensions and gratuity (PEGR), while economic growth was represented by real gross domestic product (RGDP). Time series data used were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and analyses done using correlation and Ordinary Least Squares Technique (OLS). Findings showed that government recurrent expenditure and pensions and gratuities had a significant positive contribution to economic growth in Nigeria.

Ezema (2019) examined the responsiveness of economic growth to government expenditure in Nigeria. The study investigated the responses of pensions and gratuities expenditure on real gross domestic product in Nigeria for the period 1981 to 2016. Pensions and gratuities served as the independent variables while real gross domestic product served as the dependent variable. The study employed Ordinary Least Squares (OLS) technique and the Error Correction Mechanism (ECM) technique as the analytical tools. Empirical findings showed that pensions and gratuities expenditure of government had a positive and significant response on economic growth in Nigeria in the long-run.

Otiwu, Chukwu and Okere (2018), examined the impact of public expenditure on economic growth in Nigeria from the period 1980 – 2013. Secondary data were collected from Central Bank of Nigeria (CBN) Statistical Bulletin. The core objective of the study was to determine the impact of public expenditure on Nigeria's economic growth. In the model specification,

model regression model was adopted, having reviewed the literature theoretically, as well as empirically. The results obtained from their analysis revealed that less or no significant relationship existed between Nigeria's real public expenditure and level of economic growth from 1980 – 2013. However, in terms of the individual contribution on the dependent variable, it was discovered that at 5% level of significance, all the variables were insignificant. This therefore, indicated a negative effect on the level of economic growth in Nigeria. The work therefore concluded that in the long-run, all the problems of inconsistency in the government spending will be corrected since there is a long-run relationship among the parameters estimates. The study recommended that government should ensure that capital and recurrent expenditure are properly managed so as to raise the nation's productive capacity. Also recommended in the study is proper monitoring of government expenditure in order to avoid misappropriation and diversion of fund and finally, government should direct more expenditure towards the production sector of the economy so as to reduce the cost of living as well as raising the standard of living of the citizenry

Daniel, Simeon and Itode (2018) examined the effect of public investment in the social sector on employment generation in Nigeria between 1980 and 2016. Time series data were sourced from secondary sources on unemployment rate (UNE) a proxy for employment generation, government expenditure on education (EDU), government expenditure on health (HEH) and government expenditure on other social and community services (COM). The data set were analyzed based on the Dynamic OLS proposed by Stock-Watson (1993) technique of analysis to estimate the model. The result of the analysis revealed that government expenditure on education (EDU) is rightly signed and is statistically significant while government expenditure on health (HTH) and government expenditure on other social and community services (COM) were wrongly signed and statistically significant at 5 percent level. This implies that government expenditure on health (HTH) and government expenditure on other social and community services have not generated employment in Nigeria within the period under review.

Ameh, Ajieh and Duhu (2017) investigated the impact of contributory pension schemes on economic growth in Nigeria using the Ordinary Least Squares (OLS) technique. Empirical findings of the study revealed that about 82% of the variation in the economic growth in Nigeria is tied to the variation in the indices of the contributory pension scheme which include – pension fund assets, pension fund contribution and investment. Only the relationship between the pension investment and economic growth is found to be significant at 5% confidence level.

Matthew (2017) studied the effect of funded pension scheme on economic growth of Nigeria for the period 2006 to 2015. The study made use of secondary data obtained on gross domestic product and pension funds from both public and private sectors for the period of ten years. The Ordinary Least Squares (OLS) method of data analysis was employed. The study found empirical evidence that the adoption of the new pension fund had significant positive impact on the economic growth of Nigeria for the period studied.

Consolidation of the contributory pension scheme to enhance economic growth was recommended.

Farayibi (2015) examined the effect of funded pension scheme on economic growth in Nigeria. The study employed the Error Correction Mechanism and Ordinary Least Squares (OLS) techniques in data analysis. Findings revealed that pension contributed funds from both public and private sectors have positive effect on the economic growth of Nigeria for the period studied.

### **Gap in Empirical Literature**

Many literatures abound in the area of public expenditure. However, there is a dearth of works on pensions and gratuities likewise public debt servicing as classified under transfer expenditure of government. Of all papers reviewed in this work, only Nwaeze and Avoaja (2022) captured pensions and gratuities and public debt servicing as variables in the study. Ezema (2019) captured only pensions and gratuities. These few works are also characterized by mixed bag of results. Thus, this scenario has created a lacuna which the present study seeks to bridge.

### **Research Methodology**

#### **Research Design**

*Ex-post facto* research design was used in this study. It links the dependent and independent variables using already existing secondary data (Osuala, 2010). The study design is preferred when a cause-and-effect link is known and the researcher cannot influence the data. Nigeria has already existing data for all the variables in the model.

#### **Nature and Sources of Data**

Secondary data, primate time series data, were employed in this study. Data from the Central Bank of Nigeria (CBN) Statistical Bulletin as well as from the National Bureau of Statistics (NBS) were used in this investigation.

#### **Methods of Data Analysis**

The study made use of the unit root test and Auto-Regressive Distributive Lag (ARDL) Bounds test build a research model of pensions and gratuities and public debt servicing expenditure impact on economic growth of Nigeria. To avoid the issue of spurious result from the use of non-stationary data set, the study made use of pre-testing technique involving the Augmented Dickey-Fuller unit root test, to test the stationarity of the variables. The result revealed a mixed order of integration i.e.  $I(0)$  and  $I(1)$ , hence the adoption of the Auto-Regressive Distributive Lag (ARDL) bound test to test the long-run relationship (co-integration) among the variables and the short-run and long-run analysis of the study.

### Model Specification

Ezema (2019) specified a model involving government sector expenditure in pensions and gratuities and its implications to the Nigerian economy as below:

$$RGDP = f(PENGEX) \dots \dots \dots \text{eqn 1}$$

Where:

RGDP = Real gross domestic product (proxy for economic growth)

PENGEX = Pensions and gratuities expenditure

$f$  = Functional relationship notation

This model was adopted and modified to suit the objectives of the present study.

Thus, we have:

$$RGDP = f(GEXPGR, GEXPDS, INFR) \dots \dots \dots \text{eqn 2}$$

Where:

RGDP = Real gross domestic product

GEXPGR = Government expenditure on pensions and gratuities

GEXPDS = Government expenditure on public debt servicing

INFR = Inflation Rate

Transforming eqn (2) into its linear econometric form, we have:

$$RGDP = \beta_0 + \beta_1 GEXPGR + \beta_2 GEXPDS + \beta_3 INFR + \mu \dots \dots \dots \text{eqn 3}$$

Where:

$\beta_0$  = Constant

$\beta_1, \beta_2, \beta_3$  = Coefficient parameters of the explanatory variables

$\mu$  = Stochastic variable or error term

To bring the variables to the same base, the equation is transformed to its logarithm form as below:

$$LN RGDP = \beta_0 + \beta_1 LN GEXPGR + \beta_2 LN GEXPDS + \beta_3 LN INFR + \mu \dots \dots \dots \text{eqn 4}$$

By a priori,  $\beta_0 > 0$ ,  $\beta_1 > 0$ ,  $\beta_2 > 0$  and  $\beta_3 < 0$ .

**Table 1: Apriori Expectation**

Table below shows the variables with their theory intuition and expected signs:

| Variables               | Theory Intuition                                                                                                                                                  | Expected Sign |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Pensions and Gratuities | Pensions and gratuities payment is expected to raise retirees' welfare and domestic production, thus boosting economic growth.                                    | +             |
| Public Debt Servicing   | By paying off its debts as they fall due, government may arrange more profitable borrowing and thus, encourage economic growth.                                   | +             |
| Inflation Rate          | Increasing Inflation Rate is generally expected to negatively affect economic growth as it reduces competitiveness and also lowers the purchasing power of money. | -             |

**Source:** Researcher's Computation, 2023

## Data Analysis and Results

### Trend Analysis

#### Trend Plot of the Data

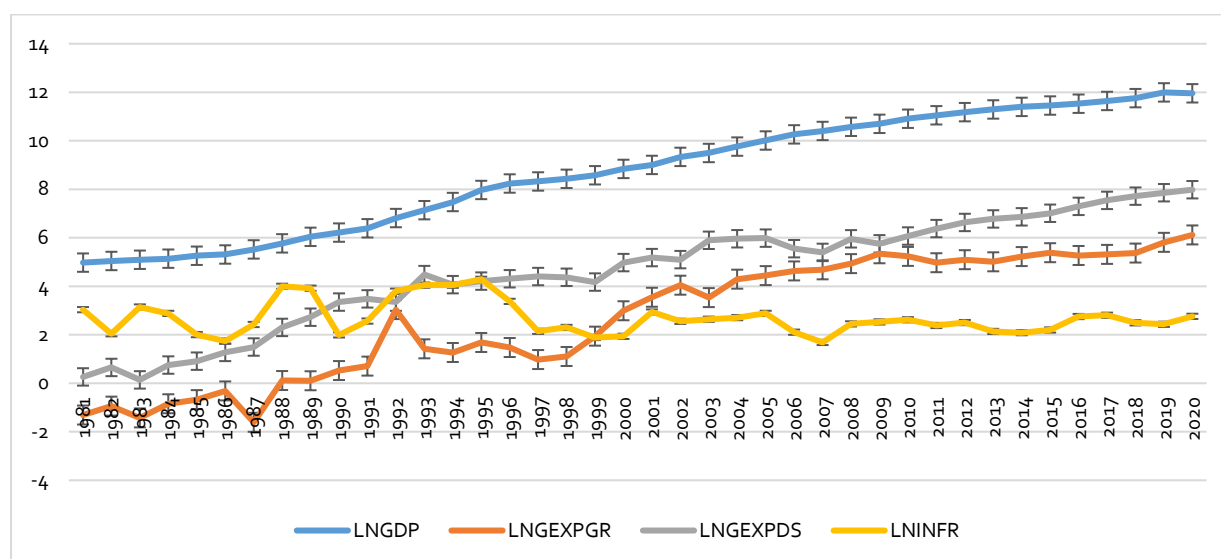


**Fig. 1:** Trend plot of the data

Fig.1 shows that the trend of the variables did not follow the same pattern. For instance, while LNGDP was generally rising sluggishly, LNGEXPGR, LNGEXPDS and LNINFR fluctuated significantly. This could be attributed to inconsistent government policies and low expenditures on pensions and gratuity, excessive debt servicing and unstable rate of inflation.

### Descriptive Statistic

The data analysis started with the description of the basic features associated with dataset in Table 2. These features comprise the mean, maximum and minimum values, standard deviation, skewness and Kurtosis.

**Table 2: Descriptive statistic**

|              | LNGDP     | LNGEXPGR  | LNGEXPDS  | LNINFR   |
|--------------|-----------|-----------|-----------|----------|
| Mean         | 8.706456  | 2.711866  | 4.614483  | 2.681188 |
| Median       | 8.921368  | 3.285561  | 5.037617  | 2.542763 |
| Maximum      | 11.99420  | 6.117017  | 7.981122  | 4.288204 |
| Minimum      | 4.975561  | -1.609438 | 0.139762  | 1.684176 |
| Std. Dev.    | 2.399084  | 2.476152  | 2.270577  | 0.683973 |
| Skewness     | -0.229641 | -0.310525 | -0.497346 | 0.871012 |
| Kurtosis     | 1.621363  | 1.620897  | 2.243881  | 2.928821 |
|              |           |           |           |          |
| Jarque-Bera  | 3.519301  | 3.812715  | 2.601878  | 5.066194 |
| Probability  | 0.172105  | 0.148621  | 0.272276  | 0.079413 |
|              |           |           |           |          |
| Observations | 40        | 40        | 40        | 40       |

**Source:** Author's computation using E-Views 10.0

The mean and median values of the transformed data are averagely of the same value, as this is one of the assumptions of normal distribution, thus the series could be said to be normally distributed. Also, the standard deviation which measures the dispersion of the series from the mean reveals that all the series in the distribution sparingly dispersed from the respective mean values which also indicate traits of normal distribution. This normal distribution of the series is confirmed from the skewness, as nearly all the skewness value are within the average of the threshold (0), showing that the series in the distribution are slightly skewed either positively or negatively but approximately normal in distribution. From the p-values of the Jarque-Bera test, a test for normality; since all the p-values are greater than the significant level of 5%, thus the null hypothesis which states that the series are normally distributed cannot be rejected. In conclusion, the result confirms the normality of the series in the distribution; hence regression analysis can be applied for the model estimation.

### Test of Stationarity

#### Unit Root Test

This study applied the Augmented Dickey-Fuller (ADF) test technique to confirm the stationarity status (unit root) of the transformed data to ascertain the best estimation approach for the model. The ADF test results are presented in Table 3:

**Table 3: Unit root test results**

| Variable               | ADF @ level |           |                | ADF first difference |           |            |
|------------------------|-------------|-----------|----------------|----------------------|-----------|------------|
|                        | t-stat.     | Prob.     | Remark         | t-stat.              | Prob.     | Remark     |
| LNGDP                  | -1.219025   | 0.6565    | non-stationary | -3.249442            | 0.0247    | stationary |
| LNGEXPGR               | -1.074751   | 0.7161    | non-stationary | -8.666699            | 0.0000    | stationary |
| LNGEXPDS               | -2.243569   | 0.4534    | non-stationary | -8.149483            | 0.0000    | stationary |
| LNINFR                 | -4.441570   | 0.0057    | Stationary     | --                   | --        | --         |
| <b>Critical values</b> | 1%          | 5%        | 10%            | 1%                   | 5%        | 10%        |
|                        | -3.610453   | -2.938987 | -2.607932      | -3.615588            | -2.941145 | -2.609066  |

**Source:** Author's computation using E-Views 10.0

From the outcome of the ADF examination presented in Table2, it is observed that the natural log of the variables are non-stationary as they are integrated of order one,  $I(1)$  with the exemption of Inflation rate (INFR) which is  $I(0)$ . This is because, at level, the t-stat. associated with LNGDP, LNGEXPGR and LNGEXPDS falls below the critical values at all levels of significance with probability values that are greater than 0.05 but were found to be greater than the critical values at first difference with probability values that are less than 0.05. On the other hand, the t-stat. of LNINFR is seen to be higher than critical values at level with a probability value that is less than 0.05. It then implies that the variables under consideration are of mixed level of integration, that is,  $I(0)$  and  $I(1)$  with none of the variables achieving stationarity at  $I(2)$ . This, therefore, stresses the need to conduct an ARDL bounds test for cointegration test to see if a long-run connection exist between the variables that are of mixed integration (see, Pesaran, Shin and Smith, 2001).

### Bounds Test

The cointegration test using bounds test approach is performed and the outcome is displayed in Table 4.

**Table 4: Bounds test result**

| Test Statistic | Value    | Signif. | $I(0)$ | $I(1)$ |
|----------------|----------|---------|--------|--------|
| F-statistic    | 5.350421 | 10%     | 2.37   | 3.2    |
| K              | 3        | 5%      | 2.79   | 3.67   |
|                |          | 1%      | 3.65   | 4.66   |

**Source:** Author's computation using E-Views 10.0

Table 3 displays the result of ARDL bounds test for cointegration. Given the computed F-statistic 5.350421 greater than upper bound value, that is,  $F > I(1)$  at both 1% and 5% levels

of significance indicates rejection of the null hypothesis of no cointegration; thereby establishing the presence of a long-run connection among the model variables. The appropriate ARDL selected is; ARDL (4, 3, 5, 2), implying 4, 3, 5 and 2 lags for LNGDP, LNGEXPGR, LNGEXPDS and LNINFR, respectively.

#### Auto Distributive Regressive Lag (ARDL): Long-run estimates

The estimated long-run coefficients for the ARDL model are given in Table 5:

**Table 5: Long-run estimates**

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| LNGEXPGR | 0.361645    | 0.087172   | 4.148633    | 0.0007 |
| LNGEXPDS | 0.621539    | 0.101200   | 6.141675    | 0.0000 |
| LNINFR   | -0.191056   | 0.221008   | -0.864474   | 0.3994 |
| C        | 6.119534    | 0.342557   | 17.86427    | 0.0000 |

**Source:** Author's computation using E-Views 10.0

The long-run estimate of LNGEXPGR indicates that an increase in government expenditure on pension and gratuity caused approximately 0.361645 increase in LNGDP, implying that government expenditure on pension and gratuity enhanced economic growth in the long-run. The effect of LNGEXPGR was found to be significant at 1 per cent level since its probability value of 0.0007 is less than 0.01. This is plausible due to the fact that increase in government spending on pension and gratuity would increase consumption of goods and services which in turn trigger more production to meet the rising demand. Similarly, some individuals who receive these pension and gratuity engage in petty business that yield long-term returns and contribute immensely to gross domestic product of Nigeria.

Also, it is observed from the estimated long-run coefficient of LNGEXPDS that an increase in government expenditure on debt servicing resulted in a 0.621539 increase in LNGDP, indicating that an increase in government expenditure on debt servicing induced economic growth in Nigeria. With a probability value of 0.0000 which is less than 0.01, the impact of LNGEXPDS on LNGDP was considered significant at 1 per cent level. However, the positive and statistically significant impact of government debt servicing on economic growth in Nigeria could be due to the fact that timely repayment of borrowed funds increases credit worthiness of a government thereby creating room for further borrowings to enhance economic growth of the country.

Inflation rate which is used as a control variable turned out negative and insignificant amidst government expenditure on pension and gratuity as well as expenditures on debt servicing. This implies that rising domestic price is unfavourable to economic growth. High rate of inflation reduces the purchasing power of money, thus affecting the real value of domestic production. The long-run estimate shows that an increase in inflation rate led to approximately 0.191056 decline in economic growth in Nigeria. The positive and significant

coefficient of the constant (C) indicates that the Nigerian economy would maintain a positive and consistent growth in the long-run when the explanatory variables (LNGEXPGR, LNGEXPDS and LNINFR) are held constant.

#### Auto Distributive Regressive Lag (ARDL): Short-run estimates

This section examines the degree of adjustment back to equilibrium using the error correction term. The short-run adjustment mechanism is measured by the error correction term  $ECM_{t-1}$  and it indicates how rapidly variables adjust to a shock and return to equilibrium. For stability to be observed, the coefficient of  $ECM_{t-1}$  should carry the negative sign and be statistically significant. It also ascertains whether the changes and statistical significance observed in the long-run also exist in the short-run. The ECM and short-run dynamics are presented in Table 6:

**Table 6: Error correction and short-run estimates**

| Variable           | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------------|-------------|------------|-------------|--------|
| D(LNGDP(-1))       | 0.120737    | 0.148042   | 0.815559    | 0.4260 |
| D(LNGDP(-2))       | 0.566643    | 0.154872   | 3.658782    | 0.0019 |
| D(LNGDP(-3))       | -0.346182   | 0.141637   | -2.444142   | 0.0257 |
| D(LNGEXPGR)        | 0.069682    | 0.017616   | 3.955686    | 0.0010 |
| D(LNGEXPGR(-1))    | -0.095618   | 0.028052   | -3.408528   | 0.0033 |
| D(LNGEXPGR(-2))    | -0.073030   | 0.023807   | -3.067614   | 0.0070 |
| D(LNGEXPDS)        | 0.058507    | 0.032886   | 1.779091    | 0.0931 |
| D(LNGEXPDS(-1))    | -0.180177   | 0.043078   | -4.182610   | 0.0006 |
| D(LNGEXPDS(-2))    | -0.066723   | 0.049606   | -1.345059   | 0.1963 |
| D(LNGEXPDS(-3))    | -0.059158   | 0.040247   | -1.469849   | 0.1599 |
| D(LNGEXPDS(-4))    | -0.140980   | 0.036096   | -3.905687   | 0.0011 |
| D(LNINFR)          | -0.025524   | 0.025161   | -1.014439   | 0.3246 |
| D(LNINFR(-1))      | 0.074141    | 0.017110   | 4.333232    | 0.0005 |
| ECM(-1)            | -0.284999   | 0.062650   | -4.549041   | 0.0003 |
| R-squared          | 0.854910    |            |             |        |
| Adjusted R-squared | 0.765093    |            |             |        |
| F-statistic        | 41.73291    |            |             |        |
| Prob(F-statistic)  | 0.000000    |            |             |        |
| Durbin-Watson stat | 1.952386    |            |             |        |

**Source:** Author's computation using E-Views 10.0

As reported in Table 6, the estimated coefficient of the ECM is negative and statistically significant as expected. This shows that deviations from LNGDP (measure of economic growth) equilibrium path are corrected by approximately 28 per cent over the following year. The statistical significance of the ECM emphasizes the presence of long-run

equilibrium connections between economic growth, government expenditures on pensions and gratuity, expenditure on debt servicing and inflation rate in Nigeria.

The Adjusted R-squared is 0.765093, this implies that the independent variables (LNGEXPGR, LNGEXPDS and LNINFR) explained about 76 per cent variations in LNGDP, while the remaining 24 per cent were other factors affecting changes in economic growth but were not captured in the current model. Additionally, the F-statistic of 41.73291 is statistically significant at 1 per cent level; this implies that LNGEXPGR, LNGEXPDS and LNINFR collectively explain variations in economic growth in Nigeria. The lagged coefficients of LNGDP shows that current year's was dependent on its past values after 2 and 3 periods lag.

The short-run estimate of government expenditure on pension and gratuity, denoted as  $D(LNGEXPGR)$  is positive and significant. This implies that the impact of LNGEXPGR on LNGDP was instantaneous. On the other hand, the lagged impact of LNGEXPGR on LNGDP was found to be negative and significant, indicating that the subsequent impact of government expenditure on pension and gratuity did not drive economic growth. This also shows that the impact of government expenditure on pension and gratuity on economic growth varied with time.

The short-run estimate of LNGEXPDS, denoted by  $D(LNGEXPDS)$  was positive and insignificant which implies that the impact of government expenditure on debt servicing did not occur immediately. The various lags of LNGEXPDS were found to be negative, thus indicating the expected undesirable effect of debt servicing over time. Especially, for the lags 1 and 4, it is seen that government expenditure on debt servicing was significantly negative, indicating that with the passage of time increase in debt servicing results in poor economic status.

Amidst the short-run impacts of government expenditures, inflation rate exerted a negative but non-significant impact on the economy. The short-run coefficient of inflation, denoted by  $D(LNINFR)$  shows that the immediate effect of rising inflation rate reduced economic growth. However, after a period lag, its effect turned positive and significant which indicates that the effects of inflation were time varying.

## Conclusions and Recommendations

### Findings of the Study

The following findings are made in this study:

1. Government expenditure on pensions and gratuities and debt servicing had positive and significant impact on economic growth of Nigeria in the long-run.
2. In the short-run, government expenditure on pensions and gratuities had a positive and significant impact on economic growth of Nigeria, while public debt servicing was found to be positive and non-significant.
3. Inflation exerted a negative and non-significant impact on economic growth in both the short and long-run.

**Conclusion**

This study contributes to the research effort at empirical measure of the impact of government expenditure on pensions and gratuity, and public debt servicing on economic growth in Nigeria for the 1981 - 2020 period. Prior empirical works shows that researchers are yet to reach a consensus on the subject. Therefore, the effect is yet to be well established. Data analysis based on the ARDL technique led to the conclusion that a long-run relationship exists between government expenditures on pension and gratuity, and public debt servicing and economic growth, and that government expenditures on pension and gratuity, and public debt servicing impact positively and significantly on economic growth off Nigeria in the long-run. From the short-run results, it was concluded that government expenditures on pension and gratuity exerts immediate impact on economic growth while the impact of public debt servicing was non-significant.

**Recommendations**

In the light of the researcher's findings, the following recommendations are presented:

1. The government of Nigeria should sustain and even improve budgetary allocation for pension and gratuity to guarantee minimal comfort among pensioners which would contribute to economic growth.
2. Government should ensure that any debt both internal and external debt should be a deal that opens Nigeria to greater trade and investment towards stimulating economic growth of the country which would in turn generate adequate funds for debt servicing.

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## APPENDIX I

**Data on nominal values of RGDP, GEXPGR, GEXPDS (N'Billions) and INFR**

| YEAR | RGDP     | GEXPGR | GEXPDS  | INFR  |
|------|----------|--------|---------|-------|
| 1981 | 15258.00 | 0.27   | 1.30    | 20.9  |
| 1982 | 14985.08 | 0.39   | 1.92    | 7.7   |
| 1983 | 13849.73 | 0.24   | 1.15    | 23.2  |
| 1984 | 13779.26 | 0.43   | 2.12    | 39.6  |
| 1985 | 14953.91 | 0.51   | 2.49    | 1.0   |
| 1986 | 15237.99 | 0.73   | 3.57    | 13.7  |
| 1987 | 15263.93 | 0.2    | 4.46    | 9.7   |
| 1988 | 16215.37 | 1.12   | 10.01   | 61.2  |
| 1989 | 17294.68 | 1.11   | 15.25   | 44.7  |
| 1990 | 19305.63 | 1.69   | 28.45   | 3.6   |
| 1991 | 19199.06 | 2.03   | 32.48   | 23.0  |
| 1992 | 19620.19 | 20.87  | 28.39   | 48.8  |
| 1993 | 19927.99 | 4.14   | 88.38   | 61.3  |
| 1994 | 19979.12 | 3.56   | 58.35   | 76.8  |
| 1995 | 20353.2  | 5.38   | 67.58   | 51.6  |
| 1996 | 21177.92 | 4.37   | 74.38   | 14.3  |
| 1997 | 21789.1  | 2.66   | 81.53   | 10.2  |
| 1998 | 22332.87 | 3.02   | 79.15   | 11.9  |
| 1999 | 22449.41 | 6.98   | 64.95   | 0.2   |
| 2000 | 23688.28 | 19.89  | 144.97  | 14.5  |
| 2001 | 25267.54 | 34.7   | 178.17  | 16.5  |
| 2002 | 28957.71 | 57.08  | 163.81  | 12.2  |
| 2003 | 31709.45 | 34.22  | 363.51  | 23.8  |
| 2004 | 35020.55 | 73.16  | 387.19  | 10.0  |
| 2005 | 37474.97 | 84.75  | 397.39  | 11.6  |
| 2006 | 39995.5  | 102.81 | 257.16  | 8.5   |
| 2007 | 42922.41 | 107.55 | 220.6   | 6.6   |
| 2008 | 46012.52 | 138.96 | 386.36  | 15.1  |
| 2009 | 49856.1  | 208.53 | 314.39  | 13.9  |
| 2010 | 54612.26 | 187.12 | 433.45  | 11.8  |
| 2011 | 57511.04 | 144.18 | 589.02  | 10.3  |
| 2012 | 59929.89 | 163.32 | 758.54  | 12.0  |
| 2013 | 63218.72 | 149.75 | 877.05  | 7.96  |
| 2014 | 67152.79 | 185.78 | 956.23  | 7.98  |
| 2015 | 69023.93 | 217.86 | 1108.01 | 9.55  |
| 2016 | 67931.24 | 194.41 | 1473.13 | 10.33 |
| 2017 | 68490.98 | 203.37 | 1884.54 | 10.98 |
| 2018 | 69799.94 | 214.79 | 2244.49 | 11.62 |
| 2019 | 71387.83 | 334.15 | 2584.85 | 12.50 |
| 2020 | 72975.72 | 453.51 | 2925.21 | 13.75 |

**Source:** CBN Statistical Bulletin (Various)