Government Expenditure, Tax Revenue, and Economic Growth: Empirical Evidence from Nigeria

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Abstract

This paper investigated the relationship between government expenditure, tax revenue, and economic growth in Nigeria using the autoregressive distributed lag (ARDL) model. The study utilized time series data from 1981 to 2022. The data analysed were collected on gross domestic product growth rate as the dependent variable, government expenditure, tax revenue, trade openness, and inflation as independent variables. The result of the findings revealed that both government expenditure and tax revenue had no significant impact on economic growth in Nigeria as they failed the significance test at 5 percent level. The results of the study confirmed that Nigeria's economy is yet to harness the much-expected benefits of fiscal policy. The study recommended that the Nigerian government should spend tax revenue on productive projects that could promote economic growth in Nigeria thereby promoting the well-being of Nigerians. It further recommended that Nigeria needed to intensify and formulate stable economic policies capable of promoting higher tax revenue collection.

Keywords: economic growth, tax revenue, government expenditure, ARDL & JEL Classification.

Introduction

The economic growth of any country depends on the amount of public revenue generated and the proportion of it channeled towards development. Most countries generate a sizeable amount of revenue from taxes to support government spending. Taxes are an authentic source of government revenue that helps in achieving the socio-economic, political, and macroeconomic objectives of any country (Osamor, Omoregbee, Ajasa-Adeoye & Olumuyiwa-Loko, 2023). In Africa and other continents, taxes have been one of the most dependable sources of funds for government expenditure (Horton & El-Ganainy, 2023). It has become imperative to investigate the effects of government expenditure and tax revenue on economic growth.

The Keynesian, neoclassical, and endogenous growth theories revealed the relationship between taxes, government expenditure, and economic growth. According to Karagianni *et al* (2012), in neoclassical economic growth models, taxes impact economic growth temporarily, whereas in endogenous models, taxes affect growth in the long term. Meanwhile, in the Keynesian growth model, the impact of government expenditure on economic growth is recognized on the basis of aggregate demand (Sen & Sagbas, 2017).

Keynes expressed the importance of government expenditure in determining economic growth, and the hypothesis that government expenditure is the cause of economic growth has been tested in studies whose authors followed this school of thought. Meanwhile, the expressions of the classical and neoclassical theories on the subject will, of course, lead to the problem of the financing of these expenditures as well as the fact that government expenditures are made more than necessary due to the understanding of the minimal state. To manage this problem, the state's

first solution would be to increase taxes and the second solution would be borrowing. In both cases, certain people and entrepreneurs would be adversely affected (Odubuasi, Ifurueze & Ezeabasili, 2020).

The size of government in Nigeria has continued to rise on yearly base from 1960 to 2022. Public sector economics holds that the size of government has a direct relation with economic growth. A question of great interest not only from an academic point of view but also from an economic policy perspective relates to the impact of government expenditure and tax revenue on economic growth in Nigeria. A number of empirical studies (Udo, Ekere & Enebeghe, 2022; Aluthge, Jibir & Abdu, 2021; Odubuasi, Ifurueze & Ezeabasili, 2020; Gurdal1, Aydin & Inal, 2019; Omar, Nazatul & Ali, 2018) have examined the impact of government expenditure and tax revenue on economic growth in Nigeria. The results of the studies are mixed. The variation in the empirical results warrants further research into the relevance of government expenditure and tax revenue in promoting growth in Nigeria.

The purpose of this study is to provide further evidence for policy formulation and implementation to promote economic growth in Nigeria. The current study wholly focused on government expenditure, tax revenue and economic growth in Nigeria. Some studies examined government expenditure and growth and others tax revenue and growth.

The rest of the study is organized as follows: In the second section, we summarized the related literature; in the third section, we introduced the data and methodology; in the fourth section, we explained the empirical results; and, in the last section, we interpreted the results and made policy recommendations.

Review of Literature

This section describes the conceptual, theoretical and empirical literature relating to this study. The three concepts; government expenditures, tax revenue and economic growth are identified and discussed in the following sub-sections.

Government Expenditure

Government expenditure is the total sum of money a government spends to finance its activities and functions as planed or unplanned. Government expenditure usually tends to increase with time as the economy becomes larger and more developmental activities are required (Frank & Kereotu, 2020). Taiwo (2012) emphasizes that government spending is a fiscal instrument which serves a useful role in the process of controlling inflation, unemployment, depression, balance of payment equilibrium and foreign exchange rate stability. In Nigeria, the federal government's expenditures are broadly divided into capital and recurrent expenditure. The recurrent expenditure consists of government expenditure on administration such as wages, salaries, interest on loans, maintenances, amongst others. The capital expenditure is on projects like roads, airport, health, education, electricity generation, telecommunication, water amongst others (Ogboru, 2010).

Tax Revenue

Tax revenue is the sum of money the government generates from taxes imposed on individuals, enterprises, companies, trade amongst others. Taxes are classified into direct and indirect taxes. The distinction between the two is a matter of the awareness of the taxpayer of incidence of a particular tax. Direct taxes are paid directly to the government and cannot be transferred to another

taxpayer. Indirect taxes are paid indirectly to the government and can be pass-on from one person to another. Among the many sources of government revenue, tax revenue is the most reliable and important financial source for governmental public expenditures (Frecknall-Hughes, 2014).

Economic Growth

Economic growth refers to sustained increase in inflation-adjusted gross domestic product (market value of goods and services produced in a country) over time. Conventionally, it is measured as the percentage increase in real gross domestic product (GDP). This measure of growth is quite prominent in growth theories such as the Solow growth model and the endogenous growth theory among others (Ashakah & Wanogho, 2021). This measure has been used in numerous empirical growth studies (Barro, 1996; Agosin, 2007; Hamed, Hadi & Hossein, 2012; Adamu, Ighodaro & Iyoha, 2012).

Theoretical Framework

There are various theories that indicate the relationship between government expenditure, tax revenue and economic growth. The traditional tax theory is one of the theoretical approaches to tax application. The traditional tax theory holds that there are general purposes that should be served by the tax system. The general purposes can be broken down into seven categories:

i. to finance government recurrent and capital expenditures;
ii. to achieve a concrete and practicable income tax system;
iii. to promote stability and sustainable economic growth;
iv. to impose equal taxes upon those who enjoy equal incomes;
v. to reduce economic inequality;
vi. to minimize interference with the operation of an efficient economic system and
vii. to develop a tax system consistent with the Constitution and the Political system (Schurtz, 1986). The 3rd general purpose holds that taxation aims to achieve stability and economic growth in the country.

The Keynesians hold firmly that an increase in government expenditure has the potential to increase the economic growth of nations. They believed that an increase in government expenditure (an exogenous factor) results in rising aggregate demand, which culminates in more output, income, and employment (Jhingan, 2002). The size of government is believed to have a direct relationship with the economic growth of nations. Certain factors such as population growth, rising prices, and emergencies among others are judged to be responsible for the increase in government expenditure. Increase in government expenditure leads to economic growth (Ganti and Kolluri, 1979; Georgakopoulos & Loizides, 1994).

Government expenditure, Tax Revenue and Economic growth

Gurdal1, Aydin and Inal (2019) examined the relationship between tax revenue, government expenditure, and economic growth that existed in Canada, France, Germany, Italy, Japan, UK, and the USA—the G7 countries using annual data from 1980 to 2016 using two different panel causality approaches in order to make a comparison. The finding from the time domain panel causality test results proved there was a bidirectional causality between economic growth and government expenditure but unidirectional causality between tax revenue and government expenditure. There was no causal relationship between economic growth and tax revenue. The

frequency domain causality results showed that there were bidirectional short- and long-run causality between economic growth and tax revenue, and long-run causality between economic growth and government expenditure.

Omar, Nazatul and Ali (2018) investigated the effect of taxes and government expenditures on economic growth in Jordan using a time series data for the period 1970-2017 by estimating Autoregressive Distributive Lag (ARDL) model. The study found that the taxes and government expenditure at the aggregate level had significant positive impact on economic growth in Jordan.

Folster and Magnus (1998) examined the growth effect of government expenditure and Taxation in rich countries focusing on 23 of the Organization for Economic Cooperation and Development (OECD) countries. They employed the Cross-country OLS Regression analysis on panel data covering 1970 to 1995. The result of data analysis showed that government expenditure and taxation failed to impact growth positively in OECD countries.

Government Expenditure and Economic Growth

Udo, Ekere and Enebeghe (2022) employed modified and extended aggregate production model to examine the effects of government expenditure at its' aggregate level on economic growth in Nigeria for the period (1981-2018) using bound test (ARDL) approach to examine the effect of government expenditure on economic growth in Nigeria. The findings showed that government expenditure impacted growth positively in Nigeria. It was recommended that there should be proper utilization of public fund in the provision of security and critical infrastructure especially electricity supply and road infrastructure which were highly needed for effective economic performance.

Aluthge, Jibir and Abdu (2021) investigated the impact of Nigerian government expenditure on economic growth using time series data for the period 1970-2019. They employed Autoregressive Distributed Lag (ARDL) model in data analysis. The findings showed that capital expenditure had positive and significant impact on economic growth both in the short run and long run while recurrent expenditure does not have significant impact on economic growth both in the short run and long run. The study recommended that government should increase the share of the capital expenditure especially on meaningful projects that would have direct bearing on the citizen's welfare.

Okpabi, Ijuo, and Akiri (2021) examined the impact of government expenditure on economic growth in Nigeria for the period, 1984 - 2015 using Johansen co-integration and Error Correction Model. The empirical results showed that government expenditure had significant positive impact on the growth of the economy in the long run and an insignificant negative impact on the Nigerian economy in the short run. The study recommended that Nigerian government should readjust spending priority to accommodate more capital expenditure and channeling of increase expenditure into some critical sectors of the economy such as health, power, education and general infrastructure.

Odubuasi, Ifurueze and Ezeabasili (2020) evaluated the effect of government expenditure on economic growth in Nigeria using time series data of 15 years (2004-2018) using the Autoregressive Distributed Lagged (ARDL) testing technique and Error Correction Model-based, Granger Causality, unit root test, and cointegration to examine the long run causal effect relationship that existed between government expenditure and economic growth in Nigeria. The

study found that government expenditure on highway, and expenditure on safety has positive significant effect on economic growth in Nigeria at 5% and 1% levels respectively, government recurrent expenditure had positive and no statistical significant on economic growth, while government expenditure on education had negative and no significant effect on the economic growth in Nigeria. The study recommended among others that Government should increase its expenditure on capital project as this would provide the needed infrastructure that could enhance the private sector productivity thereby improving economic growth.

Tax Revenue and Economic Growth in Nigeria

Osamor, Omoregbee, Ajasa-Adeoye, and Olumuyiwa-Loko (2023) examined the effects of tax revenue on economic growth in Nigeria. Tax revenue was a proxy with PPT, CIT, VAT and CTD, while economic growth was proxy with GDP by employing ARDL bound test approach on annual data spanning 2011 to 2020. The findings revealed that PPT, CIT, VAT and CTD had positive insignificant effects on economic growth. The study concluded that tax revenue had insignificant effects on the economic growth of Nigeria and therefore, recommended that proper tax audit should constantly be carried out to reduce tax evasion and avoidance.

Edori (2022) examined the impact of tax revenue on Nigeria's economic growth using CIT, VAT and PPT as referents for tax revenue and GDP for economic growth from 2008 to 2017. The least squared technique and the Granger Causality Test were employed in estimating the equilibrium relationship and the cause and effect relationship between tax revenue and economic growth in Nigeria. It was found that a positive but insignificant relationship existed between tax revenue and economic growth in Nigeria. The study concluded that poor management of tax revenue accounted for the insignificant relationship and then recommended that the government should efficiently and effectively manage tax revenue to ensure economic growth.

Ashibogwu, Abogbanwa-Eyimofe, and Toneradu (2022) examined the impact of tax revenue on economic growth in Nigeria by employing Autoregressive Distributed Lag bounds testing approach covering a period of 2011-2020. The study found that the trends of tax revenue were unstable with tertiary education tax. Also, the study found that economic growth had long-run significant relationship with tax revenue components. In the short run, economic growth was significantly and positively responsive to changes in company income tax by 0.13%, value added tax by 0.07% and tertiary education tax by 0.25% contrary to its 0.43% negative response to changes in petroleum profit tax. It was recommended that conducive environment such as improved security, affordable leading rate and basic infrastructures that made investment to thrive should be provided to promote economic growth.

Nwachukwu, Nwoha and Inyama (2022) examined the effect of taxation on the economic growth in Nigeria using the Ordinary Least Squares (OLS). The result of the study indicated that value added tax, petroleum profit tax, personal income tax and company income tax have positive and significant effect on gross domestic product in Nigeria. The study recommended that tax collection mechanism must be free from corruption and embezzlement.

The empirical literature reviewed showed mixed effects of government expenditure and tax revenue on economic growth in Nigeria. It became relevant to carry out this study to collectively examine the effects of government expenditure and tax revenue on economic growth in Nigeria.

Methodology

In order to investigate the link between government expenditure, tax revenue and economic growth, the empirical model for this study was specified based on the specification of Omar, Nazatul and Ali (2018) with little modification.

Model Specification

The empirical model for the study is specified as follows:
$$GDPGR = f[GOVX, VAT, TON, INFL]\text{---(1)}$$
The above function can be specified in econometric form as follows
$$GDPGR = \beta_0 + \beta_1 GOVX + \beta_2 VAT + \beta_3 TON + \beta_4 INFL + \varepsilon \text{ ------------------------------(2)}$$
Equation 2 above can be stated in ARDL form as follows
$$\Delta GDPGR_t = \beta_0 + \beta_1 GDPGR_{t-i} + \beta_2 GOVX + \beta_3 VAT + \beta_4 TON + \beta_5 INFL +$$
$$\sum_{j=1}^{p} \gamma_1 \Delta GDPGR_{t-1} + \sum_{j=0}^{p} \gamma_2 \Delta GOVX_{t-1} + \sum_{j=0}^{p} \gamma_3 \Delta VAT_{t-1} + \sum_{j=0}^{p} \gamma_4 \Delta TON_{t-1} +$$
$$\sum_{j=0}^{p} \gamma_5 \Delta INFL_{t-1} + \emptyset ECM_{t-1} + \varepsilon_t \text{ --------------------------------------- (3)}$$
Where GDPGR is gross domestic product growth rate, GOVX denotes government expenditure, VAT represents tax revenue, TON denotes trade openness and INFL is inflation. t-i stands for time lags, β_{0-5} represents the parameters to be estimated while ε stands for the error term (other variables that affect the dependent variable but not included in the model). Trade and inflation are included in the model as control variables. The a priori expectation of the independent variables is greater than zero, except inflation. In order words, we expect government expenditure, tax revenue and trade to impact economic growth positively in Nigeria. Inflation is expected to have a negative influence on growth in Nigeria.

Data Sources and Description of variables

The annual data covering from 1981 to 2022 was sourced from the Central Bank of Nigeria Statistical Bulletin and the World Bank Development Indicator (2022). The scope of the study is determined by the availability of data on the variables. The variables used in this study are GDP growth rate as the dependent variable, while government expenditure, tax revenue, trade openness and inflation are used as independent variables. Data on GDP growth rate, government expenditure, tax revenue, trade openness were sourced from World Bank Development Indicator (2022) while data on inflation was sourced from the Central Bank of Nigeria Statistical Bulletin (2022).

Method of data Analysis

The Autoregressive Distributed Lag (ARDL) model was employed in data analysis. The choice of the autoregressive distributed model was informed by the nature of the data for the study (Iheonu & Nwakeze, 2016; Ogbuabor, Agu, Odo & Nchege, 2017; Onyema, 2020). The data failed to follow same order of integration. Prior to the estimation of the ARDL model, we performed preliminary data analysis to ascertain the stationarity status and confirm if long run relationship existed among the variables for the study. We employed two-unit root tests (ADF & PP) in the study. The ARDL bounds cointegration test was applied to determine the existence of a long run relationship among the variables. Some diagnostics tests (stability test and serial correlation tests) were carried out to evaluate the goodness of the estimated model.

Empirical Results and Discussion

This section presents the empirical results of data analysis and discussion.

Descriptive Statistics

The descriptive statistics describe the variables in terms of their averages, maximum values, minimum values, standard deviation, skewness, kurtosis, J.B and probabilities to ascertain if the variables are normally distributed or not.

Table 1: Descriptive Statistics of the variables

Variable	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis	J.B	Prob.	Observ.
GDPGR	3.041468	15.32915	-13.12788	5.385440	-0.819168	4.620614	9.0722	0.0107	41
GOVX	2494.307	12164.15	9.636500	3189.896	1.406514	4.206007	16.003	0.0003	41
VAT	167.6874	969.4089	0.000000	232.4277	1.548653	5.010495	23.294	0.0000	41
TON	31.67463	53.27796	9.135846	12.42937	-0.260245	2.128483	1.7604	0.4147	41
INFL	18.94905	72.83550	5.388008	16.65937	1.854161	5.306526	32.581	0.0000	41

Source: Authors' Computation using Eviews 12

Looking at Table 1, the growth rates of real gross domestic product lied between 15.32915 and -13.127788. The standard deviation was 5.385440 and the average growth rate was 3.041468 from 1981 to 2022. The coefficient of skewness, kurtosis and the Jarque-Bera statistic with a probability of 0.0107 indicated that the variable failed to follow a normal distribution. Government expenditure ranged between 12164.15 and 9.636500, in billions of naira. The standard deviation was 3189.896 and the average rate was 2494.307 from 1981 to 2022. The coefficient of skewness, kurtosis and the Jarque-Bera statistic with a probability of 0.0003 indicated that the variable failed to follow a normal distribution pattern. Similar explanation goes for tax revenue and inflation. Trade openness ranged between 53.27796 and 9.135846. The standard deviation was 12.42397 and the average percent was 31.67463 from 1981 to 2022. The coefficient of skewness, kurtosis and the Jarque-Bera statistic with a probability of 0.4147 indicated that the variable followed a normal distribution pattern. Majority of the variables considered for this study are not normally distributed based on the coefficient of skewness, kurtosis and the Jarque-Bera statistics with probability values which are less than 5 per cent.

Unit Root Tests

Table 2: Summary of Unit Root Tests

Variable	ADF (Probabilities) Level	ADF (Probabilities) 1st. Difference	Phillips –Perron/ (Probabilities) Level	Phillips –Perron/ (Probabilities) 1st. Difference	Remark
GDPGR	-3.203694 (0.0271)	N/A	-4.333019 (0.0013)	N/A	I(0)
GOVX	5.675380 (1.0000)	-5.337581 (0.0006)	6.371339 (1.0000)	-3.49544 (0.0134)	I(1)
VAT	5.366159 (1.0000)	-3.241741 (0.0269)	5.266672 (1.0000)	6.45593 (0.0000)	I(1)
TON	-2.378352 (0.1541)	-7.759925 (0.0000)	-2.283312 (0.1821)	-2.3783 (0.0225)	I(1)
INFL	-2.916853 (0.0521)	N/A	-2.916853 (0.0521)	N/A	I(0)

Note: Probabilities in parenthesis. N/A- not applicable
Source: Authors' Computations using Eviews 12

Looking at Table 2, the variables considered for the study were not integrated in same order. The two-unit root tests (ADF and PP) employed showed that inflation and gross domestic product growth rate were stationary at level while the other three variables (government expenditure, tax

revenues and trade openness) were not. Government expenditure, tax revenues and trade openness became stationary after taking their first difference. Following the differences in the order of integration found in the variables, it appeared unnecessary to proceed with the traditional cointegration tests and cointegration estimations (Eagle & Granger, 1987; Maddala & Kim, 1998; Stock & Watson, 1993). By the features of the variables, the ARDL approach appeared more appropriate.

Test of Cointegration

Table 3: ARDL Bounds Cointegration Test

Function	F- Statistics	Results	
GDPGR C GOVX, TAX, TON, INFL	7.617650*		Cointegration
Critical Value Bounds	1%	5%	10%
I(0)	3.29	2.56	2.20
I(1)	4.37	3.49	3.09

Note: *level of significance at 5%
Source: Authors Compilation using EViews 12

The result of the cointegration test, based on the ARDL bound testing approach as presented in Table 3. The ARDL bounds cointegration testing approach is employed to test for cointegration in a case where the variables for the study are integrated in mix order (Narayan & Smith, 2005). The results showed that the F-statistic (7.617650) is higher than the upper bound critical value at the 5% level of significance. The hypothesis of no long-run relation was rejected (Andohol, Doki, & Ojiya, 2020; Anumudu, Ugwuanyi, Asogwa & Ogbuakanne, 2018; Ashakah & Wanogho, 2021). This indeed indicated that all the selected independent variables and real GDPGR were bounded by a long run relationship.

Long Run Coefficient Estimates

Table 4: Long run coefficients
Dependent variable: GDP Growth Rate
Model selection Method: AIC
Selected Model: ARDL (1, 0, 2,1,4)

Independent Variables	Coefficient	Std. Errors	t- Statistic	Probabilities
C	6.303327	2.385700	2.642129	0.0143
GDPGR(-1)	-0.103465	0.176838	-0.585085	0.5640
GOVX	-0.001364	0.001223	-1.115553	0.2757
VAT	0.009007	0.021753	0.414074	0.6825
VAT(-1)	0.062477	0.046438	1.345393	0.1911
VAT(-2)	-0.067743	0.034586	-1.958657	0.0619
TON	0.006903	0.072490	0.095230	0.9249
TON(-1)	0.122164	0.064948	1.880942	0.0722
INFL	-0.100905	0.044339	-2.275750	0.0321**
INFL(-1)	0.035713	0.059327	0.601965	0.5528
INFL(-2)	-0.053584	0.062061	-0.863415	0.3965
INFL(-3)	-0.024886	0.056367	-0.441501	0.6628
INFL(-4)	-0.78328	0.044771	-1.749548	0.0930
	R-Squares:	0.57537		
	D.W:	2.306592		
	Prob.(F-Statistic):	0.018165		

Note: ** represent level of significance at 5 %
Source: Authors Compilation using E-Views 12

From the long run model estimation result presented in Table 4, the value of the coefficient of determination (R- Squared) is 0.57; indicating that about 57% of the systematic variation in gross domestic product growth rate is captured by the explanatory variables included in our model. The remaining 43% is accounted for by other variables not included in the model. The F-statistic with a probability value of 0.018165 indicates that a significant relationship exists between GDPGR and the explanatory variables included in the model. The value of Durbin Watson (DW) statistic of 2.306595 suggests that that there were no effects of autocorrelation in the estimated model. This makes our result reliable for policy decision making.

The individual effect of the explanatory variables on the dependent variable is determined based on the coefficients and p-value of the variable. The result shows that the coefficients of the first lag of gross domestic product growth rate (GDPGR) and government expenditure (GOVX) were estimated at -0.103465 and -0.001364. Both had negative sign but failed to impact economic growth in Nigeria as the coefficients failed to pass the significance test at 5% level. The coefficients of tax revenue (VAT) and its first lag estimated at 0.009007 and 0.062477, both had positive sign but failed to impact economic growth in Nigeria as the coefficient failed to pass the significance test at the 5% level. The coefficients of trade openness and its first lag were estimated at 0.006903 and 0.122164. The results showed that trade openness impacted growth positively in Nigeria, but failed to pass significance test at the 5% level. Carefully looking at the table 4, the coefficient of inflation estimated at -0.100905 impacted growth negatively in Nigeria at the 5% level of significance. It first to forth lag failed to impact growth.

It is clear from our results that Nigeria's growth rate is yet to be impacted positively and significantly by government expenditure and tax revenue as found by some empirical studies (Okwara & Amori, 2017; Edori, 2022; Ashibogwu, Abogbanwa-Eyimofe & Toneradu, 2022).

Short Run Adjustment and Impact

Table 5: ECM representation of the ARDL model
Dependent variable: D(RGDPGR)
Selected Model: ARDL (1,1,1,1)

Independent Variable	Coefficient	Std. Errors	t-statistics	Probabilities
C	6.303327	2.385700	2.642129	0.0143
D(GOVX)	-1.103465	0.001223	-1.115553	0.2757
D(VAT)	0.009007	0.015110	0.596129	0.5567
D(TON)	0.006903	0.053918	0.128033	0.8992
D(INFL)	-0.100905	0.035944	-2.807254	0.0098***
ECM(-1)	-1.103465	0.148484	-7.431552	0.0000***
	R-Squares:	0.692725		
	D.W :	2.3065		
	Prob(F-Statistic) :	0.001697		

Note: *** level of significance at 1 %
Source: Authors Compilation using EViews 12

Table 5 presents the error correction estimate of the ARDL model. The coefficient of the ECM variable is found to be negative and statistically significant at 1% level confirming the existence of long run relationship among the variables used in the study. The coefficient of ECM for the cointegrating equation with ΔGDPGR as the dependent variable showed a very high speed of adjustment back to equilibrium position, with about 100% of disequilibrium in the previous year returning to the long run equilibrium in the current year. The estimated coefficients of government

expenditure, tax revenue, and trade openness in the short run estimate (error correction model) failed to pass the test of significance at both the 1 and 5% levels. The result shows that in the short run, government expenditure, tax revenue and trade openness have no insignificant impact on economic growth in Nigeria. Inflation impacted growth negatively and significantly at 1% level of significance, which is in line with the findings of Ogbebor and Ashakah (2021) and Ashakah and Ogbebor (2022).

Diagnostics and Stability Test

The Breusch-Godfrey Serial Correlation LM test was employed to test for the presence of serial correlation in the model. The SUCUM and SUCUM of Squares tests were used to test for the model stability:

Table 6: Breusch-Godfrey Serial Correlation LM test
Null Hypothesis: No Serial Correlation

F- Statistics	1.221284	Prob. F(2.22)	0.3141
Obs*R-Squared	3.697443	Prob. Chi-Square(2)	0.1574

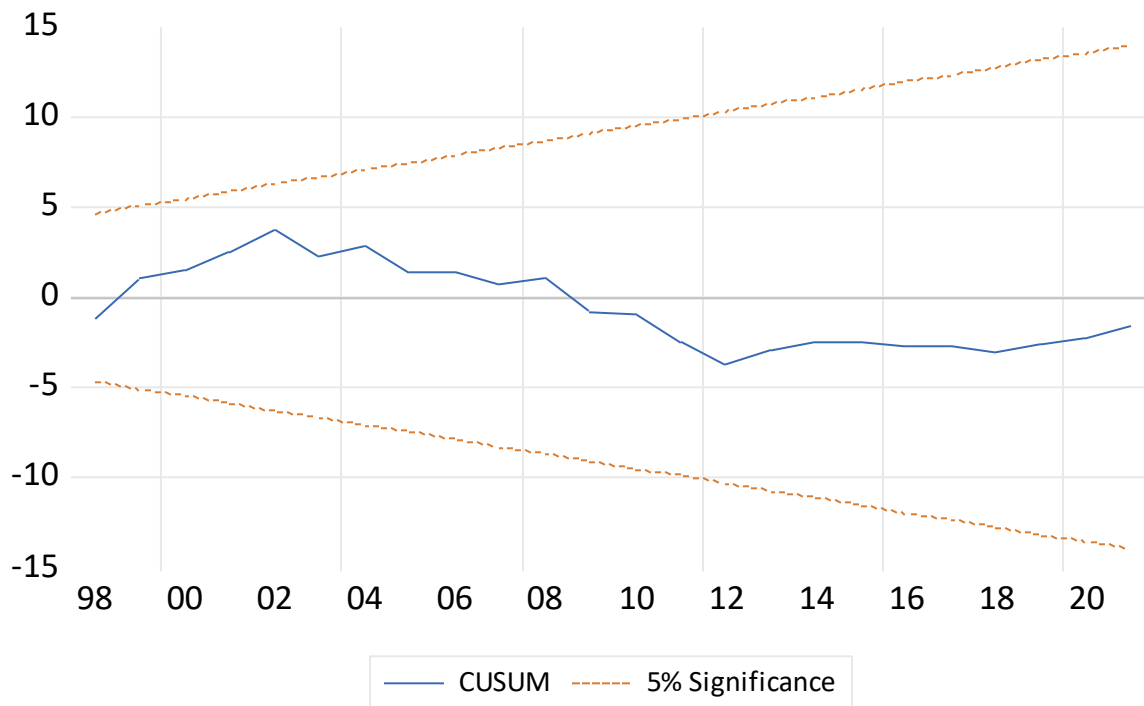*Source: Authors Compilation using EViews 12*

Figure 1: Plots of SUCUM Test
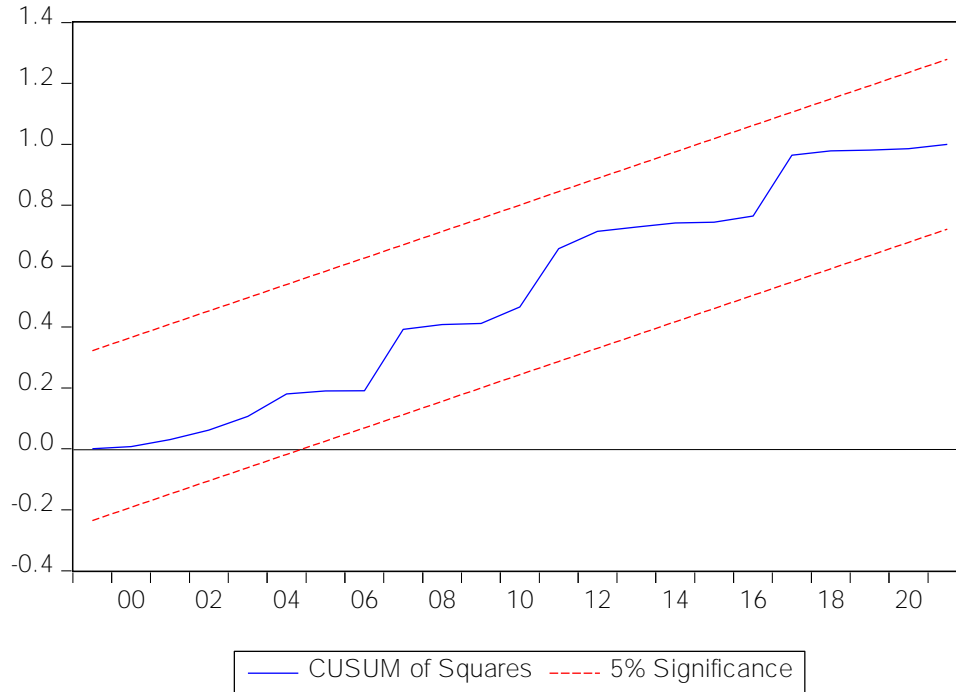*Source: Authors Compilation using EViews 12*

Figure 2: Plot of SUCUM Squares Test
Source: Authors Compilation using EViews 12

From the diagnostic test results, there was no evidence of serial correlation, it showed the model was well specified in the ARDL specification (see Table 6). The stability of the long-run coefficient was tested by the short-run dynamics. Once the ECM model given in table 5 had been estimated, the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests were applied to assess parameter stability (Pesaran & Pesaran, 1997). Figures 1 and 2 plotted the results for CUSUM and CUSUMSQ tests. The results showed the absence of any instability in the coefficients since the plot of the CUSUM and CUSUMSQ statistic fell inside the critical bands of the 5% confidence interval of parameter stability (Iheanacho, 2017).

Conclusion

This study has investigated the impact of government expenditure and tax revenue on economic growth in Nigeria using the autoregressive distributed lag (ARDL) model in data analysis. The study analysed time series data from 1981 to 2022. The data analysed were collected on gross domestic product growth rate as the dependent variable, government expenditure, tax revenue, trade openness, and inflation. The empirical results revealed that government expenditure and tax revenue were not positive growth factors in Nigeria as the coefficients of both government expenditure and tax revenue failed to pass the significance test at the level. The results further revealed that inflation is a strong growth determinant in Nigeria as the coefficient of inflation negatively passed the significance test at the 5% level. The results of the study confirmed that Nigeria's economy was yet to harness the much-expected benefits of government expenditure.

Recommendations

Based on the findings of the study, the following recommendations are made for policy formulation and implementation:

    i. The Nigerian government should spend tax revenue on productive projects that could promote economic growth in Nigeria thereby promoting the well-being of Nigerians.

   ii. The Nigerian government needs to intensify and formulate stable economic policies capable of promoting higher tax revenue collection to support government expenditure.

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