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Interaction Effect of Tax Revenue and Government Capital Expenditure on Economic Growth in Nigeria

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Abstract: This study examines the effect of fiscal components on economic growth in Nigeria, specifically investigating how tax revenue, government expenditure, and other related indicators influence economic growth using an Autoregressive Distributed Lag regression analysis spanning 33 years. The results reveal that tax revenue and government capital expenditure exert statistically significant negative effects on RGDP, respectively, highlighting potential constraints these factors impose on economic growth. Conversely, government recurrent expenditure and gross fixed capital formation demonstrate insignificant impacts. Notably, the interaction between tax revenue and government capital expenditure shows a positive and significant effect on RGDP, suggesting a beneficial interplay that warrants further exploration. Additionally, total debt obligations appear to have a negligible influence. The model's robustness was further affirmed by the significant constant term. The study, therefore, emphasizes the intricate dynamics of fiscal policy, emphasizing the need for strategic government interventions to foster economic growth. Since tax revenue and government capital expenditure individually impact RGDP negatively, optimizing these economic factors will enhance overall economic performance. Fiscal authorities can reconsider the current tax structures and

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government expenditure strategies. The study also recommends prioritization of investment in government capital projects, this will ensure that expenditures maximize productivity and yield substantial returns that will stimulate economic growth. Executing tax incentives that encourage productive sectors investments can leverage the positive and significant interaction effect between tax revenue and government capital expenditure, fostering a more conducive environment for economic development. At the instance of negligible influence of total debt obligations, a careful appraisal of borrowing strategies should be undertaken to ensure that debt accumulation supports growth-oriented projects rather than becoming a financial burden.

Keywords: ex-post facto; growth-oriented; infrastructure; RGDP; Wagner's theory

JEL Classification: E62, H54, H63

1. Introduction

Tax revenue has continuously seen a rise in importance as a source of revenue generation all over the world, Nigeria is no exemption. According to Oluwole (2023), the serious drop in oil prices, impact of the Ukraine-Russia war, and other international challenges have led to a decrease in the funds available to the Nigeria government, and it has become obvious that Nigeria's debt profile and oil revenue are no longer sufficient to support her growth and other macroeconomic objectives. With these problems, it has become an economic necessity for the government to generate sufficient level of revenue internally.

The promotion of economic growth and other macroeconomic objectives is facilitated by government expenditure on relevant infrastructural enhancements. However, despite the increases in the budget allocations to the development of infrastructure, there has not been a significant increase in the level of economic growth in the country. According to Okerekeoti (2022), the problem of economic growth in Nigeria appears to be linked to spending patterns, as significant expenditures have been made year after year, but the economy's performance has remained below target. This suggests that there is a lack of effectiveness in Nigeria's fiscal management.

A number of studies have examined individual effects of tax revenue and government expenditure on economic growth in Nigeria (Jideofor, Michah & Adanma, 2021; Etim & Nweze, 2020; Adefolake & Omodera 2022; Okerekeoti 2022). These studies have tried to capture the importance of tax revenue and government capital expenditure and its effects on the growth of the Nigerian economy. However, the Nigerian economy is yet to achieve the expected growth

rates that is expected of it and to the best of knowledge of the researchers there is paucity of studies that consider the interaction effect of revenue and expenditure components of fiscal policy administration on Nigeria economic advancement.

Considering these literature gaps that have been observed in the study of revenue and expenditure in the Nigerian economy, this study seeks to examine the interaction between these variables and how it affects the growth of the Nigerian economy under a dynamic model environment involving autoregressive distributed lag estimation process.

2. Literature Review

The word tax was derived from the Latin word ‘Taxo’, which means to charge. Tax has gone on to be defined in many ways. A tax could be defined as a compulsory financial charge, or some other type of levy imposed on a taxpayer (an individual or legal entity) by a governmental organization to fund public expenditure at all levels of government. The emphasis of this study will be based on tax revenue rather than tax. Tax revenue is the income accrued by government officials from the process of taxation. Taxation is the process by which these taxes are collected from individuals and organizations in the country. Capital expenditure on the other hand, are expenses incurred because of the maintenance or purchase of physical assets which include machinery, buildings, and/or technological equipment. Bergh and Henrekson (2011) observed that government capital expenditure is the expenses incurred by the government for the infrastructural development, the economy, and the society at large and taxation plays a key role in this revenue mobilization and capital expenditure financing.

The prime responsibility of every government is the adequate provision of goods and services which are key in the improvement of standards of living in their country (Adefolake & Omodera, 2022; Asaolu, Olabisi, Akinbode & Alebiosu, 2018). The government’s ability to provide these goods and services is directly related to the volume of revenue that can be generated. On the other hand, the standard of living attainable by the citizens of a country is a factor of the efficiency in provision of these goods and services. In past years, Nigeria has seen the continuous shortfall of revenue generated from tax because of factors such as tax evasion. This has adversely affected government’s expenditure planning due to an inadequate level of revenue which increased deficit to be funded through borrowing. The key role of

taxation is lacking in Nigeria. As observed in the work of Asaolu et al. (2018), the taxation system of the country is riddled with loopholes that make it hard to generate adequate revenue from taxes. The revenue of the country, over the past two decades, has been dominated by oil revenue which has reduced the role of taxes in providing revenue for the country. This has contributed to a reduction in the effectiveness of fiscal policies in the management of the economy.

According to Asaolu et al. (2018) tax payment has become a necessity of global importance because it is a significant source of revenue generation regardless of the country. Considering this, governments are expected to make informed decisions on how to tax and what income or goods should be taxed. Studies of Asaolu et al. (2018) and Adefolake & Omodera (2022) have stressed the fact that decisions on tax systems are made in consideration of expenditure which the government plans for in their budget preparations. This shows that taxes have influence on the volume of public expenditure, aggregate consumption, and the growth pattern of the economy at large. Government expenditure has continued to play an important role in the development of Nigeria.

Additionally, researchers have continued to emphasize the role of capital expenditure in economic growth and development through the stimulation of aggregate demand that brings about an increase in private investment in an economy. In past years, the government has adjusted its capital expenditure, either by increasing or reducing it to efficiently meet the country's growth needs and manage Nigeria's budget deficit. It has also adopted explicit target for its capital spending to monitor the fiscal situation and attain sustainable growth.

Jideofor, Okafor and Nmesirionye (2021) observed that the role of capital investment in the growth of the Nigerian economy has been a topic of discussion amongst various economists in recent years. The Wagner theory of increasing state operations, supported by Keynes's theory of deficit financing lend credence to an increase in government expenditure on public goods and services. The role of these theories in the Nigerian economy has however been yet to be proven useful with the incidence of government expenditure which is yet to reflect progress in the affairs of the Nigerian economy.

The goal of economic growth and development has, in recent years, pushed countries of various economic standings to embark on income growth activities to maximize revenue available to meet economic needs in the countries. The role of taxation in this income growth has continued to undergo scrutiny by researchers to deduce how

viable this source of income is for revenue generation. Studies have shown that taxes play a key role in revenue generation and are key in economic regulation. In Nigeria, the continuous issue of shortfall in tax revenue has continued to constrain public expenditure required to support economic growth.

The ineffectiveness of current tax policies and capital expenditure plans have been reflective on the state of the Nigerian economy. The aim of this study is to measure the level to which capital expenditure and tax revenue affect the Nigerian economy and give policy recommendations on how best the two factors can be used to achieve economic growth in the country.

Olaniyi, Mustapha and Oyedokun (2019) note the adverse effect of the unwholesome act of tax evasion and tax avoidance on the provision of public goods in Nigeria, which they suggested calls for urgent attention and solution. To ensure sustainable growth and development, therefore, calls for the replacement of foreign aid dependency with tax self-reliance by the poor and the emerging economies alike, in the long run (Ogbonna & Appah, 2012; Olaniyi, Mustapha & Oyedokun, 2019). In the views of Adegbe and Fakile (2011), the desire and opportunities for tax evasion and avoidance by the citizens are attributable to a lack of knowledge and education on the importance of tax revenue to economic progress. On this note, they assume and believe the role of communication, dialogue and building trust between the government and the governed on taxation matters becomes imperative (Osho, Olemiya & Falade, 2019).

Osho, Olemiya and Falade (2019) argue that government spending and economic growth move in either direction. This is hinged on the fact that while it is in no doubt that government spending stimulates economic growth, economic growth also stimulates government spending. This is because changes in economic growth rate determine changes in revenues that accrue to the government upon which government spending is equally based (Aguolu, 2004; Osho et al., 2019). In the same vein, Osmond, Nnamocha and Emmanuel (2015) argue that since a rise in public expenditure greatly depends on revenue collection, and revenue collection depends on the level of economic activities, it is logical to say that government expenditure depends on the level of economic activities.

3. Methodology

Ex-post facto research approach was utilized. An ex-post facto study focuses on establishing possible nexus through the observation of prior conditions or status and tracing back in time for plausible influential attribute (Okerekeoti, 2022). The time series observation was sourced from Central Bank of Nigeria 2022 for a period of 33 years spanning 1990 to 2022. The core independent variables extracted were Net taxes on products and government capital expenditure and real economic growth as the dependent variable.

3.1. Model Specification

To establish the rationale for this study, we adapted and modified the model from Adefolake and Omodero (2022). The functional representation of the study model is:

$$RGDP = \alpha_0 + \alpha_1 TAXR + \alpha_2 GCEXP + \alpha_3 TGRE + \alpha_4 GFCF + \alpha_5 TERTRGE + \alpha_6 TDO + \mu_t$$

Where,

RGDP = Real Gross Domestic Product

TAXR = Tax Revenue

GCEXP = Government Capital Expenditure

TGRE = Total Government Recurrent Expenditure

GFCF = Gross Fixed Capital Expenditure

TERTRGE represents the interaction variable of tax revenue and government capital expenditure.

TDO = Total Government Debt Outstanding

α_0 is the intercept term for the model.

$\alpha_1 \dots \alpha_6$ are the slope coefficients to be estimated

μ_t is the error term.

3.2. Estimation Technique

The Autoregressive Distributed Lag (ARDL) model is a statistical technique used to analyze the relationship between a dependent variable and one or more independent variables over time. The model can capture both short-run and long-run dynamics and is particularly useful when the series are integrated of different orders (I(0) or I(1)), making it versatile for co-integrated systems. Standard Error was used to measure the variability in the estimated coefficient. Smaller standard errors indicate more precise estimates. T-Statistics measures the ratio of the estimated coefficient to its standard error. It was employed in determining the significance of the coefficient. A higher absolute t-statistic indicates that the variable is more significant. P-values indicate the probability of observing the data given that the null hypothesis is true (typically that the coefficient is equal to zero). A smaller p-value (commonly below 0.05 or 0.01) suggests that the variable is significant in explaining the dependent variable.

4. Results and Discussion

This section is concerned with the presentation, analysis and discussion of the real economic growth model specified in the previous section. It comprises the unit root testing with Augmented dickey fuller test, estimation of the long run relationship of the variables in the model using autoregressive distributed lag technique and its error correction model, systemic adjustment to external shocks and the model's goodness of fit tests.

4.1. Test for Stationarity

Table 1a. ADF Unit Root Test

Variable	ADF @ Level	ADF @ First Difference	Mackinnon Critical Value			Order of Integration
			1%	5%	10%	
RGDP	14.106	0.084	-3.641	-2.955	--2.611	I(0)
TAXR	0.910	-7.227	-3.648	-2.958	-2.612	I(1)
GCEXP	3.598	-3.574	-3.641	-2.955	-2.611	I(0)
TGRE	9.424	-1.203	-3.641	-2.955	-2.611	I(0)
GFCF	-4.211	-5.809	-3.641	-2.955	-2.611	I(0)
TDO	11.897	0.819	-3.641	-2.955	-2.611	I(0)

Source: Computed by the Researchers, using STATA

4.1. Test for Stationarity

Table 1b. ADF Unit Root Test

Variable	ADF @ Level	ADF @ First Difference	Mackinnon Critical Value			Order of Integration
			1%	5%	10%	
LRGDP	-1.463	-3.488	-3.648	-2.958	-2.612	I(1)
LTAXR	0.656	-7.330	-3.648	-2.958	-2.612	I(1)
LGCEXP	-0.423	-6.176	-3.648	-2.958	-2.612	I(1)
TGRE	-1.237	-8.602	-3.648	-2.958	-2.612	I(1)
LGFCF	-3.282	-5.930	-3.641	-2.955	-2.611	I(0)
LTDO	-2.454	-4.631	-3.648	-2.958	-2.612	I(1)

Source: Computed by the Researchers, using STATA

Tables 1a & b summarize the results of the Augmented Dickey-Fuller (ADF) test, which are used to assess the stationarity of time series variables at their normal and log-transformed levels. The first column lists each variable being tested for stationarity, which in this case includes RGDP (Real GDP), TAXR (Tax Revenue), GCEXP (Government Capital Expenditure), TGRE (Total Government Recurrent Expenditure), GFCF (Gross Fixed Capital Formation), and TDO (Total Debt Outstanding). ADF at levels column presents the ADF test statistic values obtained when testing the series at levels (i.e., without first differencing).

A higher absolute value indicates stronger evidence against the null hypothesis of a unit root (inertia or non-stationarity). ADF at first difference column shows the ADF test statistic values calculated after taking the first difference of the series. The result of the variables in their normal (untransformed) nature (Table1a) shows all the variables except TAXR were stationary at levels while their log transformed form (Table1b) indicate variables integrated of order 1 with LGFCF integrated of order zero, given the mixed level of stationarity for the two forms of the data series. This stage applied the autoregressive distributed lag (ARDL) to investigate the long run effect of tax revenue and government capital expenditure on economic growth in Nigeria. It further investigates the moderation effect of capital spending on tax revenue and economic growth nexus.

Table 2. Lag Selection Criteria

Model	Observation	ll(null)	ll(model)	df	AIC	BIC
	40	-405	-359	14	746	769

Source: Computed by the Researchers, using STATA

It is always advisable to determine the optimal length of ARDL model using criteria involving Akaike's (AIC) or Bayesian information criteria (BIC) before proceeding to the stage of bounds testing. In line with Table 2 result, it could be observed that BIC (769) with degree of freedom 14 exhibits the minimum information criteria. Table 2 presents the results of some lag selection criteria for a model with a specified number of observations, likelihood values, degrees of freedom, and information criteria. The model with six estimated independent parameters fits the data significantly better than a null model (as suggested by the log-likelihood). Both AIC and BIC values provide insights into selecting appropriate lag length, with considerations that AIC might suggest more complexity and BIC leaning towards parsimonious models.

4.2. Co-integration Analysis

Table 3. Bounds Testing for Co-integration

F-test (Pesaran, Shin AND Smith Co-integration Test)		
	<----- I(0) ----- I(1) ----->	
10% critical value	2.33	3.54
5% critical value	2.76	4.12
1% critical value	3.79	5.41
F-stat. =	42.700	

Source: Computed by the Researchers, using STATA

Based on the results from Table 3, there is strong evidence of co-integration among the variables based on the higher F-statistic. The F-statistic (42.7) value is significantly higher than both the I(0) and I(1) critical values at all levels of significance (1%, 5%, and 10%). Specifically, at 10% significance, the critical value is 2.33; at 5% it's 2.76; and at 1% it's 3.79 at the lower bound and 3.54, 4.12 and 5.41 at 10%, 5% & and 1% respectively at upper bound level. Therefore, we reject the null hypothesis of no co-integration at any of the significant levels. This suggests that there is a long-run relationship among the variables tested, indicating that the variables are co-integrated. In practical terms, this indicates that despite some challenges in determining the exact nature of non-stationarity, the variables are likely related over the long term, making it appropriate to model them through methods that account for this relationship, such as an Error Correction Model (ECM) or ARDL framework. Given the evidence of co-integration, this study estimated an ARDL model and ECM to explore the dynamics of the relationships over time.

4.3. Long Run Coefficient Estimates

The independent variables included in the regression model are TAXR1 (Tax Revenue), GCEXP1 (Government Capital Expenditure), TGRE1 (Total Government Recurrent expenditure), GFCF1 Gross Fixed Capital Formation, TERTRGE (interaction of Tax Revenue and government capital expenditure measure), TDO1 (Total Debt Obligations) and CONS (the constant term of the regression).

Table 4. ARDL Regression

LRGDP	Coefficients	Standard Error	T-Statistics	P-values
TAXR1	-0.01075	0.07922	-2.53	0.018
GCEXP1	-0.06742	0.00426	-3.16	0.004
TGRE1	-0.00070	0.02133	-0.07	0.946
GFCF1	0.00002	0.01032	0.21	0.834
TERTRGE	0.02944	0.00008	3.30	0.003
TDO1	-0.00028	0.00892	-0.13	0.899
CONS	1.76999	0.00215	3.02	0.005

Source: Computed by the Researchers, using STATA

The specific analysis of the model estimates is presented and interpreted in the following order:

For TAXR1 the Coefficient, (-0.011) shows that a percentage increase in TAXR1 is associated with a decrease in the dependent variable economic growth by 0.011, suggesting a negative relationship. The p-value (0.018) indicates this relationship is statistically significant at the 5% level. GCEXP1 coefficient -0.067 shows a percentage increase in government capital expenditure results in a decrease in the dependent (real economic growth) variable by 0.067, also indicating a negative relationship. The p-value (0.004) shows strong significance, allowing rejection of the null hypothesis. TGRE1 Coefficient (-0.001) shows the effect of TGRE1 is minimal, suggesting almost no impact on the dependent variable of RGDP with a p-value of 0.946, this variable is not statistically significant, indicating we cannot reject the null hypothesis. For GFCF1 coefficient estimate of 0.00002, a percentage increase in gross fixed capital formation has a negligible positive effect on the dependent variable. The p-value (0.834) indicates it is not statistically significant.

The interaction effect of tax revenue and government expenditure (TERTRGE) with an estimated coefficient of 0.029 suggests that increases in tax revenue invested in capital projects are positively related to the dependent variable. The p-value of 0.003 indicates strong evidence to suggest this effect is statistically significant. TDO1 estimated coefficient (-0.0003) suggests a minimal and negative effect on real

economic growth. The p-value (0.899) shows a lack of statistical significance. The constant (_CONS) has a coefficient of 1.77. This represents the value of the dependent variable when all other independent variables are zero. It's the intercept of the regression line. The p-value (0.005) shows that this constant is statistically significant.

4.4. Error Correction Model

The error correction model is a further confirmation to the existence of a long run relationship among the variables in the growth model and furnishes us with the information about the rate of convergence of the model from the short run dynamics to the long run contemporaneous state.

Table 5. Estimation of Error Correction Model (ECM)

DRGDP	Coefficients	Standard Error	T-Statistics	P-values
DTAXR	9.03	3.481	2.59	0.014
DLGCEXP	2783	1232	2.26	0.031
DLTGRE	-958	1959	-0.49	0.628
DLGFCF	3719	3219	1.16	0.257
TERTRGE	41.4	28.47	1.45	0.156
DTDO1	1426	1862	0.77	0.449
_ECM	-0.980	0.222	-4.41	0.000
Constant	-1437	1195	-1.20	0.238

Source: Computed by the Researchers, using STATA

The output of the short-run regression model (Table 5), detailing each of the variables, their coefficients, standard errors, t-statistics, p-values, are presented in the error correction model and interpreted as follows:

Change in Tax Revenue (DTAXR) has an estimated coefficient of 9.03: that means for each unit increase in DTAXR (change in tax revenue), the real economic growth (Real GDP) is expected to increase by approximately 9.03 units holding all other variables constant. Standard Error (3.48) indicates the estimated variability of the coefficient. A smaller standard error relative to the coefficient indicates a more precise estimate. T-Statistic (2.59) shows the value indicates how many standard deviations the coefficient is away from zero. A T-statistic greater than 2 suggests that the coefficient is statistically significant. The p-value (0.014) is below 0.05, indicating the coefficient is statistically significant at the 5% level. This suggests a significant positive relationship between change in tax revenue and the dependent variable.

A percentage increase in Government Capital Expenditure (DLGCEXP) results in a more than proportionate increase (2783%) in the RGDP, controlling for other variables. Standard Error (1232) represents the variability in the estimate while T-Statistic (2.26) indicates that the observed effect is also statistically significant. The p-value (0.031) is below 0.05, thus there is sufficient evidence to regard the effect of changes in government expenditure on the dependent variable as statistically significant. The absolute value of the t-statistic (-0.49) for Total Government Recurrent Expenditure (DLTGRE) is less than 2, indicating that this coefficient is not statistically significant. A p-value (0.628) is above 0.05 indicates that we fail to reject the null hypothesis that this coefficient is zero, suggesting that changes in total government recurrent revenue do not significantly affect the dependent variable. The large standard error (3219) suggests high variability and potential instability in the Gross Fixed Capital Formation coefficients. Considering the t-Statistic (1.16) the coefficient is not statistically significant, as the t-statistic is less than 2. The p-value (0.257) indicates a failure to reject the null hypothesis, meaning changes in gross fixed capital formation do not significantly affect the dependent variable.

The t-statistic (1.45) for the interaction of tax revenue and government capital expenditure (TERTRGE) shows that the coefficient is not statistically significant at conventional levels. A p-value (0.156) above 0.05 indicates that we do not have enough evidence to assert that interacting revenue and capital expenditure significantly affects the economic growth variable in the short-run. From the standard error (28.5) it is seen that the variability of this estimate is relatively low compared to its coefficient. For change in Total Debt Obligations (DTDO1Coefficient=1426). A unit increase in total debt obligations may lead to an increase of 1426 units in real economic growth. The Standard Error of 1862 indicates high uncertainty in this estimate. T-Statistic (0.77) indicates a lack of significance. P-Value of 0.449 which shows lack of statistical significance is confirmed here, indicating no strong relationship with economic growth.

The ECM (Error Correction Term), the coefficient is -0.980: This negative coefficient suggests that any deviation from the long run equilibrium (represented by the error correction model) will result in a significant correction towards that equilibrium. The Standard Error (0.222) is a relatively small standard error, indicating a precise estimate. The strong T-statistic (T-Statistic= -4.41) implies significant correction speed toward equilibrium. With a p-value well below 0.01, we can strongly conclude that this term is statistically significant. It indicates a strong tendency for the dependent variable to return to its long run value after a shock. The

only statistically significant variables at the 5% level are DTAXR (change in tax revenue), DLGCEXP (change in government capital expenditure), and the ECM (error correction term). They are influential in explaining changes in the dependent variable. Notably, DLTGRE, DLGFCF, TERTRGE, and DTDO1 are not statistically significant, suggesting that they do not have a meaningful impact on the dependent variable in the short run model.

Table 6. Diagnostic Test Results

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity			
Ho: Constant variance			
Variables: fitted values of D.drgdp			
chi2(1)	= 0.15	0.698	P-value
			0.698
Breusch-Godfrey Serial Correlation LM Test:			
lags(p)	chi ²	df	Prob > chi ²
1	0.246	1	0.868
H0: no serial correlation			
Shapiro-Wilk W test for normal data			
Residuals	0.919	Probability	0.008

Source: Computed by the Researchers, using STATA

These diagnostic tests (Table 6) help to validate the assumptions of the regression model, providing insights into its reliability and the potential need for further adjustments or considerations in model specifications. The absence of heteroskedasticity and serial correlation lends support to the robustness of the regression model's estimates and predictions. Lags (p): The test is conducted with 1 lag (p=1).

chi² = 0.246: This is the chi-squared statistic for the test. There is 1 degree of freedom (df=1) due to testing serial correlation with 1 lag. Prob > chi² = 0.868. A very high p-value indicates that we do not reject the null hypothesis. Therefore, there is no evidence of serial correlation in the residuals. This indicates that the residuals are likely independent, satisfying one of the key assumptions of regression analysis. The Breusch-Pagan test confirms that there is no evidence of heteroskedasticity as the p-value is high (0.698). This suggests that the residuals have a constant variance. The Breusch-Godfrey test indicates no serial correlation in the residuals with a p-value of 0.868, suggesting that the independence assumption holds in this regression model. This is the Shapiro-Wilk W statistic (W = 0.919) for normality of residuals. The closer this statistic is to 1, the more likely the data is normally distributed.

5. Policy Implications, Recommendations and Conclusion

The significant positive coefficients on DTAXR and DLGCEXP suggest that these are important factors for policymakers to consider, as increases in tax revenue and government investment may significantly drive changes in the dependent variable. The significant error correction term indicates that any divergence from a long-term equilibrium is corrected over time, highlighting the presence of a long-run relationship among the variables.

A significant error correction term indicates a tendency for the dependent variable to return to its long-term equilibrium following a shock. This implies that any deviation from this equilibrium will eventually correct itself. The highly transitory adjustments from the short-run results convey how quickly the economy responds to changes in policy or external shocks.

The real economic model output illustrates the dynamics at play in the relationship between the core independent variables (tax revenue and capital expenditure) and the dependent variable. - Real economic growth. Tax and capital expenditure significant lagged effect indicates that previous periods' changes can have immediate effects on the real economic growth, suggesting the importance of timely interventions.

The long run individual estimates of tax revenue and expenditure shows a significant retarded effect on real economic growth; however, the interaction of revenue and expenditure significantly increases growth by 2.9 percent in the long run.

This implies that government efficient utilization of its internally generated revenue particularly in capital investment projects has the capacity of significantly increasing real economic growth in Nigeria. Hence, the government should explore more economically efficient ways of harnessing revenue and appropriately deploy such into capital intensive expenditure that will create more opportunities to advance economic growth.

Given that tax revenue interaction with capital expenditure is positively associated with real growth, policies aimed at broadening the tax base or increasing tax compliance should be pursued. This could involve digital transformations in tax collection and administration to enhance efficiency.

Increase in government capital investment spending is essential since the study interaction effect support significant positive impacts from government capital

expenditure. Policymakers should prioritize investments in infrastructure, education, and technology. Effective allocation of capital could yield significant long-term benefits for economic growth.

Given that rising total debt obligations might not have a negative impact in the short run but could place long-term strain on the economy, a balanced debt policy must be stressed. Measures for sustainable debt management and borrowing parameters may be essential to ensure long-term fiscal health.

Recognizing the error correction mechanism's significance, policymakers could benefit from consistent communication strategies to manage public and market expectations. This helps to mitigate the impacts of shocks and ensures smoother adjustments towards long-run targets.

Regular monitoring of key economic indicators and the structure of public finances. Establishing a robust monitoring framework will allow for adjustments in policy, when necessary, especially in response to external shocks or changes in economic conditions.

In conclusion, the insights drawn from the long-run and short-run results of the regression analysis provide a nuanced understanding of the economic dynamics at play. Policymakers are urged to build on these significant findings while addressing identified issues such as the insignificant capital formation, recurrent expenditure proactively. This multi-faceted approach allows for a balanced strategy that not only promotes sustainable economic growth but is also resilient in the face of potential challenges. The focus should remain on developing adaptive policies that respond to both immediate needs and long-term goals, ensuring a stable economic environment conducive to growth and development for the future.

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