

PUBLIC EXPENDITURE AND INFLATION RATE IN NIGERIA

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ABSTRACT

This paper examined the relationship between inflation and government spending in Nigeria for the period 1990 to 2022. The study utilized Augmented Dickey-Fuller unit root test, Johansen co-integration; Granger causality Test and Vector Error Correction Model (VECM) approaches. The secondary data variables in consideration are government spending (GEXP), inflation rate (INF), exchange rate (EXR) and broad money supply (MS2) and they were sourced from CBN Statistical Bulletins. Although the unit root tests showed that the variables possessed a unit root problem at their level but freed from this at their first order of integration, the Johansen co-integration result showed that the variables were co-integrated. The result indicated that there is a long-run and short-run bilateral causal relationship between inflation and government spending. The regression estimate based on the short run and long run VECM showed that inflation rate has a positive significant influence on government spending in Nigeria over the study period. Money supply is positively related with government spending in the recent years. Meanwhile exchange rate over the study periods showed a significant reduction in government spending in Nigeria in the recent years because a rise in exchanger rate reduced the value of naira and hence affect the government expenditure negatively.

Keywords: Government Expenditure, Inflation, Exchange rate, Money Supply.

1. INTRODUCTION

Over the years in Nigeria inflation has been rising and falling to keep up with the level of economic activity. Normally increase in public expenditure which normally leads to a rise in inflation and aggravates inflation changes is expected to boost economic activities and lead to a rise and sustainable Government expenditure (Anyawu. 2020). But on the contrary, inflation has been changing upwardly and yet the growth in government expenditure in Nigeria has not been consistently rising as expected.

The debate on inflation dynamics and Government expenditure nexus is still ongoing. The argument centered on whether or not increasing public spending has the potential to induce inflation. While some scholars are of the belief that increasing public expenditure enhances inflation, others are of the view that, it is inflationary pressure that causes the growth of Government expenditure in both developing and developed countries, (Ezirim et al, 2008). There is still an unresolved issue theoretically as well as empirically as to the effect of Government expenditure on inflation.

The issue of lack of consensus on the direction of causality between the two has been on-going for ages among researchers. This actually made it interesting to contribute to the existing literature on the issue with this study. In addition, the super-neutrality of money has also been brought into question here as to whether the impact of inflation is more significant in the long run or in the short

run (Pamperdemous, 2013). Consequently, the major objective of this study is to investigate the impact of inflation on Government expenditure. Apart from investigating the impacts in both long and short run periods, the study will also assess the direction of causality between the two. The rest of the paper is divided into a literature review, methodology, results, and discussion, conclusions and recommendations.

2. LITERATURE REVIEW

There are various empirical studies on issue relating to government expenditure. However, most common feature of many of them is that they centered on its impact on growth only few investigated its relationship with inflation. Some of the related literatures are discussed as follows;

Castro and Hubic (2010) studied the effects of fiscal shock on economic variables by employing OLS as estimation technique. They analysed quantitatively the effects of inflation on general government accounts for some euro area countries and find out that inflation is not always positive for public finances. Rather, inflation weights on economic growth, which may leads to deteriorating government balance and increase public debt. Since inflation will reduce the value of money, thereby limiting the extent to which government can spend on providing basic infrastructures. Castro and Hubic failed to recognize the impact of inflation incidence in the developing countries.

Tayeh and Mairna (2011) examined the factors that affect the Jordanian total government expenditures by using correlation and cointegration analysis. The study showed that government expenditure is significantly related to the variables of inflation rate, unemployment rate and population with a typical relationship between government expenditure and inflation. They however recommended that there is a need to develop more different economic sectors and make them capable of utilizing their competitive aspects by improving both infrastructure facilities and superstructure services. this should be enforced by expanding the role of the Private Sector investment and capital attraction, this process must be within a framework of mutual cooperation between different stakeholders (mainly public and private sectors).

Olaiya e tal (2012) investigated the causality relationship among economic growth, public expenditure and inflation rate in Nigeria for the period spanning 1970 to 2010, using co-integration analysis and trivariate causality test. They reported the existence of long run relation among the variables. Their findings revealed the existence of a bi-directional causality between government expenditures and economic growth both in the short run and in the long run while a unidirectional causality was observed in the short run from economic growth and government expenditure to inflation rate. The implication of this result is that both government spending and economic growth also influence inflation rate in Nigeria. Based on these findings, they recommend that government should implement policies that would moderate government spending in order to reduce inflation rate. To compliment for the loss in economic growth through the reduction in government spending, lending rate should be moderated in order to encourage private investors in investing in the Nigerian economy. The reduction in inflation rate is essential because price stability is an incentive for investment and motivation for inflow of foreign capital, which can promote economic growth.

Olawumi and Tajudeen (2009) examined empirically the contribution of fiscal policy in the achievement of sustainable economic growth in Nigeria between 1970 and 2006. Ordinary Least Square (OLS) technique was used in this study and the result showed that fiscal policy does not have significant impact on economic growth in Nigeria. The finding seems invalidating the Keynesian postulation of the need for an active policy to stimulate economic activities. However, factors such as policy inconsistencies, high level of corruption, wasteful spending, poor policy implementation and lack of feedback mechanism for implemented policies evident in Nigeria which are indeed capable of hampering the effectiveness of fiscal policy have made it impossible to come up with such a conclusion. To put economy, therefore, along the path of sustainable growth and development, they stated that the government must put a stop to the incessant unproductive foreign borrowing, wasteful spending and uncontrolled money supply and embark upon specific policies aimed at achieving increased and sustainable productivity in all sectors of economy.

Olukayode (2009) examined the link between government spending and economic growth in Nigeria over the last four decades (1977 – 2006) using time series data. OLS approach was employed to analyse the Ram (1986), model was developed to regress Real GDP on private investment. Human capital investment, government investment and consumption spending at absolute levels regressing it as a share of real output and regressing the growth rate real output to the explanatory variable as share at real GDP. The result showed that private and public investments have significant effects on economic growth during the review period. There was an attempt to test for presence of stationary using Augmented Dickey Fuller (ADF) unit root test, and it revealed that all variable incorporated in the model were non – stationary at their levels. In a bid to establish long run relationship between public expenditure and economic growth, the result revealed that the valuable were co integrated at 5 percent and 10 percent critical level. Were paper also used error correction model to detect short run behaviour of the variables. The result showed that for any distortion in the short run, the error restore the relationship back to its original equilibrium by a unit. A number of suggestions were however made on how government spending should be channel in order to influence economic growth significant and positively in Nigeria. This empirical literature shows that there is a limited empirical study in Nigeria to properly address the link between growth inflation and government expenditure. Indeed, most of the works have focused on the causal relationship between fiscal deficit or government expenditure and economic growth. It is evident from the review of literature that there is dearth of studies on the link between growth inflation and government expenditure. The interest of this study is, therefore, to address the neglect issue on the nexus between inflation and government expenditure. Therefore, this study intends to fill the gap.

3. METHODOLOGY

This section deals with the methodology used to source data and the methods adopted in analyzing these data so as to arrive at the main objective of the study. It involves theoretical framework of the model, model specification; estimation techniques, sources of data and measurement

Theoretical Framework

The model for this study is pinned down to the Neo-Keynesian theory of government spending

which deduced that increase in government spending causes inflation in such a way that increase in inflation rate may result in decrease in government expenditures. This theory focuses on productivity, because, declining productivity signals diminishing returns to scale and consequently, induces inflationary pressures, resulting mainly from over-heating of the economy and widening output gap. One of the recent studies adopting this approach is Loizides and Vamvoukas (2005), they utilize a trivariate error correction model to study the relationship between government size measured as the ratio of total government expenditure percentage over GDP and the rate of output growth in India, Indonesia and Vietnam. The three variables include GDP growth rate, growth rate of the share of government expenditure in GDP, and either unemployment rates or inflation rates. Method of co-integration and Granger causality were employed in this study using time series data. The model can either be bivariate or trivariate, that is two or three endogenous variables in the system, respectively. Morealso, Tayeh S. N. and Mairna H. M. (2011) examined the factors that affect the Jordanian total government expenditures by using correlation and cointegration analysis. They include total expenditures (GEXP) as function of inflation (INF), unemployment (EMP), imports (IMP), exports (EX) and other endogenous variables in their model. The model showed that government expenditure is significantly related to the variables of inflation rate, unemployment rate and population with a typical relationship between government expenditure and inflation.

Model Specification

In the current paper, both bivariate and trivariate VECM are adopted to evaluate the causal link between inflation and government spending. The bivariate VECM include the two endogenous variables, which are growth rate of annual consumer price index (CPI) and growth rate of government spending as percentage of GDP. In the trivariate system, apart from the two above variables, either nominal exchange rate or GDP per capita is added as another endogenous variable in the system. The inclusion of another endogenous variable may help in controlling for possible omitted variable bias and also in testing for the robustness of the estimated results in the bivariate system.

Model specification in the study consists of a system of one equation in 3 explanatory variables. They are then specified that government spending (GEXP) is a function of changes inflation rate (INF), exchange rate (EXR) and broad money supply (MS₂). Hence the model equation is specified as follows:

$$GEXP = \beta_0 + \beta_1\Delta INF + \beta_2EXR + \beta_3MS + \mu_t \dots\dots\dots(1)$$

Where; GEXP = Government spending (Proxies as total expenditure as a percentage of GDP) Δ INF = Changes in the Inflation rate (Standard deviation of inflation rate), EXR = Exchange rate (Proxies as real exchange rate), MS = Broad money supply (Proxies as broad money supply as a percentage of GDP), Ut = Stochastic Variable (Error term), B₀ = Constant term, β₁, β₂ and β₃ = Parameters to be estimated

Estimation Techniques

The conventional approach to time-series econometrics is based on the implicit assumption of

stationarity of time-series data. A recent development in time-series econometrics has cast serious doubt on the conventional time-series assumptions. There is substantial evidence in the recent literature to suggest that many macroeconomic time series may possess white noise. That is, they are non-stationary processes. A time-series integrated of order zero $I(0)$, is level stationary, while a time-series integrated of order one, $I(1)$, is stationary in first difference. Most commonly, series are found to be integrated of order one, or $I(1)$. The implication of some systematic movements of integrated variables in the estimation process may yield spurious results. In the case of a small sample study, the risk of spurious regression is extremely high. In the presence of $I(1)$ or higher order integrated variables, the conventional t-test of the regression coefficients generated by conventional OLS procedure is highly misleading (Springer, 2011). Resolving these problems requires transforming an integrated series into a stationary series by successive differencing of the series depending on the order of integration. However, the differencing process loses valuable information in data, especially in the specification of dynamic models. If some, or all, of the variables of a model are of the same order of integration, following the Engle-Granger theorem, the series are cointegrated and the appropriate procedure to estimate the model will be an error correction specification. Hendry (1986) supported this view, arguing that error correction formulation minimizes the possibilities of spurious relationships being estimated as it retains level information in a nonintegrated form. Hendry (1986) proposed a general autoregressive distributed lag model with a lagged dependent variable, which is known as the 'error-correction' term. He also advocated the process of adding lagged dependent and independent variables up to the point where residual whiteness is ensured in a dynamic specification. Therefore, error correction models avoid the spurious regression relationships. To guard against the possibility of estimating spurious relationships in the presence of some non-stationary variables, estimation is performed using a general-to-specific Hendry-type error correction modeling (ECM) procedure. This procedure begins with an over parameterized autoregressive distributed lag (ADL) specification of an appropriate lag. The consideration of the available degrees of freedom and type of data determine the decision on lag length. With annual data, one or two lags would be long enough, while with quarterly data a maximum lag of four can be taken. Under this ECM procedure, the long run relationship is embedded within the dynamic specification, (Wooldridge, 2013).

Unit Root Test

Macroeconomic time series data are generally characterized by stochastic trend which can be removed by differencing. Thus, this paper used or adopt Augmented Dickey-Fuller (ADF) Techniques to test and verify the unit root property of the series and stationarity of the model, (Dickey and Fuller, 1997).

Co-integration test

Two variables are said to be co-integrated if they have a long-term, or long run equilibrium, relationship between them. If two variables, dependent and an independent, are individually non-stationary but their residual (combination) is stationary, those variables are co-integrated on the long run (Gujarati, 2004; Yang, 2000). In this case the researchers used the Johansen co-integration test to test co-integration since it is the only test which can estimate more than one co-integration relationship if the data set contains two or more time series as well as gives the maximum rank of

co-integration, (Dickey and Fuller, 1981).

Causality Test

In order to determine which variable in the model causes the other, the Granger causality test is to be used. The F-statistics is used to reject or accept the null hypothesis of no causation between the variables when F-statistics is greater than 2 and less than 2 respectively. Engle and Granger (1987) causality test regresses a variable, H, on lagged values of itself and another variable P. If P is significant, it means that it explains some of the variance in H that is not explained by lagged values of H itself. This indicates that P is causally prior to H and is said to dynamically cause or Granger cause P. This means that P does not granger cause H if $\beta_2=0$. The Granger equation is shown below:

$$H_t = \sum_{j=1}^m \beta_{1j}H_{t-j} + \sum_{j=1}^m \beta_{2j}P_{t-j} + \mu_t \dots\dots\dots(2)$$

For the purpose of this study, the granger causal equation is represented thus:

$$GEXP_t = \sum_{j=1}^m \beta_{1j}GEXP_{t-j} + \sum_{j=1}^m \beta_{2j}INF_{t-j} + \mu_t \dots\dots\dots(3)$$

Where, GEXP is government expenditure, INF is inflation rate, m’s are lag periods, β_{1j} and β_{2j} are parameters to be estimated and U_t denotes stochastic error term.

Error Correction Mechanism (ECM)

The Engle – Granger representation theorem proves that, if a co-integrating relationship exists among a set of I(1) series, then a dynamic error-correction (EC) representation of the data also exists. The methodology used to find this representation follows the "general-to-specific" paradigm (Hendry, 1987). Initially, first difference of each variable in the model for this study, a constant term, and one-lagged EC term (EC_{t-1}) generated from the static regression procedure were used. Then the dimensions of the parameter space were reduced to a final parsimonious specification by sequentially imposing statistically insignificant restrictions or eliminating insignificant coefficients, (William and Judith, 1978). In case of this study, equation for Vector Error Correction Model is represented as shown below:

$$\Delta GEXP_t = \beta_0 + \beta_1 ECM_{t-1} + \sum_{j=1}^{P_1} \beta_2 li \Delta GEXP_{t-j} + \sum_{j=1}^{P_2} \beta_3 li \Delta INF_{t-j} + \sum_{j=1}^{P_3} \beta_4 li \Delta EXR_{t-j} + \sum_{j=1}^{P_4} \beta_5 li \Delta MS_{t-j} + \mu_t \dots\dots\dots(4)$$

Where, ECM is error correction term (i.e measure of the speed of adjustment), Δ is the first-difference operator, p’s are lag periods, β_0 is constant, $\beta_1 - \beta_5$ are parameters to be estimated and U_t denotes stochastic error term.

Sources of Data and Measurement

The data used for this study are basically time series data covering 1990 – 2022, that is thirty-three (33) years. The data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin. In

terms of measurement, total expenditure as percentage of GDP will be used to proxy government spending, inflation rate is used; real exchange rate will be used for exchange rate while broad money supply (MS_2) as percentage of gross domestic product (GDP) will be used as proxy for money supply.

4. RESULTS AND DISCUSSION

The discussion of the relationship between various forms of taxation and government revenue in Nigeria begins with the assessment the time series properties of the variables included in the regression model. The Augmented Dickey Fuller test is adopted for this purpose and the result is presented in table 1

Table 1: 4.1 Unit root test

Variables	ADF Statistics	Order of integration
GR	-4.773774***	I(1)
VAT	-3.796821**	I(0)
CIT	-6.433655***	I(1)
PPT	-4.190542***	I(1)
CED	-11.66749***	I(1)
EXR	-4.329326***	I(1)
INF	-4.415198**	I(1)
OILP	-3.435872	I(1)

(*) Statistical significance at 10%, (**) Statistical significance at 5%, (***) Statistical significance at 1%

Source: Authors computation, 2023

The results of the unit root test show that all the variables are integration of order one that is I(1) except government expenditure which is stationary at levels that is I(0). The implication is that five out of the six variables in the model are non-stationary and thus a linear combination of them can be stationary. This is the essence of cointegration. However, the choice of the cointegration techniques depends on the order of integration of the variables. Since not all the variables are I(1) then, Johansen cointegration technique cannot be applied hence Autoregressive distributed lags ARDL bound test is used.

Cointegration test

The next stage of the analysis is the cointegration test. As earlier discussed, the result of the unit root test shows the bound test approach of the ARDL is suitable for conduction the test for cointegration. The results is presented in Table 2.

Table 2 : ARDL bound test for cointegration

Test Statistic	Value	k
F-statistic	1.887811	7
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

Source: Authors computation, 2023

The idea behind cointegration is that is a variable is not stationary; a linear combination of the variable can be stationary. Table 2 shows that results of the cointegration test to ascertain if there exists long or short run relationship between government revenue and other forms of taxation in Nigeria. The null hypothesis is there is no long run relationship among the variables. However, considering the results as presented in table 2, the F statistics value is 1.887811, which is less than the critical values at 5% for both lower and upper bound tests. The implication of the result is that the null hypothesis is accepted and hence we conclude that there is no long run relationship between the different forms of taxation and government revenue. However, the ARDL regression is presented next.

ARDL regression

Despite the confirmation of non-existence of cointegration between total government revenue and different forms of taxation, the ARDL regression is estimated in order to assess the level of relationship especially in the short run period and the results are presented in table 3

The results in table 3 shows that the cointegration test presented in table 2 is in order. The ARDL regression shows that none of the explanatory variables has significant impact on government revenue unlike the short run relationship where some of the variables exert significant impact on government revenue. For instance, Company Income Tax (CIT) shows a significant impact on government revenue as well as revenue realized in the previous period. It should be noted that out of the four forms of tax used in the study only CIT showed individual statistical significant impact on government revenue. This further underscores the importance of revenue collected from various companies but private and public in Nigeria. However, oil price has been shown to be an important factor driving government revenue in Nigeria. The coefficient of oil price in the short run is significant thus, indicating that oil price is an important variable that affects Nigerian government revenue. Also among the macroeconomic variables.

Table 3 ARDL estimated regression

Short Run Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LTGR(-1))	0.421362	0.102164	4.124377	0.0001
D(LVAT)	0.174327	0.413189	0.421906	0.6744
D(LPPT)	0.221362	0.202937	1.090788	0.2791
D(LCED)	0.048057	0.072928	0.658971	0.5120
D(LCIT)	2.841776	1.330933	2.135177	0.0362
D(LEXR)	0.069474	0.159237	0.436294	0.6639
D(LINF)	-1.216407	0.326181	-3.729235	0.0004
D(LINF(-1))	0.629096	0.349791	1.798490	0.0763
D(LOILP)	1.902121	0.685974	-2.772875	0.0071
D(LOILP(-1))	1.097599	0.738133	1.486994	0.1414
CointEq(-1)	-0.076496	0.026972	-2.836076	0.0059
Cointeq = LTGR - (2.2789*LVAT + 2.8938*LPPT + 0.6282*LCED -6.0635				
*LCIT + 0.9082*LEXR -1.8597*LINF -0.8388*LOILP + 9.6987)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LVAT	2.278911	5.261396	0.433138	0.6662
LPPT	2.893782	2.957349	0.978506	0.3311
LCED	0.628235	1.035550	0.606668	0.5460
LCIT	-6.063513	3.929294	-1.543156	0.1272
LEXR	0.908214	1.982008	0.458229	0.6482
LINF	-1.859680	1.227638	-1.514844	0.1343
LOILP	-0.838845	3.400369	-0.246692	0.8059
C	9.698713	6.096819	1.590782	0.1161

Source: Authors computation, 2023

The effect of inflation rate on government revenue appears to be mostly pronounced. This might not be unconnected with its effect on the value of the revenue that is its real worth. It should also be noted that the coefficient of inflation rate is negative which is a pointer to the fact that it has significant negative or inverse relationship with government revenue. Finally, from the short run results it is obvious that all other forms of tax like value added tax VAT, petroleum profit tax PPT and custom and excise duty tax CED are not significantly driving the revenue of the government like company income tax. However, oil price as an external variable has been shown from the results as another major driver of the government revenue in Nigeria.

ARDL Diagnostic tests

As robustness tests to our estimations, some diagnostics tests are conducted. The tests are heteroscedasticity and serial correlation tests.

Table 4: ARDL Heteroscedasticity Test

heteroscedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.500027	Prob. F(24,6)	0.8946
Obs*R-squared	20.66703	Prob. Chi-Square(24)	0.6583
Scaled explained SS	2.134677	Prob. Chi-Square(24)	1.0000

Source: Authors computation, 2023

The results of the heteroscedasticity test is presented in table 4. The null hypothesis is that there is no heteroscedasticity. Using the F statistics, it is discovered that the probability of F shows that the null hypothesis is to be accepted. Therefore, we conclude that our model is not having the problem of heteroscedasticity, which may affect the validity of our results.

Table 5: ARDL Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.296767	Prob. F(2,4)	0.3680
Obs*R-squared	12.19369	Prob. Chi-Square(2)	0.0022

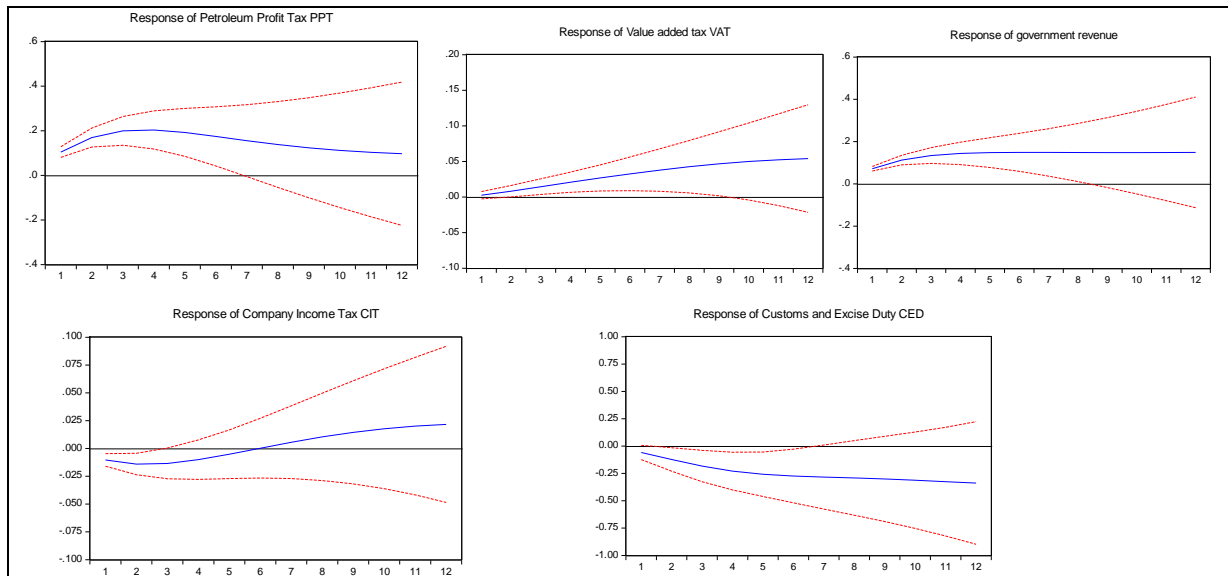
Source: Authors computation, 2023

The null hypothesis here is that there is no serial correlation. Considering the F statistics and the probability, it is obvious that the null hypothesis is to be accepted while we reject the alternative hypothesis that there is serial correlation. Consequently, the estimates from our model are valid and can be used for forecasting.

Impulse Response Analysis

Since the results of the analysis have shown that short run relationship among the variables are more significant than the long run relationships. The study further explored the behavior of the variables as they interact with one another in the short run using the Vector Auto-Regression VAR method. This allows the study to utilize both the IRFs that is impulse response function as well as the variance decomposition equations to further buttress the short run relationship between different forms of tax and government revenue in Nigeria.

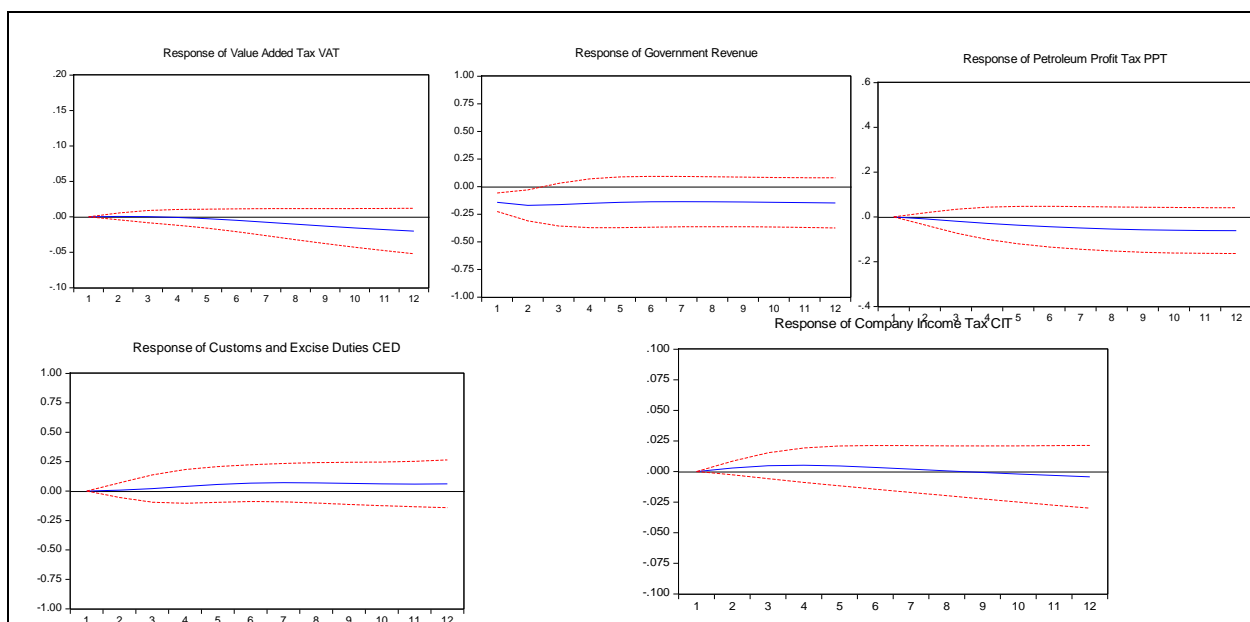
Figure 1: Response to oil price shocks



Source: Authors computation, 2023

The impulse response function in figure 1 explains the responses of the different forms of taxation and government revenue to 1% positive standard deviation in oil price. The reactions show that all the taxes and the government revenue all significantly respond to oil price shock. The implication the implication is that whenever there is oil price shock, government revenue rises significantly. However, the results of the IRF further indicates that VAT and PPT show the most significant response to oil price shocks.

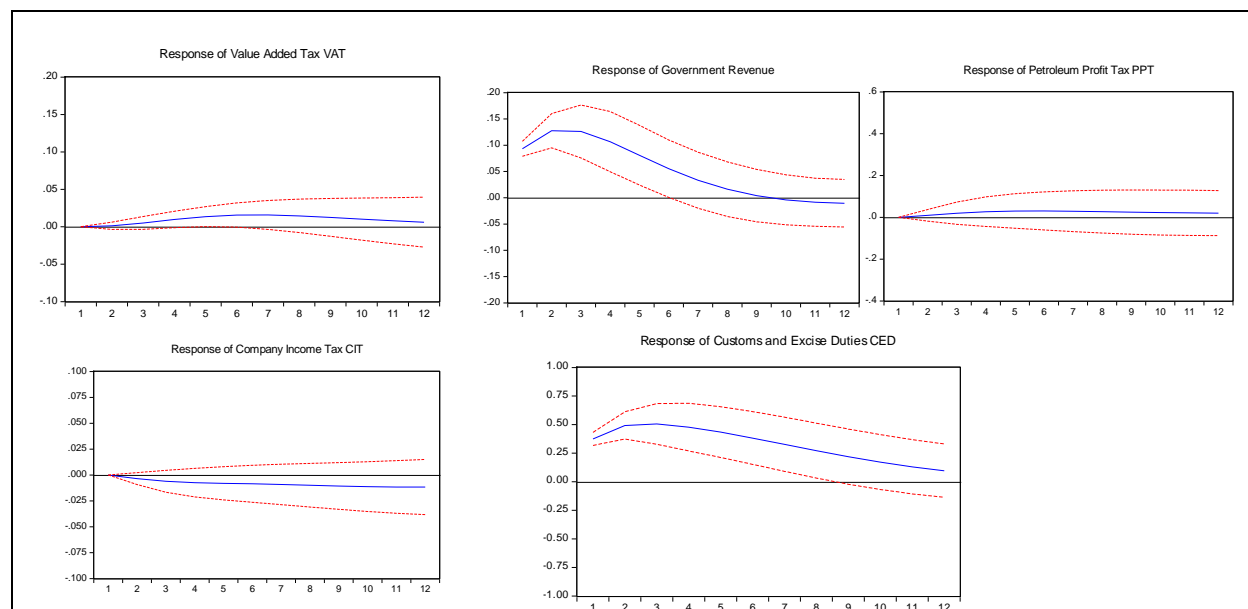
Figure 2: Response to inflation rate shocks



Source: Authors computation, 2023

Figure 2 describes the responses of the taxation and government revenue to inflation shock. The result of the IRF shows that the taxes failed to respond significantly to the shock from the inflation rate like we noticed under the oil price shocks. However, government revenue shows a significant downward movement at the earliest stage of the IRF. But for all the various taxes, there responses to inflation shocks appear to be passive.

Figure 3: Response to exchange rate shocks



Source: Authors computation, 2023

The responses of government revenue and various forms of taxation to exchange rate shocks is described in figure 3. The IRF indicates exchange rate shocks generates negative and significant response from government revenue. This is shows that when naira depreciate it has significant negative impact on the government revenue. Value added tax is another variable that reacts significantly to exchange rate shocks as well as customs and excise duties tax. In the case of excise duties, the exchange rate shock prompts the excise duties to fall significantly. This might not be unconnected with the fact that fall in the value of naira discourages importation and hence the revenue accruing from foreign exchange like the excise duties falls as well.

Variance decomposition

This aspect explains the contribution of each shocks to the behavior of each form of taxation captured in the VAR analysis.

Table 6: Variance decomposition of government revenue

Period	OILP	VAT	PPT	CED	CIT	EXR	INF	TGR
3	6.01940 1	0.22027 3	1.14178 2	1.49668 9	5.50387 9	1.47293 8	8.88004 2	75.2650 0
6	4.57862 2	0.54136 2	1.79644 2	4.30770 8	5.84802 7	1.63548 9	8.33021 4	72.9621 4
9	11.2201 7	0.54454 6	3.85764 6	4.24365 0	4.68188 8	1.28570 7	8.84179 9	65.3245 9
12	16.9442 5	1.67024 8	4.63767 3	3.79412 2	4.42798 4	1.54605 3	9.85197 7	57.1276 9

Source: Authors computation, 2023

Table 6 explains the contributions of each shock to the behavior of government revenue during the period under review. Apart from the own shock the analysis indicate that oil price contributes the largest shock to the behavior of government revenue. This is followed by company income tax CIT and inflation rate. The result supports the finding under the ARDL regression analysis. This speaks volume of the consistency in our result.

Table 7: Variance decomposition of value added tax VAT

Period	OILP	VAT	PPT	CED	CIT	EXR	INF	TGR
3	10.3822 0	84.9941 8	1.70445 1	1.60115 0	0.28944 8	1.00716 9	0.01716 3	0.00423 4
6	26.3255 9	48.4349 3	5.87890 9	11.8456 6	1.31672 3	5.81827 8	0.33433 0	0.04557 8
9	35.3826 8	35.9805 1	5.06010 7	13.8124 0	2.82740 6	5.23193 9	1.62540 3	0.07955 4
12	40.3165 2	32.1027 5	3.37300 0	12.0865 9	4.87013 3	3.45387 1	3.33876 8	0.45836 7

Source: Authors computation, 2023

The dominance of oil price in driving both government revenue and major forms of tax in Nigeria is shown in table 7. Apart from the own shock, oil price has been shown to be the most important factor controlling the behavior of value added tax VAT in Nigeria. However, customs and excise duties CED is also shown to have some influences on the behavior of value added tax also.

Table 8: Variance decomposition of customs and excise duties CED

Period	OILP	VAT	PPT	CED	CIT	EXR	INF	TGR
3	11.1533 3	0.09206 2	0.42421 4	86.2264 5	0.00578 1	1.74783 2	0.11178 8	0.23854 6
6	26.6851 5	0.13650 7	2.46573 9	56.5050 6	0.54529 1	12.4063 9	1.05806 4	0.19779 4
9	35.6976 4	0.20011 7	2.93109 7	37.8163 9	1.83860 1	19.2462 6	1.70829 5	0.56160 4
12	40.9381 4	0.22033 9	2.21939 6	29.3613 1	2.91365 6	21.7330 3	1.75713 3	0.85700 2

Source: Authors computation, 2023

Table 8 is an indication that the behavior of customs and excise duties as a form of taxation is also mostly controlled by oil price and exchange rate. As noticed in our earlier discussion, oil price remains dominant as a factor affecting all the various forms of tax covered in this study. In line with the IRF, exchange rate is also shown as an important factor that influences the behavior of the customs and excise duties.

Table 9: Variance decomposition of company income tax CIT

Period	OILP	VAT	PPT	CED	CIT	EXR	INF	TGR
3	11.4209 0	10.0488 1	11.2568 7	5.93394 0	59.2988 5	1.14603 5	0.72675 6	0.16782 4
6	5.61957 5	4.55331 2	8.50781 1	3.05331 5	75.1519 4	2.18686 5	0.82550 6	0.10167 4
9	5.10874 7	2.96729 1	5.48764 9	1.77142 3	81.2245 7	2.81360 1	0.50464 5	0.12207 9
12	7.59909 7	2.93766 8	3.67015 1	1.25443 7	80.6933 2	3.27162 7	0.45225 7	0.12144 6

Source: Authors computation, 2023

Table 9 describes the roles of each variable in influencing the behavior of CIT. it is obvious that oil price affect maintains its influence on the tax in Nigeria. Again, VAT, PPT and CED are other variables that can influence the behavior of CIT. The implication with the CIT as against all other forms of tax covered in the study is that CIT is largely influenced by other forms of taxation included in the VAR model, this shows that company income tax which has most influence on government revenue is highly susceptible to other forms of tax and oil price.

Table 10: Variance decomposition of petroleum profit tax PPT

Period	OILP	VAT	PPT	CED	CIT	EXR	INF	TGR
3	71.8894 8	8.59088 8	17.5343 2	0.82591 3	0.19629 9	0.43074 9	0.40351 0	0.12884 2
6	68.0794 9	15.1720 0	8.01052 8	5.73672 8	0.16591 1	1.10576 5	1.62813 3	0.10144 5
9	59.8878 6	20.1168 8	5.56501 1	9.67135 9	0.12146 0	1.27624 5	3.18452 8	0.17665 3
12	55.5351 7	22.4710 2	4.80150 6	10.7966 0	0.11936 1	1.32047 7	4.79229 6	0.16357 9

Source: Authors computation, 2023

Expectedly, oil price contributes the largest shock to the behavior of PPT. It is clear in the variance decomposition table that even more than the own shock. However, the dominance of oil price in Nigeria in contributing to government revenue and various forms of taxation is evident in table 10.

5. CONCLUSIONS

A strong link is also noticed between CED and exchange rate. The results from the study shows that CED reacts significantly and negatively to exchange rate shock. This describes a situation where currency depreciation reduces the revenue accruing to the government from Customs and excises duties CED. The implication is that as naira fall in value, it discourages importation and since Nigeria is more of importing country, revenue that are supposed to be realized on international transaction is reduced sine the volume of such transaction is hampered with currency depreciation. However, it can be concluded from the study that CIT which has been described as the most influential form of tax on the government revenue is also shown to be significantly affected by VAT, PPT and CED. The analysis indicate that increase in all these types of tax have significant negative impacts on the CIT.

6. RECOMMENDATION

Finally, it is recommended that tax policy in Nigeria should intermittently be subjected to short-term review and the framework updated before it can have significant impact on government revenue. Again, the revenue base of Nigeria needs to diversify because findings from the study has shown that oil it the major driver of government revenue as against these taxes. In addition, efforts should be made to improve the contributions of the CED, PPT and VAT to the revenue of the government.

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