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A Structural Vector Autoregressive Analysis of Fiscal Policy Rule and Real Economic Growth in Nigeria

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ABSTRACT

The operations of fiscal policy in Nigeria in the recent years have revolved around the adoption of an oil-priced based fiscal rule and complete adherence to that rule in budget implement. What then are the shock effects of this rule on the real economic growth? The focus of this paper is on the examination of fiscal policy rule and economic growth in Nigeria. The structural VAR approach is utilized for achieving this objective between the period 1986 to 2019 using data and related variables sourced from the Central Bank of Nigeria (CBN) and the World Bank Development indicator (WDI). The key findings showed that total government expenditure on real GDP accounted for 49% and 42% of the shocks respectively. The finding further revealed that inflationary shock resulting from oil price changes accounted about 2%. This implies that changes in oil price may cause inflationary pressures on the economy in the short-run. The paper recommended among others, the need for policymakers to pursue a tight monetary policy via raising the Central Bank of Nigeria Monetary Policy Rate from its II.5% to 15% to 17% in the prevailing situation of high inflation rate and depreciated exchange rate so as to attract investment and to bolster economic growth in Nigeria

Keywords: Fiscal rules, fiscal governance, fiscal policy, SVAR, Nigeria.

INTRODUCTION

The main motivation behind rule-based fiscal policy is that discretionary fiscal policy can harm macroeconomic stability [1,2,3]. In a paper of a cross-section of 51 countries, [4] provided evidence that discretionary fiscal policy amplifies business cycle fluctuations and reduces the rate of growth, while rule-based fiscal policies help to lower output volatility and positively affect long-term economic growth [5].

Fiscal rule is loosely defined. In the widest sense, fiscal rule refers to 'budgetary institutions [6], or a set of rules and regulations according to which budgets are drafted, approved and implemented. In a narrower sense, the term refers to legislative restrictions on fiscal policy that set specific limits on fiscal indicators such as the fiscal balance, debt, expenditure, or taxation [7,8].

Meanwhile, experience in Nigeria has demonstrated the difficulties of implementing fiscal policy in an environment with highly volatile revenues-flows. In Nigeria, over the years, there has been a strong deficit bias in fiscal policy, driven largely by oil price development. However, a monocultural oil dependent economy like Nigeria faces two challenges when formulating fiscal policy as recorded in the literature: in the long-run, the need to ensure that fiscal stance is compatible with the sustainable use of oil and gas resources and in the short-run to medium term, the need to prevent the revenue volatility from spilling over into the budget [9].

In most of the past five decades, Nigeria's management of oil resources was poor and there is little to show in terms of economic development (productive investment) and poverty reduction. This reflects the key challenge to fiscal management in Nigeria from the inefficient use of public resources [10]. An effectively implemented rule could presumably play a role in overcoming these shortfalls on fiscal policy formulation by providing framework for predictable budget formulation, implementation and execution. In this regard, a fiscal rule could guide both the

medium-term expenditure framework (MTEF) and annual budget preparation. By imposing reasonable resource constraints for both the MTEF and the annual budget, the fiscal rule can bring them together, which will improve the consistency between medium-term planning and annual budgets [11]. The rule can also be designed to take directly into account the fiscal sustainability issues, which are not always explicit in the MTEF, given the importance of avoiding re-accumulation of unsustainable public debt [12,13].

The survey of the empirical literature on fiscal rule shows a number of interesting issues relating to country-coverage, the choice of the data and methodology and findings from previous papers. Therefore, the direction of the paper would pay attention to the following issues. First, the evidence from developing economies (Nigeria inclusive) has reviewed very little attention in the literature. Second, the survey has shown the importance of choosing an appropriate methodology and data set. The evidence from the advanced economies has further shown that whether using aggregate data or disaggregated data, the results are at best mixed [14,15]. Therefore, the point is to pay attention to whether the data are relevant to economic theory. Moreover, recent literature suggests the importance of testing the time series properties. The obvious questions to ask at this point are as follows and to which answers are not forthcoming from both researchers and policy makers in Nigeria. They are:

- What is the relationship between fiscal policy rule and long-term growth in Nigeria?
- What has been the effect of the oil-price based fiscal rule in insulating the economy against oil-related volatility?

The objective of the paper is therefore to investigate the relationship between fiscal rule and economic growth in Nigeria. Specifically, it seeks to examine the effect or otherwise of the oil-price based fiscal rule on economic growth in Nigeria [16,17].

Data and Methodology

Given the underlying objectives of the paper in estimating the effect of fiscal policy rule on economic growth inNigeria, the paper employed annual time series data from Nigeria for 1986 2019. The choice of data is premised on its availability. The data used in the estimation exercise are Real GDP (RGDP), oil price (OILP), total government expenditure (TOE), fiscal balance (FISCB), total debt (TOD), inflation (INF), broad money supply (MS/GDP), exchange rate (EXCH) and external reserve (EXR). Data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of various issues, Federal Ministry of Finance Nigeria and World Development Statistics (WDI).

Empirical Model Specification

This paper is located within the neoclassical economic growth theoretical framework and the model specification is adopted with modification from the empirical framework of [18,19]. The empirical model of Audu (2012) is specified as follows:

$InGDP_t = b_o + b_1InH + b_2In\ Ms_{2t}\ T\ b_3InEx_t + \varepsilon_t$ (1)

Where: $InGDP_t$ = log of gross domestic product at time t, InH_t = log of fiscal deficit at time t; $InMS_{2t}$ = log of broad money supply, $InEx_t$ = log of export and $b_1 - b_3$ represent the parameter coefficients. Similarly, [20] model is as follows:

$RGDP = \beta_o + \beta_1GFE + \beta_2FGR + \beta_3INF + \beta_4CIN + \mu_t$ (2)

Where: RGDP = Real Gross Domestic Product, FGE = Federal Government expenditure, FGR = Federal Government revenue, INF = inflation rate, CIN = capital inflow and μ_t = error term.Based on the above model expositions, the model of our study is specified as:

$InRGDP = K_o + K_1In\ OILP + K_2In\ ToE + K_3In\ FISCB + K_4InToD + K_5InINF + K_6InMS_2 + K_7InEXCH + K8InEXR + K_{9D+}\mu_t$ (3)

By theoretical postulations we expect the parameters of model 3 to satisfy the following sign restrictions.

$K_1, K_2, K_3, K_6, K_7, K_8 > 0$; $K_4, K_5 < 0$.

Variables Definition and Measurement

Aside traditional proxies for real gross domestic product (RGDP) as a scale variable for real output as a dependent variable [19], the remaining explanatory are measured as follows:

OILP: OILP, proxy for crude oil price for Nigeria. The choice of the oil price as a control variable is underscored by the fact that the Nigerian fiscal rule was adopted and anchored on the oil price.

FISCB: Fiscal balance, measured as the difference between expenditure and revenue in percentage of GDP. Fiscal balance is expected to impact positively on output.TOD: Total debt, measured as the sum of external and internal debts as a percentage of GDP. Total debt is assumed to impact negatively on GDP.

INF: Inflation rate measured by the average consumer price index (CPI). This is a monetary phenomenon. We assumed inflation to impact negatively on economic growth [20]. MS_2/GDP: Broad money supply, measured as the ratio of broad money supply to GDP. It measures the depth of the monetary sector. It impacts positively on output.

EXCH/EXR: Both exchange rate and external reserve are external sector variables. Exchange rate measures the ratio of the domestic currency to the major trading currency (US Dollar). Existing theoretical literature has provided a justification for a link between international reserve and fiscal policy. Again, there is also an indirect channel through which foreign reserves and fiscal policy can be related. A large stock of international reserves may improve a borrowing country's credibility and put the country in a better position to conduct countercyclical fiscal policy [21,22].

Empirical Technique and Procedures

To investigate the response of fiscal policy rule variables to innovations in economic growth, a Vector Autoregressive Model (VAR) is adopted. The VAR model provides a multivariate framework where changes in a particular variable (economic growth) are related to changes in its own lag and to changes in other variables and the lags of those variables. In particular, the Structural VAR (SVAR) model is explored. The SVAR is known to produce a better empirical fit than other forms of vector autoregressive models. More importantly, it provides a theoretical basis for analyzing the net effect of unexpected changes in one variable on other variables in the system. Essentially, the SVAR attempts to identify the variance decompositions and impulse response functions by imposing a priori restrictions on the covariance matrix of the structural errors and the contemporaneous and/or long run impulse responses themselves [23]. Only the relevant sections of the model are presented. Procedural, the linear and asymmetric transmission of fiscal policy rule shocks to economic growth can be captured with a VAR model of order K, thus

$$Y = \alpha_o + \sum_{i=1}^{K} A_t Y_{t-1} + \mu_t \quad (4)$$

Where: $Y_t = (Y_{1t}, Y_{2t}, \ldots Y_{nt})$ is an n x 1 vector of the endogenous variables in the model. Y_{t-1} is the corresponding lag term for order 1. A_i is an n x n matrix of auto regressive coefficients vector Y_{t-1} for 1 = 1, 2 ... k. $\alpha_o = (\alpha_1, \alpha_2 \ldots \alpha_n)$ is the intercept vector of the VAR model. $\mu_t = (\mu_{1t}, \mu_{2t} - \mu_{nt})^1$ is the n x 1 vector of while noise processes. K is the number of lagged terms. The literature suggests that the reduced form VAR model is lacking on explaining the contemporaneous coefficient matrix. As such, C_o is introduced into VAR model to form a SVAR of the order:

$$C_o T_t = \alpha_o + \sum_{i=1}^{K} C_i Y_{i-1} + \varepsilon \quad (5)$$

Where: C_o is a 6 x 6 non-identity matrix. Hence, the reduced from VAR in lag operator can be written as:

$$A(L) Y_t = \mu_t \quad (6)$$

And, the structural VAR model in lag operator from thus becomes:

$$CA(L) Y_t = C \mu_t = \varepsilon_t \quad (7)$$

Following the specification of the SVAR model of equation 7, certain restrictions are imposed on the model as follows:

1. A fiscal policy rule shock is exogenous at the contemporaneous period. (Proxy variables are: total government expenditure, fiscal balance, and total debt).
2. Real GDP is completely endogenous in the system. Therefore, it is determined by the fiscal policy rule variables and itself.
3. Inflation is assumed to be determined by the fiscal policy rule variables and shocks to it. This implies that a change in other variables can affect inflation rate in subsequent periods.
4. Broad money supply is partly endogenous. The assumption is premised on the fact that money supply is affected contemporaneously by inflate rate, oil price shock, fiscal policy rule variables and itself, but not by real GDP.
5. Exchange rate is partly endogenous. This is based on the assumption that exchange rate is affected oil price shock, inflation rate, external reserve and itself, but not by Real GDP?
6. External reserve is also partly endogenous. It is affected by total government expenditure, and total balance, inflation rate, exchange rate and itself, but not affected by real GDP.
7. Government expenditure: This is assumed to be determined by oil price and shocks to it.
8. Total debt: This is assumed to be determined by oil price, total government expenditure and the shock of itself.

Once the SVAR has been estimated, the relative importance of a variable in generating variations in its own value and in the value of other variables can be assessed (Forecast Error Variance Decomposition (VDC). VDC assesses the relative importance of fiscal policy rules in the volatility of other variables in the system. The dynamic response of long term economic growth to innovations in a particular variable can also be traced out using the simulated responses of the estimated VAR system (IRF). Thus, the IRF enables the determination of the dynamic effects of fiscal policy rule shocks on the long-term economic growth. In the SVAR model, the vector of variables, according to the Cholesky ordering, consists of oil price (OIlP), total government expenditure (TOE), fiscal balance (FISCB), total debt (TOD), inflation (INF), broad money supply (M_2/GDP), exchange rate (EXCHR) and external reserve (EXR):

$$Y_t = [OILP, TOE, FISEB, TOD, INFR, M_2/GDP, EXCHR, EXR] \quad (8)$$

The innovations of current and past one-step ahead forecast errors are orthogonalised using Cholesky decomposition so that the resulting covariance matrix is diagonal. This assumes that the first variable in a pre-specified ordering has an immediate impact on all variables in the system, excluding the first and so on. In fact, pre-specified ordering of variables is important and can change the dynamics of a VAR system.In line with the ordering, the oil price changes are ranked as a largely exogenous variable, especially for the Nigerian economy. Nigeria is one of the major suppliers of crude oil to the international market, meanwhile; production and export quota are predetermined by the Organization of Petroleum Exporting Countries (OPEC) criteria, and production activities and challenges down home. Moreover, demand for crude oil is largely determined by global economic growth and energy intensity within the industrialized countries. Therefore, oil price is exogenous to the Nigerian economy. It is expected that significant shocks in oil markets affect contemporaneously the other key variables of the SVAR model [24, 25].

Government expenditure is the second variable. Government expenditures can be defined concisely as recurrent and capital expenditure. Recurrent expenditures include expenditures include expenditures on government employees, subsidies and contractors fees among others, while capital expenditure adds to the investment/infrastructure compositions of the domestic economy.

Long-term economic growth is also affected instantly by the level of government demand. The positive development in oil prices results to increase in revenue and government expenditure. The increase in inflation results in real effective exchange rate appreciation. The real effective exchange rate measures the relative prices of non-tradable goods to tradable goods and is a measure of the competitiveness of the Nigerian economy. If domestic prices increase, while prices remain unchanged, this would increase the relative prices of non-tradable leading to a fall in the competiveness of an economy [26,27,28,29,30,31].

Results and Discussion

The results presentation starts with the time series properties of the variables used for the estimation. The aim of examining the time series properties of the included variable is to avoid spurious estimation and to ensure that the variables are not spuriously correlated.

Unit Root Results

The estimation begins by conducting stationarity test to ascertain the stationarity or otherwise of the variables and the appropriateness of the specification for SVAR estimation. Thus, the Augmented Dickey Fuller (ADF) and the [28] tests are employed. The ADF-and PP-tests are reported in Table 1. The results show that the variables in their levels are non-stationary. Since the variables in the SVAR model follow an I (1) process, the next is to examine if long run relationship (cointegration) exists among the variables. To achieve the co-integration test purpose, the Johansen maximum-likelihood approach is utilized. Following, [15], the issue of intercept and trend were included in the model.

Table 2: Stationary/Unit Root Test

	ADF				**PP**			
	Without Trend		With Trend		Without Trend		With Trend	
	Level	First Diff	Level	First Diff	Level	First Diff	Level	First Diff
OilP	-0.76	-4.62***	-2.00	-6.34***	0.81	-16.43***	2.01	-17.6***
TOE	-2.56*	-4.05***	-2.16	-6.13***	-2.01*	-15.45***	-2.03	-15.6***
FISCB	-121	-11.69***	-2.01	-11.6***	-1.34	-11.23***	-3.43	-11.5***
TOD	-3.06**	-6.32***	-3.01*	-8.26***	-3.30	-8.76***	-2.03	-9.12***
INF	-1.05	-18.13***	-1.32	-16.3***	-1.23*	-35.8***	-4.12*	-42.51***
M^2/GDP	-0.68	-6.42***	-2.45	-7.6***	-0.76	-30.7***	-8.72**	-28.34***
EXCHR	-2.04	-14.14***	-1.65	-8.45***	-8.53***	-25.6***	-8.56***	-31.31***
EXR	-8.76***	-10.04***	-6.98**	-15.4***	-7.82***	-25.7***	-9.5**	28.65***

Source: Researcher's Computation using E-view 10.0 [Econometric view]

Note: *, **, *** represent significance at 10, 5 and 1 percent respectively.

The number of co-integrating relations from the SVAR model, on the basis of trace statistics and the maximal eigenvalue statistics using critical values from [26] at 5 percent level are presented in Table 2. The procedure explored to determine the number of co-integrating vector begins with the hypothesis that there are no co-integrating vectors and with trends, H^+ A rejection of the hypothesis would lead to testing the alternative hypothesis of no co-integrating vectors, and no trend H.

Table 3: Co-integrating Results (Long-Run Relationship)

Maximal Eignevalue Statistics			Trace Statistic		
Rank	H+	H	Rank	H+	H
r = 0	118.44***	121.23***	r = 0	150.34***	128.64***
r = 1	76.32***	78.64***	r = 1	132.64***	86.24***
r = 2	63.54	48.35	r = 2	56.20	32.17
r = 3	7.44	15.28	r = 3	7.24	9.26
r = 4	0.73	3.65	r = 4	0.64	1.92

Resource: Researcher's Computation using E-view 10.0
Note: *** indicates 1 percent confidence level.

Test statistics indicate that the hypothesis of no co-integration among the variables can be rejected. The results show that at least two co-integrating vectors exist among the variables of interest. The optimal lag length is 4. In addition, since the variables are co-integrated the equations of the SVAR also included the lagged values of the variables in levels to capture their long-run relationships.

Variance Decomposition

The results are summarized in Table 3, the graphical movements of the impulse responses are not presented. The essence of the variance decomposition is that it measures the proportion of the forecast error variance in one variable explained by innovations in it itself and the other variables. The SVAR was estimated with the sets of contemporaneous structural restrictions specified in the SVAR equations.

Table 4: Variance Decomposition

Quarter	RGDP	OILP	TOE	FISCB	TOD	INF	M^2/GDP	EXHR	EXR
Variance decomposition for OILP									
1	76.0	90.27	9.27	0.01	0.02	0.02	0.00	0.00	0.01
4	72.24	76.15	7.15	7.93	2.71	4.86	4.72	3.48	1.24
8	68.80	66.42	6.42	11.42	2.48	12.63	12.49	2.34	12.62
12	50.31	58.56	5.56	15.05	2.76	12.84	10.60	0.65	10.72
Variance decomposition for RGDP									
1	7.01	6.31	95.36	86.44	72.48	0.02	0.06	0.24	0.40
2	17.51	5.05	82.72	72.86	66.52	0.56	3.24	0.22	0.24
3	12.21	4.74	76.46	92.75	74.01	13.21	11.56	3.56	1.48
4	8.08	4.84	82.53	76.43	78.46	10.09	11.24	4.72	6.23`
Variance decomposition for TOE									
1	49.21	2.93	95.12	0.23	1-24	0.00	0.01	0.42	1.48
2	42.13	4.76	87.23	0.35	6.58	6.51	5.24	0.36	0.25
3	34.02	4.15	71.24	0.41	5.02	4.68	4.24	1.29	2.08
4	33.06	3.42	76.49	0.78	5.82	3.24	6.01	6.48	7.24
Variance decomposition for FISC B									
1	60.42	0.01	0.48	96.25	0.48	0.01	0.48	1.42	2.01
2	5.62	0.24	0.23	86.48	0.24	0.24	2.25	1.05	2.05
3	13.21	1.25	0.24	72.01	1.86	1.25	1.08	2.48	1.06
4	6.32	2.32	1.48	68.52	2.44	6.48	1.62	1.20	1.72
Variance decomposition for ToD									
1	96.01	2.12	0.01	0.03	86.24	0.01	0.42	1.27	1.52
2	70.01	10.23	0.22	0.02	76.32	2.23	1.11	0.48	8.03
3	80.87	12.23	0.51	0.15	59.82	4.21	2.25	3.25	5.43
4	86.21	22.01	0.58	0.08	34.07	2.10	3.26	1.20	2.89
Variance decomposition for INF									
1	0.21	2.11	3.24	4.24	1.40	56.40	1.03	2.48	1.13
2	0.56	3.24	1.48	1.28	2.41	86.28	1.09	1.49	2.46
3	0.32	1.03	1.92	2.56	3.24	74.01	2.01	3.25	1.72
4	1.40	2.06	0.43	2.48	1.79	64.23	3.03	0.84	0.86
Variance decomposition for MS/GDP									
1	42.52	1.02	1.62	0.24	1-06	0.24	78.63	1.24	1.21
2	32.05	1.06	1.41	0.65	2.45	2.49	68.40	1.05	2.51
3	46.52	0.24	0.25	2.52	3.25	3.34	57.98	1.08	3.76
4	36.48	1.16	1.65	1.48	2.45	1.06	63.24	2.48	4.24
Variance decomposition for EXHR									
1	11.24	34.06	9./72	1.40	1.28	1.20	1.48	98.43	1.20
2	32.23	24.98	7.25	4.25	2.41	1.40	2.01	82.51	1.48
3	48.06	36.32	6.28	3.20	3.25	2.32	1.72	98.29	0.21
4	15.25	16.50	5.40	4.21	0.48	1.48	3.24	46.35	3.25
Variance decomposition for EXR									
1	0.01	11.24	10.21	1.46	1.48	10.24	1.05	0.43	76.58
2	0.24	10.25	11.46	2.35	3.25	11.07	2.48	0.24	86.01
3	1.24	9.86	23.24	9.76	4.00	10.03	3.25	0.56	76.45
4	4.28	7.24	16.01	7.21	3.24	12.48	4.86	1.24	86.24

Resource: Researcher's Computation using E-view 10.0

Discussions and Implications for Findings

Outputs: The variance decomposition indicates that real GDP's own shock ranges from 76 percent in the first and second quarters. It started declining from the 3rd quarter down to the 4th quarter. The variables of fiscal policy rule, particularly total government expenditure had 90 percent shock on real GDP in the first quarter and declined to 59 percent in the 4th quarter. This implies that

government expenditure over a particular period has a significant effect on economic growth

Oil Price (OILP): The variance decomposition suggests that its own shock (oil price shock) accounted for 90 percent in the 1st quarter and 58 percent in the 4th quarter. Meanwhile, shocks of real GDP to oil price ranges from 76 percent to 50 percent in the 4th quarter. This implies that there is a relationship between oil price and the Nigerian economy. This follows the reasoning that oil revenue is the major source of earning or revenue to the Nigerian economy and the fact that the Nigerian economy depend over 80 percent on the oil sector. This implies that, the Nigerian economy needs to be diversified to reduce the oil price shock and vulnerabilities.

Total Government Expenditure (TOE): The shock of total government expenditure on real GDP accounted for 49 and 42 percents respectively in the 1st and 2nd quarters respectively. Subsequently, the shock declined from 34 percent to 33 percent in the 3rd and 4th quarters. The shock of other variables of the SVAR model ranges from 7 percent to 0 percent within the time horizons. From the result of Table 3, the highest effect of oil price shock on government expenditure is 5 percent in the second quarter. Although minimal, it confirms the monetization of crude oil receipts in Nigeria. It is expected that the shock of oil prices to total government expenditure will be reduced through the Nigerian stabilization fund-the Sovereign Wealth Fund (SWF).

Fiscal Balance (FISCB): The variance decomposition result of fiscal balance show that its own shock accounted about 96 percent in the first quarter to 72 and 68 percents respectively in the 3rd and 4th quarters. From the result also and bearing in mind our concern-fiscal policy rule and economic growth, the shock of fiscal balance on economic growth ranges from 60% in the 1st quarter to 5 percent in the 2nd quarter. This implies that the shock of fiscal balance on real GDP may be temperate and may not last long as shown in the Table of the variance decomposition.

Total Debt (TOD): The variance decomposition estimates show that the shocks of total debt, which is a combination of domestic and foreign debt accounted about 96 percent in the first period to 86 percent in the last period. Total debt own shock ranges from 86 percent in the 1st period to 34 percent in the last period. The implication of this finding shows that public debt has a crowd-out-effect on the economy and therefore should be minimized optimally.

Inflation (INF): A clear feature of the variance decomposition is the finding that the shock of inflation on real GDP accounted for 2 percent in the 1st quarter to 14 percent in the 4th quarter. This finding supports the negative effect of inflation on economic growth. Looking at the relationship between inflation and oil price, the variance decomposition results show that inflation shock resulting from oil price ranges from 2 percent in the 1st quarter to 1 percent in the 3rd quarter. This finding supports the assertions of [11] and [23] that oil price may cause inflationary pressures in the short-run. To insulate the economy and inflationary tendencies of oil price, there is need for increase in production of exportable goods via the instrument of diversification.

Broad Money Supply (M^2/GDP):The variance decomposition Table 5 shows that the shock of broad money supply to real GDP accounted for 43 percent in the 1st quarter, and declined to 36 percent in the 4th quarter. Its own shock ranges from 78 percent in the 1st quarter to 57 percent in the 3rd quarter. Oil price shock did not contribute to the shocks in money supply in the 3rd quarter. This finding is in line with that of [8] and [9].

Exchange Rate (EXHR): The results show that exchange rate shock on itself accounted for 98 percent in the 1st quarter and 46 percent in the 4th quarter. The shock of exchange rate to real GDP accounted for 48 percent in the money supply contributed about 3 percent of the forecast error variance to real exchange rate in the 4th quarter. This is as inflation contributed an average of 2 percent to real exchange rate over the 3rd quarter.

This finding lends supports to the findings of [5]. From the result also, oil price shock accounted about 34 percent in the 1st quarter to 16 percent in the 4th quarter. The decline is confirmatory of the fact that high oil price may give rise to wealth effects that may eventually appreciates the exchange via de-industrialization of the tradable sector, a situation of 'Dutch-disease' in Nigeria.

External Reserve (EXR): The variance decomposition shows that the shock of external reserve on real GDP is insignificant in the 1st and 2nd quarters unlike in the 3rd and 4th quarters. Meanwhile, the shock of external reserve to itself ranges from 76 percent in the 1st quarter to 86 percent in the 4th quarter. On the relationship between oil price and external reserve, the table shows that oil price contributed about 11 percent in the 1st quarter to 7 percentage in the 4th quarter. Oil price has a major effect on Nigerian external reserve accumulation, since Nigeria depend mostly on oil export. The shock of exchange rate was insignificant to external reserve in the 1st and 2nd, 3rd quarters respectively. This implies that external reserve accumulation has an effect on the value or de-value of the domestic currency.Reliability and model stability tests were carried out to ensure the statistical/econometric relevance of the estimates.

CONCLUSION

This paper attempted to examine the effects of fiscal policy rule on long-term economic growth in Nigeria from the period 1986 to 2019. Specifically, it investigate how the shocks of oil price, total government expenditure, fiscal balance, total debt (fiscal rule variables), inflation dynamics, broad money supply, real exchange rate and external reserve influence economic growth (real GDP). To achieve this objective, the paper utilized the structural VAR model with restrictions and in line with the Cholesky ordering. The key finding show that the shock of total government expenditure on real GDP accounted about 49 percent and 42 percent of the shocks respectively while the explanatory variable accounted about 7 percent to 0 percent within the time horizon. Further findings reveal that total debt accounted for 96 percent to 86 percent of the shock on real GDP changing on oil price shock account for 90 to 50 percent negative growths. This implies that government debt crowd-out-real GDP. Intuitively, for the Nigerian economy to growth significantly, the government needs to improve on growth enhancing factors, mostly expenditure on infrastructure, while reducing the accumulation of debt because of high servicing of debts. The paper is limited by the availability of data, although the Central Bank of Nigeria CBN Bulletin (CBN) and World Bank Development Indicator were used when necessary.

RECOMMENDATIONS

In line with the empirical evidence of shock on real GDP by the control explanatory variables and as part of a policy blue print for fiscal policy strategies to stimulate economic growth in the Nigerian economy, the followings are recommended:

i. Diversification is germane to the export growth of the Nigerian economy. The findings of the paper reiterate the importance of diversifying the economic base so as to reduce the shock of fiscal policy on economic growth in the medium to the long-run.
ii. Infrastructure Provision: Infrastructure provision needs to improve in Nigeria through public finance expenditure channels. This no doubt will improve and sustain economic growth.
iii. Reduction in total debt: Debt per say has debilitating effects on economic growth. The government and agency of the Government for Debt management should monitor profile the debt profile seriously as to ensure that the public debt is reduced. If possible, moratorium will place when appropriate to reduce the

quest by the Federal Government and federating units.

iv. Monetary policy is an ineffective tool for reversing pure supply side shocks to prices. Consequently, supply side shocks especially that affect food prices and exchange rate will have serious long term consequences for inflation, long after the shocks have dissipated. It is suggested therefore for a tightening monetary policy via raising the Central Bank Monetary Policy Rate (MPR) to 15% to 17% in the current to the long-term in Nigeria so as stabilize the real interest rate and to attract investment.

REFERENCES

1. Aaskiven, L. & Wiese, R. (2018). How fiscal rules matter for government debt reduction: Theory and Evidence University of Essex, Department of Government and University of Groningen, Department of Economics and Business.
2. Agu, S.U., Idike, A., Okwor, I. &Ugwunta, D. (2014). Fiscal Policy and Economic Growth in Nigeria: Emphasis on various components of Public Expenditure. *Singaporean Journal of Business Economics and Management Studies* 2 *(12):* 37-54.,
3. Alesina, A. &Bayoumi, T. (1996). The costs and benefits of fiscal rules: Evidence from the United States'. NBER Working Paper No. 5614. Cambridge, MA: National Bureau of Economic Research.
4. Alesina, A. &Perotti, R. (1999). 'Budget deficit and budget institutions'. In James M. Poterba and Jurgen Von Hagen, ells., Fiscal Institutions and fiscal performance. Chicago: NBER/University of Chicago Press.
5. Amano, R. & Van Norden, S.(1998) Oil price and Exchange Rates, *Review of International Economics, 3(2): 10-21*
6. Barsky R.B & Kilian, L.(2004) Oil and the macro economy Since the 1970s.NBER Working Paper 10855. Available at http://www.nber.org/paper/W10855.
7. Bayoumi, R. &Eichengreen, B. (1995). 'Restraining yourself. The implications of fiscal rules for Economic stabilization'. IMF Staff Papers 42 (1): 783-791.
8. Bernanke, B.S., Gertler, M. & Watson, W.(1997) Systematic Monetary Policy and the Effects of oil price shocks. Brookings Paper on Economic Activity, 1:91-148
9. Bohi, D.R.(1991) Energy, price shock and macroeconomic performance. Washington, D.C: Resources for the Future.
10. Dada, E.(2011) Oil price shock and Macroeconomic Aggregates in Nigeria, *Central Bank of NigeriaEconomic and Financial Review, 49(2): 49-72*
11. Dickey, D, A & Fuller, W.A.(1979) Distribution of the Estimator for Autoregressive Time Series with a Unit Root . *Journal of the American Statistical Association, 74:427-431*
12. Engle, R.F. & Granger, C.W.J.(1987). Co-integration error-correction: representation, estimation and testing. Econometrica. 55*(2).* Exploration's in Natural Resources Economics, John Hopkins University Press, PP. 251-276.
13. Fata's, A. &Mihov, I. (2003). 'The case for Restricting Fiscal Policy Discretion'. *Quarterly Journal of Economics* 118 (4): 1419-1447.
14. Halal, M. &Yared, P. (2018). Fiscal rules and discretion in a world economy. American Economic Review 108 (8): 2305-2334, http://doi.org/10.1257/aer.20151180.
15. Harris, R.I.D.(1995) Using co integration Analysis in Econometric Modeling, New York, Prentice Hall
16. Hausman, R., Gavin, M., Perotti, R. &Talvi, E. (1996). Managing fiscal policy in Latin America and the Caribbean: Volatility, procyclicality and limited creditworthiness.

Working paper 326, office of the Chief Economist, Inter-American Development Bank.
17. Kehinde, A.O. & Adebanjo, D.A. (2014). Modelling the Dynamic Trends of Privatization and aggregate electricity consumption in Nigeria. A Bound Test Approach. In proceeding of the 2014 NAEE/IAEE conference.
18. Kennedy, S. & Robbins, J. (2001). 'The Role of Fiscal Rules in Determining Fiscal Performance'. Department of Finance Working Paper 2001-16, Government of Canada, Ottawa.
19. Levinson, A. (1998). 'Balanced Budgets and Business Cycle: Evidence from the States'. *National Tax Journal.* 51*(4):* 715-732.
20. Narayan, P.K. (2005). Reformulating critical values for the bound F-statistics approach to cointgration: An application tot eh tourism demand for Fiji. Discussion Paper No. 02/04. Department of Economics, Monarch University, Victoria 3800.
21. Ng, S. & Perron, P. (2001). Lag length selection and the construction of unit roof tests with good and power. Econometrica. 69: 1519-1554.
22. Nnaji, C.E., Chukwu, J.O. &Ukwueze, E.R. (2011). Fiscal Policy and the Management of Foreign reserves in the Nigerian economy (selected papers of the 51st Nigerian Economic Society Annual Conference-2010).
23. Olarinde, M.O. &Omojolaibi (2014). Electricity consumption and Economic Growth in Nigeria: What does the Evidence say? In proceedings of the 2014 NAEE/IAEE conference.
24. Ono, T. (2019). Fiscal rule in a monetary economy: Implications for growth and welfare.
25. Onofei, M., Gavriluta, A., Bostan, I., Oprea, F., Paraschir, G. & Lazar, C.M. (2021). The implication of fiscal principles and rules on promoting sustainable public finances in the EU countries. Sustainability 12:2772; doi:10.3390/su12072772 www.mdpi.com/journal/sustainability.
26. Osterwald-lenum, M.(1992) A Note with Quantiles of the Asymptotic Distribution of the maximum likelihood cointegration rank test Statistics, *Oxford Bulletin of Economics and Statistics, 54: 481-472*
27. Pesaran, M.H., Shin, Y. & Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics.(16):* 289-326.
28. Phillips, P.C & Perron, P.(1988) Testing for a unit Root in Time Series regression. *Biometrika 75: 335-346*
29. Rotemberg, J.J & Woodford, M.(1996) Imperfect Competition and the Effect of Energy prices. *Journal of Money, Credit and Banking, 28:549-577*
30. Sacchi, A. &Salotti, S. (2015). The impact of national fiscal rules on the stabilization function of fiscal policy. Government and Economics Research Network and Oxford Brookes University (UK).
31. World Bank, (2005). Fiscal sustainability in theory and practice: A Handbook. The World Bank.