FISCAL POLICY AND PERFORMANCE OF MACROECONOMICVARIABLES IN NIGERIA: A VECTOR ERROR CORRECTION MODEL (VECM) APPROACH

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ABSTRACT

This paper is set out to examine the relationship that exists between fiscal policy tools i.e Government Expenditure (GEX), Government Tax Revenue (GTR) and Total Debt Stock (TDS) and key macroeconomic indicators for the period 1980 to 2017. The selected macroeconomic indicators are Economic Growth (GDP), Inflation (INF) and Unemployment (UMP). The study is an attempt to evaluate how these fiscal policy tools explain the selected macroeconomic variables in Nigeria. The scientific method adopted for this investigation is multiple regression analysis. However, the study carries out some diagnostic tests which include unit root test, cointegration analysis, vector error correction model (VECM) and granger causality test. The vector error correction model was employed to estimate both the shortrun and long run relationship between the regressor and the regressand. The results obtained indicate that government expenditure has significant positive relationship with GDP, while government expenditure and total debt stock have significant negative long run relationship with unemployment. The granger causality test established a unidirectional causality running from fiscal policy tools to the selected macroeconomic variables in Nigeria. Based on the findings, the researcher made the following suggestions: government should increase expenditure on capital project like infrastructure, borrowed fund should be invested properly and intensify fight against corruption as possible ways of putting the economy on the wheel of rapid growth and development

Keywords: Government expenditure, Government tax revenue, Total debt stock, Inflation, Unemployment

INTRODUCTION

Nigeria is a country enormously gifted with both natural and human resources. The pool of resources from one end to the other is immeasurable to such an extent that given a vibrant and perceptive fiscal policy, economic growth, development and prosperity would have been long achieved, Imoisi (2013). Fiscal policy as a tool for macro-economic management, according to Akpapan (1994), is a purposeful use of government revenue (mainly from taxes) and expenditure to manipulate the level of economic activities in a country. The use of fiscal policy is very paramount in every society, most especially in the less developed countries (LDCs) as a major tool for stabilization and for development to be sporadic.

Fiscal policy is used in gearing the economy towards achieving a variety of economic transformation such as economic development and growth, price stability, reduction in unemployment, external equilibrium as well as income redistribution. Fiscal policy was not generally recognized as important until the birth of Keynessian Economics in the mid-nineteen thirties (1930s) which enhanced its significance as a policy tool to overcome the economic depression of Western Europe and North America. The threat of inflation in the

immediate post-war years and the desire to maintain continuous full employment following World War II necessitated the use of fiscal policy in these same economies. In more recent years however, the general disenchantment over the limited success in the achievement of the above objectives has brought into sharp focus the question of the effectiveness of fiscal policy in relation to other policies, especially monetary policy and the consideration as to whether or not the continued heavy reliance on fiscal policy as an economic stabilization tool is desirable.

Nigerian public expenditure can broadly be categorised into capital and recurrent expenditure. The recurrent expenditure are government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas expenses on capital projects like roads, airports, education, telecommunication, electricity generation etc., are referred to as capital expenditure. One of the main purposes of government spending is to provide infrastructural facilities. The effect of government spending on economic growth is still an unresolved issue theoretically as well as empirically. Although the theoretical positions on the subject are quite diverse, the conventional wisdom is that a large government spending is a source of economic instability or stagnation. Empirical research, however, does not conclusively support the conventional wisdom. A few studies report positive and significant relation between government spending and economic growth, while several others find significantly negative or no relation between an increase in government spending and growth in real output.

STATEMENT OF THE PROBLEM

Fiscal policy is known to be relevant in revamping and stabilizing a depressed economy as it plays significant role in effective employment of resources, reduction of poverty, control of inflation among others. But various studies have opposed the ability of fiscal policy to counteract and reposition the distortions in the Nigerian economy. Advocates of the Classical economists argue that fiscal policy cannot, in the long term, affect the level of real output (GDP). However, the Keynesian economists maintain that fiscal policy can affect the level of output. Besides, different scholars have carried out empirical studies into the impact of fiscal policy instrument on the performance of macroeconomic variables. However, their submissions have been conflicting, For instance Agiobenebo (2003), Gbosi (2008) and Adeoye (2011) have shown the inability of fiscal policy to play the needed stabilization role. In other hand, some researchers believe that fiscal policy are positively related with output growth (Agu, 2014; lance, 2012; Audu, 2012 and Okafor, 2012). It is therefore a core research issue and this is the pivot of this study. Currently, there is no consensus on the matter. The level of economic development and the fiscal structure of Nigeria compound this problem.

Against this background, the interest to study fiscal policy was sparked, given the prominence of fiscal policy in macroeconomic management in Nigeria. Moreover, the link between fiscal policy and macroeconomic performance has been of interest to academicians and policy makers because there have never been an agreement on the effect of fiscal policy on macroeconomic performance. For instance, studies on this literature reveal conflicting and inconclusive evidence that raises doubts about the precise relationship. This is because of the mixed results observed due

to the models, countries, research methods and data employed as evident in these studies (Peter, 2003; Omitogun & Ayila, 2007; Medee & Nenbee, 2011; Okafor 2012, and Abdurrauf, 2015). The glaring limitations identified in these studies are the methodological issues. For example, Peter (2003), & Abdulrauf (2015), draw a conclusion on a regression suspected to contain a random walk process (unit root), while Ayila (2007) draw a conclusion on a regression suspected to have untreated data (some variables used were in real, some in nominal value) . This indeed is a research gap. It is an effort to correct the above identified gaps that motivated this study.

OBJECTIVES OF THE STUDY

The main objective of this study is to examine the effect of fiscal operations of government on selected macroeconomic variables which are — Gross Domestic Product, Inflation and Unemployment in Nigeria. To achieve this aim, the study is guided by the following specific objectives:

1. Determine if government expenditure, government revenue and government borrowing predict economic growth (GDP) in Nigeria.
2. Examine to what extent government expenditure, government revenue and government borrowing explain inflation in Nigerian.
3. Investigate if there is significant long run equilibrium relationship between government expenditure, government revenue and government borrowing and unemployment in Nigeria.
4. To establish or not if there is any significant causal relationship between fiscal policy tools and macroeconomic variables in Nigeria.

RESEARCH HYPOTHESES

This study is guided by the following hypotheses

1. There is no significant relationship between economic growth and fiscal policy variables (government expenditure, government tax revenue and government borrowing in Nigeria)
2. There is no significant relationship between inflation and fiscal policy variables (government expenditure, government tax revenue and government borrowing in Nigeria)
3. There is no significant relationship between unemployment and fiscal policy variables (government expenditure, government tax revenue and government borrowing in Nigeria)
4. Causality does not significantly run from fiscal policy tools to selected macroeconomic variables in Nigeria.

THEORETICAL LITERATURE

The Keynesian Theory of Fiscal Policy

Fiscal policy is based on the Keynesian theories also known as Keynesian economics. The theory is linked to the English economist; John Maynard Keynes. This theory basically states that governments can influence macroeconomic productivity levels by increasing or decreasing tax levels and public spending. This influence, in turn, curbs inflation (generally considered to be healthy when between 2-3%), increases employment and maintains a healthy value of money. Fiscal policy is very important to the economy. For example, in 2012, many Americans worried that the fiscal cliff, a simultaneous increase in tax rates and cuts in government spending set to occur in January 2013, could send the U.S. economy back to recession. The U.S. Congress avoided this problem by passing the American Taxpayer Relief Act of 2012 on Jan. 1, 2013 (Heakal 2013).

WAGNERS THEORY (LAW OF INCREASING STATE ACTIVITIES)

Adolph Wagner studied the German economy over time and observed a correlative growth of

national output and public expenditure in the economy. He expressed the view that there was an inherent tendency of the activities of the government to increase in size.

He expresses the view that public expenditures increase at a faster rate than national output i.e. that the share of the public sector in the economy will increase as economic growth proceeds.

PEACOCK AND WISEMAN'S HYPOTHESIS OF DISPLACEMENT EFFECT

Allan Peacock and Jack Wiseman studied the growth of public expenditure in the U.K for the period 1890 — 1955. They came up with an alternative hypothesis of the growth of public expenditure different from what Wagner proposed. Peacock and Wiseman's hypothesis is popularly referred to as displacement effect hypothesis. The core argument is that public expenditure does not increase in a smooth and continuous manner but in a stepwise fashion.

Peacock and Wiseman argued that countries experience upheavals of various types. During these upheavals, there is need for increased public expenditure over and above the existing public revenue. This mounts a serious pressure on the government and the people to accept a higher level of sacrifice by withdrawing more resources from the private to the public sector. In doing so, public expenditure displaces private expenditure during the period of disturbance. Thus, there is movement from a lower level of public expenditure and revenue to a higher level. And so government expenditure and revenue are displaced upwards. This is the main thrust and the essence of the displacement effect hypothesis

MUSGRAVES THEORY OF PUBLIC EXPENDITURE GROWTH

Musgrave thinks that the income elasticity of demand for public goods and services is the major determinant of public expenditure growth. He grouped consumers into three based on per capita income as follows.

1. Those at low level of per Capita Income typical of pre-industrial society in developing countries. At this level, demand for goods and services tend to be generally very low because nearly all income is devoted to satisfying primary needs. Public expenditure is therefore very low.
2. As per Capital Income starts to rise above these low levels, the demand for public goods and services usually provided by the government, such as education, health, electricity, potable water, etc begin to rise thereby compelling the government to provide more of them and so increasing expenditure on them. This explains the growth of public expenditure in the state at that level. This is the early stage of economic development.
3. At very high levels of per Capita Income characteristic of developed economies, basic wants have been satisfied; and sometimes by the private sector. The rate of growth of the public sector then tends to fall.

EMPIRICAL LITERATURE

Abubakar (2016), carried out a disaggregate analysis of the impact of public spending on economic growth of Nigeria by employing the Vector Error Correction Model, VECM methodology. Findings of his study showed public expenditure as having a mixed effect on economic growth. Some components of public expenditure exerted a negative effect, while other components had a positive impact on economic growth of Nigeria.

Abdulrauf (2015), examined the short run and long run impacts of fiscal policy on Nigeria's economic development by employing the Vector Error Correction Model (VECM) methodology using annual

data series from 1981 to 2013. His findings showed government recurrent expenditure and government investment as having a positive short run and long run impacts on economic development, while capital expenditure only had a short run positive impact. Tax revenue was found to have a negative relationship with economic development of Nigeria both in the short run and long run.

Agu (2014), wrote on fiscal policy and economic growth in Nigeria. Their major aim was to determine the extent to which Nigeria fiscal policy has impacted on the economy of Nigeria with emphasis on the impact of various components of public expenditure on the economy. In the study, annual data spanning a period of forty nine years from 1961 – 2010 were used. Data were obtained from C.B.N statistical bulletin; they adopted a generic regression equation. Their result showed a positive correlation between government expenditure on economic services and economic growth.

Egbetunde & Fasanya (2013), delved into the Public Expenditure and economic Growth in Nigeria: Evidence from Auto-Regressive Distributed Lag Specification during the period 1970-2010. The Bounds approach to cointegration was used in the analysis to examine the long run and short run relationships between public expenditures and economic growth. The ARDL approach signifies that the variables are bound together in the long-run. The study reveals that recurrent expenditure has significant impact on growth; total public spending has negative effect on growth.

Omitogun & Ayinla (2007), examined empirically the contribution of fiscal policy in the achievement of sustainable economic growth in Nigeria. They used Solow growth model estimated with the use of ordinary least square method and found out that fiscal policy has not been effective in the area of promoting sustainable economic growth in Nigeria. They suggested that Nigerian government should put a stop to the incessant unproductive foreign borrowing, wasteful spending and uncontrolled money supply and embark on specific policies aimed at achieving increased and sustainable productivity in all sectors of the economy.

METHODOLOGY

Research Design

This study adopted Causal Research Design. The reason for choosing this design type is that it helps the researcher to determine whether one time series is useful in forecasting another or measure what impact a specific change will have on existing norms or assumptions.

The aim of the study was to determine the correlation among macroeconomic variables which include, economic growth (GDP), inflation rate (INF), unemployment (UMP) as the dependent variables and Government Expenditure (GEX), Government Revenue (GTR), and Total Debt Stock (TDS), as the independent variables.

Nigerian annual time series data spanning from 1980 to 2017 was employed to determine how these fiscal policy tools predict economic growth, inflation and unemployment. The study covered the period 1980 – 2017, period of (37) years believed to be long enough to account for the long run relationship among the series under consideration in Nigeria.

The principal instrument used to estimate the specified model was the vector error correction model (VECM) which is believed to be the most reliable for multivariate time

series analysis (Igbatayo & Agbada, 2012). VECM was used to determine the short run and long run dynamics of the series in the model. Other methods adopted for the present study to ensure quality results include however, Augmented Dickey-Fuller unit root test procedure, to examine whether macroeconomic variables in the model are co-integrated of order one 1(1) or not. The Granger causality (GC) test followed and was used to establish whether or not there was any feedback effects among the variables considered.

MODEL SPECIFICATION

Again, the primary analytical tool used for this study is Vector Error Correction Model (VECM). Basically, VECM is used to determine the short run and long run dynamics of the series in the model. As noted by Koutsoyannis, (2003), "the Vector error Correction model (VECM incorporates both the long run and short run effects simultaneously"

MODEL SPECIFICATION FOR OBJECTIVE ONE

To determine if government expenditure, government revenue and government borrowing predict economic growth in Nigeria within the sample period. The researcher specified the model below to address the above stated objective. The model that will capture this relationship is as follows:

$GDP_t = \beta_0 + \beta_1 GEX_t + \beta_2 GTR_t + \beta_3 TDS_t + \varepsilon_{1t}$ (1)

Where;

GDP_t = Value of Gross Domestic Product at time

tGEX_t = Government Expenditure at time t

GTR_t = Government Revenue at time t

TDS_t = Government Borrowing proxied by Total Debt Stock at time t

$\beta_0 - \beta_3$ refers to the parameters to be estimated

ε_t = omitted variable

MODEL SPECIFICATION FOR OBJECTIVE TWO

The second objective for this study is to determine the effect of government expenditure, government revenue and government borrowing on inflation in Nigeria from 1980 to 2017. The structural model that addressed this objective is specified as shown below:

$INF_t = \alpha_0 + \alpha_1 GEX_t + \alpha_2 GTR_t + \alpha_3 TDS_t + \mu_{2t}$ (2)

Where;

INF_t = Inflation rate at time t

GEX_t = Government Expenditure at time t

GTR_t = Government Revenue at time t

TDS_t = Government Borrowing proxied by Total Debt Stock at time t

μ_{2t} = omitted variable

α_0 - α_3 = parameters estimated.

MODEL SPECIFICATION FOR OBJECTIVE THREE

The third objective of this study is to identify the effect of government expenditure, government revenue and government borrowing on unemployment in Nigeria within the period under investigation. The model below is specified to address the objective;

$UMP_t = \delta_0 + \delta_1 GEX_{t-} + \delta_2 GTR_t + \delta_3 TDS + \mu_{3t}$ (3)

Where;

UMP = Unemployment rate

GEX = Government Expenditure

GTR = Government Revenue

TDS = Government Borrowing proxied by Total Debt Stock

MODEL SPECIFICATION FOR OBJECTIVE FOUR

To establish the existence or not of any significant causal link among the dependent and independent variables in Nigeria, the researcher will use Granger causality tests

to establish whether there is feedback or not among the included variables.

Thus, after establishing that the series in the model are stationary and co-integrated, the vector error correction model (VECM) test statistics will be used to test the Null hypothesis.

PRESENTATION OF RESULTS

Tests for stationarity

This study began by the presentation of the results. The result of the Augmented Dickey-Fuller Unit Root test showed that the whole series employed (economic growth (GDP), Inflation (INF), unemployment (UMP), Government expenditure (GEX), government revenue (GTR), and total debt stock(TDS) are non-stationary, ie I(1). This is because their respective ADF test-statistics exceeded the 5% critical value. In other words, the variables are not stationary at their level form and needed to be differenced to determine their respective order of integration. They were all confirmed to be stationary only after their first differencing. The result conducted at both 1% and 5% critical values is presented in table 1 below:

TABLE 1: RESULT OF THE ADF UNIT ROOTS FOR STATIONARITY

	LEVELS			**1st DIFFERENCE**			
VARIABLES	**ADF Statistic**	**1% Critical**	**5% Critical Value**	**ADF Statistic Value**	**1% Critical Value**	**5% Critical Value**	**REMARKS**
GDP	-2.882569	-3.726784	-2.971853	-10.36608	-4.296729	-3.568379	1(1)
INF	-2.8763254	-3.726784	-2.945842	-9.768997	-4.296729	-3.568379	1(1)
UMP	-1.173142	-3.726784	-2.945842	-12.14131	-4.296729	-3.568379	1(1)
GEX	-0.454652	-3.726284	-2.945842	-9.215584	-4.296729	-3.568379	1(1)
GTR	-1.236589	-3.726284	-2.945842	-9.523658	-4.296729	-3.568379	1(1)
TDS	-2.652145	-3.726284	-2.945842	-10.596321	-4.296729	-3.568379	1(1)

Source: Author's compilation using E-View 9.5 computer software

As shown in table 1 above, the unit root tests result indicated that all the series namely; economic growth (GDP); Inflation (INF); unemployment (UMP); government expenditure (GEX); and government tax revenue (TDS); contained unit root and are stationary only after first differencing, at 1% and 5% significant levels. This follows the decision rule which states that when the value of the computed ADF test statistics exceeds its critical value, the null hypothesis is rejected and the alternative accepted.

The stationarities of all the series in the same order was thus a motivation to run for co-integration tests. This is aimed at finding the presence or absence of any long run relationship among the series. This corroborates with the submission by Woodridge (2002) and Grene (1997) that

when more than one variable is not stationary at levels, there is every need to run a co-integration test in order to verify if the series have any long run equilibrium relationship.

In view of the above therefore, since the variables are stationary at difference orders, there was the need for a test for co-integration using the Johansen (1991) co-integration technique. The result is presented in table 2 as shown below:

Table 2: Result of Johansen Co-integration Technique for Equation 1

Date: 04/15/18 Time: 16:28
Sample (adjusted): 1982 2017
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP GEX GTR TDS
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.893885	110.7144	47.85613	0.0000
At most 1 *	0.362313	29.95792	29.79707	0.0479
At most 2	0.283123	13.76127	15.49471	0.0897
At most 3	0.048206	1.778640	3.841466	0.1823

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.893885	80.75651	27.58434	0.0000
At most 1	0.362313	16.19665	21.13162	0.2136
At most 2	0.283123	11.98263	14.26460	0.1113
At most 3	0.048206	1.778640	3.841466	0.1823

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 2: Result of Vector Error Correction Model Analysis for Equation 1

Vector Error Correction Estimates
Date: 04/15/18 Time: 22:13
Sample (adjusted): 1983 2017
Included observations: 35 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
GDP(-1)	1.000000
GEX(-1)	3.852141
	(1.73868)
	[2.21556]
GTR(-1)	-1.636289
	(0.30180)
	[- 5.42176]
TDS(-1)	-4.101592
	(1.70318)
	[-2.40521]
C	6.552437

Error Correction:	D(GDP)	D(GEX)	D(GTR)	D(TDS)
CointEq1	-0.398438	5.42E-05	-0.000113	6.38E-05
	(1.10018)	(0.00010)	(5.0E-05)	(0.00010)
	[-6.62156]	[0.53493]	[-2.24074]	[0.63071]
D(GDP(-1))	0.562215	-0.028027	-0.006084	-0.031600
	(0.42808)	(0.02474)	(0.01233)	(0.02470)
	[1.31333]	[-1.13308]	[-0.49347]	[-1.27926]
D(GDP(-2))	-0.030323	-0.002692	0.022198	-0.001075
	(0.49033)	(0.02833)	(0.01412)	(0.02829)
	[-0.06184]	[-0.09501]	[1.57183]	[-0.03799]
D(GEX(-1))	341.4829	-25.98960	97.09657	-33.98210
	(1326.41)	(76.6430)	(38.2034)	(76.5388)
	[0.25745]	[-0.33910]	[2.54157]	[-0.44399]
D(GEX(-2))	-602.7332	-81.25251	44.39478	-83.64613
	(1593.64)	(92.0841)	(45.9001)	(91.9589)
	[-0.37821]	[-0.88237]	[0.96720]	[-0.90960]
D(GTR(-1))	-1.827336	-0.398249	-0.133879	-0.436041
	(8.76438)	(0.50642)	(0.25243)	(0.50574)
	[-0.20850]	[-0.78639]	[-0.53036]	[-0.86219]
D(GTR(-2))	1.266467	-0.841385	-0.050134	-0.869501
	(6.71946)	(0.38827)	(0.19353)	(0.38774)
	[0.18848]	[-2.16704]	[-0.25905]	[-2.24250]
D(TDS(-1))	-341.8393	26.09688	-97.03033	34.09419
	(1327.28)	(76.6934)	(38.2285)	(76.5891)
	[-0.25755]	[0.34028]	[-2.53817]	[0.44516]
D(TDS(-2))	-602.4649	80.87684	-44.27853	83.27013
	(1593.97)	(92.1030)	(45.9095)	(91.9778)
	[-0.37797]	[0.87811]	[-0.96447]	[0.90533]
C	5.514565	-8.220776	23.09387	-9.985394
	(339.379)	(19.6101)	(9.77480)	(19.5834)
	[0.01625]	[-0.41921]	[2.36259]	[-0.50989]
R-squared	0.511368	0.359063	0.513081	0.368485
Adj. R-squared	0.305400	0.128326	0.337790	0.141139
Sum sq. resids	1591987.	5315.300	1320.644	5300.856
S.E. equation	252.3480	14.58122	7.268133	14.56140
F-statistic	0.356268	1.556155	2.927024	1.620814
Log likelihood	-237.3529	-137.5653	-113.1971	-137.5177
Akaike AIC	14.13445	8.432302	7.039832	8.429581
Schwarz SC	14.57884	8.876687	7.484217	8.873966
Mean dependent	68.86143	0.008571	0.260000	0.008571
S.D. dependent	229.8446	15.61769	8.931511	15.71237

Determinant resid covariance (dof adj.)	48938023
Determinant resid covariance	12738969
Log likelihood	-484.9545
Akaike information criterion	30.22597
Schwarz criterion	32.18126

Source: Author's computations using Eviews 9.5 computer software

As shown is the upper region of the vector error correction model (VECM) for equation 1 above, as well as the normalized cointegrating coefficients for two cointegrating equations given by the long run relationship as shown below: the long run relationship which Normalized cointegrating coefficients (standard error in parentheses)

GDP	GEX	GTR	TDS
1.000000	3.852140	-1.636289	-4.101592
	(1.73867)	(0.30180)	(1.70317)

Real Gross domestic Product as a function of Government Expenditure, Government Revenue and Total Debt Stock shows that co-integrating equation 1 is well behaved having possessed the expected signs, and significant at the VECM results. Also, the value of the error correction coefficient is -0.3984378. This indicates that 39% of the imbalance between the short run and long run relationship is corrected annually. The R-squared value of 0.511368 indicates that about twenty-seven (51%) of the variability in gross domestic product in Nigeria within the period under review was determined or influenced by government expenditure, government revenue and total debt stock. At five percent (5%) level of significance and relevant degrees of freedom, government expenditure (GEX), government revenue (GTR) and total debt stock (TDS) as shown by their computed t-values of 2.21556, -5.42176, and -2.40521 respectively, appeared to be highly significant determinants of gross domestic products in Nigeria within the sampled stage.

As regards the expected signs, the link between gross domestic product and Government expenditure is positive, while government tax revenue (GTR) and total debt stock (TDS) are negatively related with gross domestic product in the long run as can be seen in the upper region of the vector error correction model (VECM). On the other hand, the relationship between gross domestic product and total debt stock is negative in the short run. However, in the short run the connection involving gross domestic product and government expenditure remained positive as it was in the long run as shown in the table 2 above.

As regards the short run effects of these macroeconomic aggregates as shown in the lower region of the vector error correction model (VECM), the three fiscal policy tools, government expenditure, government revenue and total debt stock are shown to be significant in explaining changes in gross domestic products in Nigeria.

Granger causality tests were also conducted to find out which variable causes the other.

Table 3: Granger causality tests result FOR GEX, GTR, TDS ON GDP

Pairwise Granger Causality Tests
Date: 04/15/18 Time: 18:10
Sample: 1980 2017
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GEX does not Granger Cause GDP	36	1.13951	0.0094
GDP does not Granger Cause GEX		1.37598	0.2676
TDS does not Granger Cause GDP	36	0.06066	0.9413
GDP does not Granger Cause TDS		3.03758	0.0527
GTR does not Granger Cause GDP	36	1.48135	0.2430
GDP does not Granger Cause GTR		3.08270	0.0411
TDS does not Granger Cause GEX	36	0.30819	0.7370
GEX does not Granger Cause TDS		0.28600	0.7532
GTR does not Granger Cause GEX	36	1.23634	0.3044
GEX does not Granger Cause GTR		0.38584	0.6831
GTR does not Granger Cause TDS	36	1.17826	0.3212
TDS does not Granger Cause GTR		0.41439	0.6643

As also indicated by the Granger causality test, unilateral causation exists between gross domestic product and government expenditure, government revenue and total debt stock as shown above:

This is because the F-value of 1.13951, 3.03758, 3.08271 with their corresponding low P-values of 0.0094, 0.0527 and 0.0411are significant for null hypotheses.

Next equation in the model is **equation 2** which relates inflation as a function of government expenditure, government tax revenue and total debt stock. The outcome of the co- integration tests revealed in Table 4.4 underneath confirms the existence of (2) co integrating relationships for trace statistic or likelihood ratio and (1) cointegrating relationships for maximum eigenvalue statistic.

Table 4: Result of Johansen Co-integration Technique for equation 2

Date: 04/15/18 Time: 16:31
Sample (adjusted): 1982 2017
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: INF GEX GTR TDS
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.861804	99.53141	47.85613	0.0000
At most 1*	0.379102	28.28447	27.79707	0.0439
At most 2	0.252121	11.12731	15.49471	0.2038
At most 3	0.018406	0.668803	3.841466	0.4135

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.861804	71.24694	27.58434	0.0000
At most 1	0.379102	17.15716	21.13162	0.1647
At most 2	0.252121	10.45851	14.26460	0.1835
At most 3	0.018406	0.668803	3.841466	0.4135

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As shown above, the null hypothesis of no co- integration amongst the variables is discarded in at least two equations from trace statistics and 1 from maximum eigenvalue tests. The test results show the presence of long run equilibrium connection in three co- integrating equations at five percent (5%) level of significance.

To determine the long run impact of inflation (INF) on government expenditure (GEX), Government Revenue (GTR) and Total Debt stock (TDS), Vector error correction model (VECM) which incorporates both the long run and short run effects simultaneously was estimated. Below is the result of the VECM on the impact of fiscal policy tools on inflation.

Table 5: VECTOR ERROR CORRECTION MODEL (VECM) RESULT FOR GEX, GTR TDS ON INF

Vector Error Correction Estimates
Date: 04/15/18 Time: 22:27
Sample (adjusted): 1983 2017
Included observations: 35 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
INF(-1)	1.000000
GEX(-1)	-0.006049
	(0.01702)
	[-3.55423]
GTR(-1)	-0.785780
	(0.56201)
	[-1.39815]
TDS(-1)	-0.087400
	(0.03603)
	[-2.42572]
C	5.811020

Error Correction:	D(INF)	D(GEX)	D(GTR)	D(TDS)
CointEq1	-0.287205	-0.324278	-0.107964	-0.298395
	(1.05332)	(0.22752)	(0.13206)	(0.23045)
	[-2.72666]	[-1.42530]	[-0.81757]	[-1.29485]
D(INF(-1))	-0.314900	-0.515380	0.079022	-0.531189
	(0.18988)	(0.81017)	(0.47024)	(0.82061)
	[-1.65843]	[-0.63614]	[0.16804]	[-0.64731]
D(INF(-2))	-0.221623	-0.437615	-0.076343	-0.441460
	(0.17862)	(0.76215)	(0.44237)	(0.77197)
	[-1.24074]	[-0.57419]	[-0.17258]	[-0.57186]
D(GEX(-1))	-1.744174	103.5939	37.63319	93.11540
	(16.6025)	(70.8396)	(41.1169)	(71.7523)
	[-0.10506]	[1.46237]	[0.91527]	[1.29773]
D(GEX(-2))	-3.278321	88.67307	17.34822	92.02811
	(16.4250)	(70.0822)	(40.6773)	(70.9851)
	[-0.19959]	[1.26527]	[0.42648]	[1.29644]
D(GTR(-1))	-0.115796	-0.104806	-0.547257	-0.120543
	(0.07391)	(0.31536)	(0.18304)	(0.31942)
	[-1.56671]	[-0.33234]	[-2.98978]	[-0.37738]
D(GTR(-2))	-0.147580	-0.546718	-0.280744	-0.563932
	(0.07019)	(0.29950)	(0.17384)	(0.30336)
	[-2.10248]	[-1.82542]	[-1.61498]	[-1.85895]
D(TDS(-1))	-1.737468	-103.5011	-37.50543	-93.02874
	(16.5959)	(70.8116)	(41.1006)	(71.7239)
	[-0.10469]	[-1.46164]	[-0.91253]	[-1.29704]
D(TDS(-2))	-3.250287	-88.97233	-17.20939	-92.33915
	(16.4108)	(70.0218)	(40.6422)	(70.9239)
	[-0.19806]	[-1.27064]	[-0.42344]	[-1.30195]
C	0.057028	28.31566	9.713766	26.20959
	(4.50407)	(19.2180)	(11.1546)	(19.4656)
	[0.01266]	[1.47339]	[0.87083]	[1.34646]
R-squared	0.271594	0.412189	0.394507	0.404191
Adj. R-squared	0.259368	0.200577	0.176530	0.189700
Sum sq. resids	267.7588	4874.724	1642.243	5001.138
S.E. equation	3.272667	13.96384	8.104921	14.14374
F-statistic	1.035723	1.947855	1.809856	1.884421
Log likelihood	-85.27077	-136.0511	-117.0111	-136.4991
Akaike AIC	5.444044	8.345776	7.257776	8.371378
Schwarz SC	5.888429	8.790161	7.702161	8.815763
Mean dependent	0.388571	0.008571	0.260000	0.008571
S.D. dependent	3.288104	15.61769	8.931511	15.71237

Determinant resid covariance (dof adj.)	41541.00
Determinant resid covariance	10813.46
Log likelihood	-361.2010
Akaike information criterion	23.15434
Schwarz criterion	25.10964

This is also supported with the result of the normalized cointegrating coefficients (standard error in parentheses) as shown below:

Normalized cointegrating coefficients (standard error in parentheses)

Inflation	GEX	GTR	TDS
1.000000	-0.060493	-0.785780	-0.087399
	(0.01702)	(0.56201)	(0.03603)

The result of the VECM indicates that the co-integrating equation 1 possesses the expected negative sign. The value of VECM is -0.2872053. This shows that about 28% of the short run errors of the economy are corrected each year. The R-Squared value of 0.271594 indicates that about twenty seven (27%) of the variability in inflation in Nigeria within the period was influenced by fiscal policy tools. At five percent (5%) level of significance and relevant degrees of freedom, government expenditure, government revenue and total debt stock as shown by their computed t-values of -3.55423, -1.39815, -2.42572 respectively, appeared to be statistically significant determinants of inflation in Nigeria within the sampled period.

In terms of the expected signs, the relationship between inflation and fiscal policy tools is positive. In other words, there is a long run positive link among inflation and government expenditure, government revenue and total debt stock in Nigeria within the period under study.

As regards the short run effects as shown by the lower region of the VECM results, all the variables appeared with the same signs as in the long run relationship

In addition, the result of the Granger causality tests supported this finding as the result confirmed a unidirectional causality between inflation and government expenditure, government revenue and total debt stock as shown in table below.

Table 6: GRANGER CAUSALITY TESTS RESULT FOR INF ON FISCAL POLICY TOOLS

Pairwise Granger Causality Tests
Date: 04/15/18 Time: 19:09
Sample: 1980 2017
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GEX does not Granger Cause INF	36	0.52637	0.5059
INF does not Granger Cause GEX		5.86521	0.0218
GTR does not Granger Cause INF	36	0.48486	0.6204
INF does not Granger Cause GTR		4.20291	0.0382
TDS does not Granger Cause INF	36	0.05059	0.9507
INF does not Granger Cause TDS		3.72558	0.0195
GTR does not Granger Cause GEX	36	1.23634	0.3044
GEX does not Granger Cause GTR		0.38584	0.6831
TDS does not Granger Cause GEX	36	0.30819	0.7370
GEX does not Granger Cause TDS		0.28600	0.7532
TDS does not Granger Cause GTR	36	0.41439	0.6643
GTR does not Granger Cause TDS		1.17826	0.3212

With the F-value of 5.86521, 4.20291 and 3.72558 and their low P-value of 0.0218, 0.0382 and 0.0195 for GEX, GTR and TDS respectively, the null hypothesis that changes in inflation does not cause changes in fiscal policy tools is rejected. The researcher thus concluded that changes in inflation granger causes changes in government expenditure, government revenue and total debt stock in Nigeria within the period under review.

Another equation in the model is **equation 3** which relates unemployment as a function of the government expenditure, government revenue and the total debt stock.

From the result below, it was shown that the co-integration tests shown in Table 4.7 confirm the existence of (2) co integrating relationships on trace statistic and one maximum eigen statistic. The null hypothesis of no co-integration among the variables is rejected in at least 2 equations from trace statistic and 1 from maximum eigenvalue tests.

Table 7: Result of Johansen Co-integration Technique for equation 2

Date: 04/15/18 Time: 16:34
Sample (adjusted): 1982 2017
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend
Series: UMP GEX GTR TDS
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.850128	101.3421	47.85613	0.0000
At most 1 *	0.404795	33.01504	29.79707	0.0206
At most 2	0.327557	14.33648	15.49471	0.0742
At most 3	0.001397	0.050318	3.841466	0.8225

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.850128	68.32704	27.58434	0.0000
At most 1	0.404795	18.67855	21.13162	0.1065
At most 2 *	0.327557	14.28617	14.26460	0.0496
At most 3	0.001397	0.050318	3.841466	0.8225

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

To determine the long run impact of Unemployment (UMP) on Government Expenditure (GEX), Government Revenue (GTR) and Total Debt stock (TDS), Vector error correction model (VECM), which incorporates both the long run and short run effects simultaneously, was estimated. Below is the result of the VECM on the impact of fiscal policy tools on unemployment.

Table 8: Vector Error Correction Model (VECM) Result for GEX, GTR TDS ON UM

Vector Error Correction Estimates
Date: 04/15/18 Time: 15:41
Sample (adjusted): 1983 2017
Included observations: 35 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
UMP(-1)	1.000000
GEX(-1)	-0.171143 (0.05996) [-2.85428]
GTR(-1)	0.577671 (0.54511) [1.05973]
TDS(-1)	-0.019967 (0.00468) [-4.26645]
C	5.838941

Error Correction:	D(UMP)	D(GEX)	D(GTR)	D(TDS)
CointEq1	-0.331629 (0.15162) [-2.18723]	-0.330204 (0.23535) [-1.40301]	-0.074689 (0.13007) [-0.57424]	-0.302092 (0.23810) [-1.26876]
D(UMP(-1))	-0.244565 (0.19196) [-1.27405]	0.279921 (0.87523) [0.31982]	0.646773 (0.48369) [1.33717]	0.310286 (0.88544) [0.35043]
D(UMP(-2))	-0.020590 (0.19859) [-0.10368]	0.805159 (0.90545) [0.88923]	-0.163626 (0.50039) [-0.32700]	0.798886 (0.91601) [0.87213]
D(GEX(-1))	11.07462 (16.0384) [0.69051]	104.1858 (73.1268) [1.42473]	27.70413 (40.4127) [0.68553]	93.11830 (73.9798) [1.25870]
D(GEX(-2))	8.193358 (15.6121) [0.52481]	91.68656 (71.1835) [1.28803]	4.227717 (39.3387) [0.10747]	94.24174 (72.0138) [1.30866]
D(GTR(-1))	-0.029905 (0.07371) [-0.40572]	-0.194235 (0.33607) [-0.57795]	-0.503264 (0.18573) [-2.70969]	-0.205821 (0.33999) [-0.60537]
D(GTR(-2))	0.002800 (0.06823) [0.04105]	-0.572725 (0.31107) [-1.84113]	-0.257522 (0.17191) [-1.49800]	-0.588341 (0.31470) [-1.86952]
D(TDS(-1))	-11.05905 (16.0266) [-0.69004]	-104.0453 (73.0732) [-1.42385]	-27.55797 (40.3830) [-0.68241]	-92.98676 (73.9255) [-1.25784]
D(TDS(-2))	-8.229188 (15.5928) [-0.52776]	-91.93345 (71.0953) [-1.29310]	-4.102429 (39.2900) [-0.10441]	-94.50466 (71.9246) [-1.31394]
C	3.647464 (4.36582) [0.83546]	27.56045 (19.9059) [1.38454]	6.533990 (11.0008) [0.59396]	25.25524 (20.1381) [1.25410]
R-squared	0.492137	0.387231	0.427780	0.380387
Adj. R-squared	0.037693	0.166634	0.221781	0.157326
Sum sq. resids	244.4421	5081.705	1551.999	5200.950
S.E. equation	3.126929	14.25722	7.879085	14.42352
F-statistic	0.660651	1.755376	2.076613	1.705306
Log likelihood	-83.67638	-136.7788	-116.0220	-137.1847
Akaike AIC	5.352936	8.387360	7.201257	8.410554
Schwarz SC	5.797321	8.831745	7.645642	8.854939
Mean dependent	0.594286	0.008571	0.260000	0.008571
S.D. dependent	2.983183	15.61769	8.931511	15.71237

Determinant resid covariance (dof adj.)	36251.82
Determinant resid covariance	9436.645
Log likelihood	-358.8176
Akaike information criterion	23.01815
Schwarz criterion	24.97344

This is also supported with the result of the normalized cointegrating coefficients (standard error in parentheses) as shown below:

Normalized cointegrating coefficients (standard error in parentheses)

Unemployment	GEX	GTR	TDS
1.000000	-0.171143	0.577671	-0.019967
	(0.05996)	(0.545511)	(0.00468)

The result of the VECM indicates that the co-integrating equation 1 possesses the expected sign. The value of VECM is -0.331629. This shows that about 33% of the short run errors of the economy are corrected each year. The R-Squared value of 0.492137 indicates that about forty nine (49%) of the variability in unemployment in Nigeria within the period was influenced by fiscal policy tools. At five percent (5%) level of significance and relevant degrees of freedom, government expenditure, government revenue and total debt stock as shown by their computed t-values of -2.85428, 1.05973, -4.26645 respectively, appeared to be statistically significant determinants of unemployment in Nigeria within the sampled period.

In terms of the expected signs, the relationship between unemployment and fiscal policy tools is negative. In other words, there is a long run negative link among unemployment and government expenditure and total debt stock in Nigeria within the period under study.

In addition, the result of the Granger causality tests supported this finding as the result confirmed a unidirectional causality between unemployment and government expenditure, government revenue and total debt stock as shown in table below.

TABLE 9: GRANGER CAUSALITY TESTS RESULT FOR UMP ON FISCAL POLICY TOOL

Pairwise Granger Causality Tests
Date: 04/15/18 Time: 22:00
Sample: 1980 2017
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GEX does not Granger Cause UMP	36	1.03673	0.3666
UMP does not Granger Cause GEX		3.69477	0.0420
GTR does not Granger Cause UMP	36	0.17666	0.8389
UMP does not Granger Cause GTR		3.03139	0.0533
TDS does not Granger Cause UMP	36	1.07574	0.3534
UMP does not Granger Cause TDS		3.55246	0.0323
GTR does not Granger Cause GEX	36	1.23634	0.3044
GEX does not Granger Cause GTR		0.38584	0.6831
TDS does not Granger Cause GEX	36	0.30819	0.7370
GEX does not Granger Cause TDS		0.28600	0.7532
TDS does not Granger Cause GTR	36	0.41439	0.6643
GTR does not Granger Cause TDS		1.17826	0.3212

This is because with their F-value of 3.69477, 3.03139 and 3.55246 and their low P-value of 0.0420, 0.0533 and 0.0323 for GEX, GTR and TDS respectively, the null hypothesis that changes in unemployment does not cause changes in fiscal policy tools is rejected. The researcher thus concluded that changes in unemployment granger causes changes in government expenditure, government revenue and total debt stock in Nigeria within the period under review.

CONCLUSION AND RECOMMENDATION

This paper examined the impact of fiscal policy tools and performance of macroeconomic variables in Nigeria. Econometric techniques were applied in other to determine this relationship. The literature shows different arguments have

been put forward on the impact of fiscal policy tools on macroeconomic variables. Some believe that the relationship between GDP and government expenditure is positive while others argued that it is negative. This study employs the co-integration and vector error correction model to analyze the relationship between fiscal policy tools (government expenditure, government revenue and total debt stock) and macroeconomic aggregate (GDP, Inflation and Unemployment) in Nigeria using various analytical tools, including unit root tests, cointegration tests and granger causality tests analysis.

Based on the econometric analysis used in this study, we found a statistically positive long run relationship between government expenditure and GDP while a negative relationship exist between total debt stock (government borrowing) and GDP. Also a positive relationship exists between fiscal policy tools (government expenditure, government tax revenue and government debt stock) used in the model and inflation rate in Nigeria. This indicates that an increase in government expenditure, government tax revenue as well as government debt stock lead to price rise (inflation). This is evidenced in the coefficient of determination of the model (R^2) which is obviously high.

The paper recommends that; expansionary fiscal policy should be encouraged as it plays vital roles in the development process of an economy. Also, there should be appropriate policy mix improvement in quality of government expenditure. This will enable Nigeria government to increase her capital expenditure especially in the area of infrastructural development, such as power supply, so that the citizenry can utilize such to boost the production and hence increase employment opportunities in Nigeria.

There is the need for massive capital expenditure in productive ventures in Nigeria, especially on agriculture. Nigeria is still agrarian economy as at the moment. Efforts should be focused on establishing integrated agriculture in virtually the entire local government in the country. This requires the federal government collaboration with state, local and multinational agencies. This will quickly create employment as articulated by Keynes so as to tackle unemployment, promote economic growth and poverty reduction.

It is also needful to diversify the economy by developing other sectors such as solid mineral, agriculture and manufacturing so as to reduce excessive importation and have more goods available in order to counteract inflation at all time.

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