Fiscal Policy and Non-Oil Output in Nigeria

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***Abstract*: - The study examined fiscal policy and non-oil output in Nigeria from 1970-2017. Secondary data on government capital and recurrent expenditure for the study was collected from CBN statistical bulletin and the econometrics methods of ADF unit root test, Johansen co-integrated test and ECM technique were used for the analysis. The results of the output model showed that all the variables were stationarity at order one and have long run relationship. The parsimonious ECM result showed that a percentage increase government capital expenditure increases the non-oil sector output sector by about 29%.The coefficient of government recurrent expenditure showed that a percentage increase government recurrent expenditure will increase the non-oil sector output sector by about 2.0%. Given the scenario above, it was concluded that there is a direct relationship between government expenditure and non-oil output in Nigeria during the period of study. Based on these findings, it was recommended that the percentage of government capital budget should be more than recurrent as former play more vital role in the development of the non-oil output in Nigeria.**

Key Words: **Government Expenditure, Non-oil output, Capital budget, Recurrent**

I. INTRODUCTION

The non-oil sector of the Nigerian economy embraces the groups of economic activities, without the petroleum and gas industry and those rightly connected to it. The sector largely includes subsectors such as manufacturing, agriculture, transport and communication, finance, tourism, real estate, construction as well as education and health. However, in terms of supporting the economy, the non-oil sector has continued to perform below its potentials. There is therefore, the urgent need to specifically use fiscal policy tools such as government expenditure to launch the non-oil sector on the pathway of sustained production and stable economic growth. Thus, government expenditure entails financial matters in which government income and consumption are utilized as a change of either to accomplish the desirable impact and maintain a strategic distance from the undesirable ones (Obayori, 2016).

Meanwhile, the application of fiscal policy instruments, particularly government expenditure for re-engineering the performance of the non-oil sector becomes necessary for important reasons. First, the cyclical nature of the international oil market with the attendant volatility of government revenue gives credence to any argument for deliberate diversification to rely more on non-oil economy. Secondly, the facts that crude oil is an exhaustible asset and its facilities are often vandalized make it unreliable for sustainable development of the Nigerian economy (Utomi, 2004; Riti, Gubak & Madina, 2016). The undesirable effects of over reliance on crude oil and gas economy amplified the concern for diversification of the Nigerian economy. Reacting to the situation, Nigerian governments have over the years made efforts to grow the non-oil sector of the economy via supportive policies and incentives to encourage diversification of the economy. These policies may be grouped into three periods, namely: The protectionism policy in the light of import substitution policy of industrialization (Pre-SAP Era, 1960 to 1986); the trade liberalization policy (Structural Adjustment Programme Era) of the 1986 and the export promotion policy (Post SAP Era) of 1999 which was executed through intensified policy support to Small and Medium Scale Enterprises (SMEs) to enhance productivity and subsequently, export of local products (Ogunjimi, Aderinto & Ogunro, 2015). Despite these policies and incentives, evidence indicates that the non-oil sector output has not been impressive in terms of contribution to revenue generation and foreign exchange earnings since 1970. For instance, the Nigeria's non-oil sector recorded an average growth rate of 15.12 per cent as against 28.23 per cent of the oil sector in the pre SAP era from 1971-1985.

Meanwhile, after the introduction of SAP policy in 1986, the non-oil sector reported an average growth rate of 3.28 per cent which was slightly higher than the 3.15 per cent growth of the oil counterpart. With the return to democracy from 1999-2015, the non-oil sector growth rate improved to 8.74 per cent. Also, the non-oil sector accounted for an average percentage contribution of 75.92 per cent to GDP, which more than tripled the 24.08 per cent contribution of the oil sector during period 1971-1985. The non-oil sector's average share of GDP were 62.94 per cent and 79.70 per cent while the oil sector's average contributions were 37.06 per cent and 20.30 per cent during the SAP era and the era of sustained civil rule from 1999-2015 respectively (CBN Statistical Bulletin, 2015).Thus, given the fact that fiscal policy serve to achieve the main economic objectives of job creation, output growth, and sustainable development (Bakare-Aremu & Osobase, 2015) of which non-oil sector viability is inclusive, this study is proposed to examine the relative effects of fiscal policy on the non-oil sector output of the Nigerian economy.

Given the background above, the specific objectives of the study were to: examine the effect ofgovernment capital expenditure on non-oil output in Nigeria from 1970 to 2017; and determine the effect of government recurrent expenditure on non-oil output in Nigeria from 1970 to 2017. For the purpose of this study, the work is carefully organized into introduction, literature review, methodology, results and discussion as well as the concluding remarks.

II. LITERATURE REVIEW

2.1 Keynesian Fiscal Policy Theory

The study is anchored on Keynesian fiscal policy theory. The theory posits that fiscal policy (FP) principally influences income and output growth. The analysis of the Keynesian theory concentrates on the issue of monetary liquidity trap, but inference that money supply is only indirectly significant for growth determination through the instrumentality of interest rate (Keynes, 1936). The important implication of the liquidity trap is that when the rate of interest falls to the level at which liquidity trap occurs, additional supply of money will not reduce interest rate any further to boost private investment (Onuchuku & Adoghor, 2000). Therefore, if the level of private investment that should occur at the minimum rate of interest is still not enough to provide expenditure equal to full employment output.

However, the Keynesians prescribed that in a liquidity trap situation, an expansionary fiscal policy is suitable for re-engineering investment and output. In fact, as long as we remain in liquidity trap, only employment of quantitative fiscal easing will generate full productive effect on economic activities as predicted by the government spending multiplier because interest rates do not rise at all and there is no crowding out of private investment to offset the effects of the increase in government expenditure (Anyanwu, 1993; Ahuja, 2013). Hence, the Keynesians support for the efficacy of fiscal actions for boosting non-oil (economic) activities.

2.2 Empirical Literature

There are mixed results about the effects of fiscal policy instruments on aggregate output variables. For instance, Akidi, Agiobenebo and Ohale (2018) examined the effect of fiscal policy on non-oil output in Nigeria from 1980 to 2016. The unit root test results showed that all variables were individually integrated of order and jointly exhibited cointegrating relationships. The ECM model analysis revealed that the utilized measures of fiscal policy directly and significantly influenced non-oil output over the sampled period, except domestic and external borrowings, which were also significant but inversely related with the regressand.

Utpal and Dahun(2018)used ARDL to examine the relationship between government expenditure in agriculture and its allied sector and agricultural output of Meghalaya from 1984 to 2014. The result of the Bounds test indicates the presence of a long-run co integrating relationship between the variables in the study. The results reveal that in the long run, the effect of public expenditure through agriculture and allied activities, on agricultural output is significantly negative, while expenditures on education and transport on agricultural output are significantly positive that is in line with several earlier studies. Public expenditure in healthcare however does not significantly affect agricultural output. Also, Idoko and Jatto (2018) examined the relationship between government expenditure on agriculture and economic growth in Nigeria from 1985- 2015. The study used multiple regression analysis and Johansen co-integration test. The multiple regression results of the study revealed that there exists a positive and significant relationship between government expenditure on agriculture and economic growth in Nigeria.

Aina and Omojola (2017) used ECM to examine the effect of government expenditure on agricultural sector performance in Nigeria between 1980 and 201. The short run analysis showed that there is a significant and positive relationship between government expenditure on agriculture and agricultural production output. The long run dynamic result shows that the coefficient of government expenditure on agriculture variable is rightly signed as well as the check variables (interest and exchange rates). There exists a long run relationship among the variables because the coefficient of ECM is rightly signed i.e. negative and significant.

Obi and Obayori (2016) examined the dynamic effect of government spending on agricultural output in Nigeria from 1980-2015 with the use of co-integration/ error correction mechanism and granger causality test methods. The authors discovered that government capital and recurrent spending on agriculture were positively related to agricultural output. Also, a unidirectional relationship occurs between both government capital and recurrent spending and agricultural output.

Ubesie (2016) employed Ordinary Least Square (OLS) multiple regression analysis method to study the effect of fiscal policy on economic growth in Nigeria from 1985 to 2015. The results suggested that total government expenditures were significant to government revenue within the period covered in the study. However, investment expenditures were much lower than recurrent expenditures evidencing the poor growth in the country's economy.Similarly, Maku (2015) examined the impact of fiscal policy on economic growth of the Nigerian economy from 1970 to 2011 by adopting Ordinary Least Square. The results showed that fiscal policy significantly stimulated economic growth within the captured period, which signals that suitable fiscal measures such as the expansionary policy actions would drive economic growth in the country.

III. METHODOLOGY

The employed time series data which consist of non-oil gross domestic product to measure non-oil sector output in Nigeria as well as government capital and recurrent expenditure to measure fiscal policy. All data which covered between 1970 and 2017 were sourced from CBN statistical bulletin. The paper employs the econometrics method of parsimonious ECM. In doing this, it was assumed that government capital and recurrent expenditure were positively related and impacted significantly on non-oil output as stated in the apriori. This implies that a higher growth level of government expenditure will resulted into an increase in the output of the non-oil sector. Also, theoretically, the coefficient of the error correction term is expected to be negatively signed and have a value between zero and one as it indicates the speed of

adjustment from the short-run equilibrium to the long-run equilibrium state.

Model Specification

The model for the study was stated thus;

$NGDP = \alpha_0 + \alpha_1 NGDP_{t-1} + \alpha_2 GCEX_t + \alpha_3 GREX_t + \varepsilon ECM_{t-} + \mu_t$ (1.1)

Where; $NGDP_t$ = Non-oil Gross Domestic Product, $GCEX_t$ = Government Capital Expenditure, $GREX_t$ = Government Recurrent Expenditure α_0 = Constant term, α_1, α_2, are Regression Coefficient of independent variable, ε is the coefficient of ECM and U is the error term and μt = Stochastic Error Term.

On the apriori, we expect $\alpha_1 > 0$, $\alpha_2 > 0$ and $\alpha_3 > 0$

IV. RESULTS AND DISCUSSION

This section presents and analyzes the data. This was done under, descriptive statistics, unit root test, co-integration test and ECM method.

Table 1: Descriptive Statistics for Underlying Series

Instruments'	NGDP	GCX	GRX
Mean	23549	302.0	32425
Std. Dev.	17188	377.0	76420
Skewness	1.115059	0.9238	3.8444
Jarque-Bera	9.9584	7.7055	693.1705
Probability	0.0069	0.0212	0.0000

Source: *Authors' Computation from (E- view 9)*

The descriptive statistics reported in Table 1showed that on the average Non-oil output (NGDP), Government capital expenditure (GCX) and Government recurrent expenditure (GRX) are ₦23549billion, ₦302billion and ₦32425billion respectively. Meanwhile, the standard deviations of the variables were not within their respective mean. Thus, the need for stationarity tests in order to achieve normal distribution of the time series. The skewness test result showed positive values for all the variables. Thus, it is concludes that they all the variables have high tails. The probability of Jarque-Bera statistics which is less than 0.05, suggested that the alternative hypothesis of normal distribution for all the variables was accepted.

Table 2 Augmented Dickey Fuller Unit Root Test at First Difference

Variables	**ADF @ Level**	**5% Critical Value**	**Decision**	**ADF @ 1st Diff**	**5% Critical Value**	**Decision**
NGDP	-1.0781	-2.925	Not stationary	-3.3657	-2.9281	Stationary1(I)
GCX	-0.4263	-2.9251	Not stationary	-8.9225	-2.9266	Stationary1(I)
GRX	-3.0652	-3.5085	Not stationary	-10.2557	-3.5107	Stationary1(I)

Source: *Authors' Computation from (E- view 9)*

The unit root test of stationarity of each of the series via the ADF test as presented in Table 2 showed that the three variables were not stationary at level at 5% critical value. Therefore, they were differenced once and they became stationary at first difference prior to further estimations to prevent untrue regressions results and achieve the best regression results when these variables were used in the model estimations.

Table 3 Johansen Co-integration Test Result

Eigen value K=3, r=3	**Trace Statistics**	**5% critical value**	**Prob. ****	**Hypothesis of CE(s)**
0.6949	95.1906	47.8561	0.0000	None *
0.41915	42.9562	29.7971	0.0009	At most 1 *
0.3395	19.0527	15.4947	0.0139	At most 2 *

*Note: r=number of co-integrating vectors and k = number of lags in model. * rejection of the H0*

Source: *Authors' Computation from (E- view 9)*

The results of the Trace statistics above revealed the existence of three co-integrating equations in the model. This is because the computed values of the Trace test statistics are greater than their corresponding critical values at 5% level. Thus, the null hypothesis (H0) of no co-integration among the variables was rejected. Based on these findings, it is concluded that the variables have long run relationship. Therefore, the estimation of error correction model.

Table 4 Parsimonious Error Correction Mechanism Result

Variable	**Coefficient**	**t-Statistic**	**Prob.**
C	0.0053	0.1617	0.8724
DLOG(NGDP(-1))	0.0952	0.6915	0.4935
DLOG(NGDP(-2))	0.0767	0.5756	0.5683
DLOG(GCX)	0.2877	3.3782	0.0017
DLOG(GRX)	0.0162	0.6018	0.5509

ECM(-1)	-0.0110	-2.2326	0.0058
R-squared	0.6833	Mean dependenvar	0.060712
Adjusted R-squared	0.5860	S.D.dependentvar	0.223062
F-statistic	2.3969	Durbin Watson Stat	1.871619
Prob(F-statistic)	0.0030		

Source: *Authors' Computation from (E- view 9)*

The results of the parsimonious error correction model presented in Table 4showedthat the lag one value of NGDP is positively signed but not significant with NGDP. The coefficient of ECM has the right negative sign and statistically significant at 5% level. Therefore, the long run equilibrium position was achieved in the case of the short run disequilibrium in the system. Equally, the speed of adjustment in the long run as denoted by the coefficient of ECM showed that about 10% of the disturbance in the short run is corrected each year. Also, the R-squared (R^2) of 68% showed that the model is a good fit. The Durbin Watson statistics value of 1.87 which is not too far from 2.0 bench mark of DW acceptable value, suggested that the model is free from positive first order correlation. Thus, the explanatory variables in the model are not serially correlated. Also, the f-statistic value of 2.3969 with probability value of 0.0030 which is less than 0.05 critical values showed that all the explanatory variables are significant in explaining the growth of non-oil output in Nigeria during the period of study.

In the meantime, the coefficient of government capital expenditure is positively signed and statistically significant with non-oil sector output at 5 percent level. Meaning that a percentage increase government capital expenditure will increase the non-oil sector output sector by about 29%. Also, the of government capital expenditure which is prob(0.0017) is less that 0.05 critical value. This showed that the alternative hypothesis of significant relationship between government capital expenditure and non-oil output was accepted. The findings is in line with empirical works of Eze and Ogiji (2013) as well as Akidi, Agiobenebo & Ohale (2018) who revealed that government capital expenditure is directly and significantly related with the non-oil output.

The coefficient of government recurrent expenditure is positively signed but statistically not significant with non-oil sector output at 5 percent level. Meaning that a percentage increase government recurrent expenditure will increase the non-oil sector output sector by 2%. Also, the prob value of recurrent expenditure (0.5509) which is greater than 0.05 critical value, showed that the null hypothesis of no significant relationship was accepted. The findings corroborated the empirical work of Ghazi and Martha (2010) who revealed that increases in government recurrent spending positively influenced non-oil GDP growth rate in the long-run.

Table 5: Post Estimation Test Results

Test	Test Statistic	Prob. Value	Critical Prob
Wald Test	F-stat (104.8)	0.0000	0.05
Serial Auto Correlation Test	Obs R^2 (2.9183)	0.2324	0.05
Heteroskedasticity Test	Obs R^2 Stat (0.4326)	0.9986	0.05

Source: *Authors' Computed Result from (E-views 9.0)*

The post estimation test which focuses mainly on Wald test, serial auto correlation test and heteroskedasticity test was presented on Table 5. The Wald test result with F-statistic (104.8) showed that the probability value is 0.0000. Since the probability is less than 0.05 critical values, therefore all the independent variables in the estimated model are jointly significant in explaining non-oil output in Nigeria over the study period. Similarly, the estimated model is equally free from serial autocorrelation and heteroskedasticity problem given that their respective p-value of 0.2324 and 0.9986 of observed R-squared statistic is greater than 0.05 critical values. From the analysis above, the result of the post estimation tests are okay as they meet the statistical criteria and authenticate the reliability of the estimated model for policy formulation and recommendation.

V. CONCLUDING REMARKS

The study examined the effect of fiscal policy non-oil output in Nigeria in during the period of 1970-2017. The empirical results showed that all the time series were stationary at order one. Also, the dynamic model depicted by the co-integration result showed that there is a long run equilibrium relationship among the variables. Similarly, the parsimonious error correction result showed that the coefficient of ECM has the hypothesized negative sign and statistically significant at 5% level. Moreover, government capital expenditure is positively signed and statistically significant with non-oil sector output. Also, government recurrent expenditure is positively signed but statistically not significant with non-oil sector output at 5 percent level. The post estimation tests results meet the statistical criteria and authenticate the reliability of the estimated model for policy formulation and recommendation.

From the discussion so far, it is obvious that fiscal policy measures if well manage are effective in achieving non-oil output in Nigeria. The study therefore concluded that the success of fiscal policy in promoting favourable growth depends to a large extent on a well-articulated government expenditure. Based on the findings, the paper recommended amongst others that expansionary policies on fiscal policy measures especially in government capital and recurrent spending should be encouraged as they play vital role in the growth of the non-oil output in order to improve economic growth in Nigeria.

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