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OIL REVENUE AND GOVERNMENT EXPENDITURE IN NIGERIA

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Abstract: This study examined oil revenue and government expenditure in Nigeria. Specifically, it investigated the impact of oil revenue on government expenditure in the country over the period 1999 to 2019. The technique of generalized method of moment (GMM) was employed to analyze secondary data collected from Central Bank of Nigeria statistical bulletin. The result of the Augmented Dickey Fuller unit root test showed that both the dependent and the independent variables were stationary at first difference. The empirical findings from the GMM revealed that percentage increase in oil revenue causes total government expenditure to increase. The foregoing finding bears an important implication for policy formulation, given the direct relationship between oil revenue and government expenditure. Thus, government needs to re-examine the shares of both capital and recurrent expenditure in total government spending coming from oil revenue. Therefore, given the huge revenue from oil, government should boost spending on developmental projects.

Keywords: Capital expenditure, Recurrent expenditure, Government, Oil, Revenue

1. INTRODUCTION

Government expenditure as a component of aggregate demand, include all spending at each level of government to meet the goal of stable and long-run growth, economic efficiency, and poverty alleviation. (Gbanardo, 2007).Hence, the size of government expenditure reveals the magnitude of government involvement in the economy. The shift in the role of government from traditional functions such as provision of security, administration and law and order to direct intervention in income generating activities like capital investment and distributive role like subsidies and transfers have significantly expanded the scope of governments in many countries across the globe.

Meanwhile, crude oil is one of the sources of government revenue around the globe. Crude oil is one of the essential natural resources that bring about growth and development in both developed and developing economies. The exploration of oil to a great extent play critical role in the progress and development of general public and countries around the world. The importance of oil has risen to the extent that in a world suddenly without crude oil, all the major distribution system that induce economic transactions on a more than local basis would fall and the world economy would collapse ((Ewubare & Obayori, 2019; Gronwald, 2008).

In Nigeria, oil is the major source of foreign exchange earnings and dominant source of revenue for the government in which its high dependence serve as the basis upon which revenue distribution, budgeting, and capital allocations are determined in the country. Oil export revenues, representing about 90 per cent of total

export earnings and on average about 70 per cent of government revenues in annual budgets (Ibrahim, 2018).

Meanwhile, Nigeria is one of the countries heavily affected by the sharp decline in the revenue vis-à-vis the fall in the price of crude oil. It is recalled that, over the years, oil revenues are the main source of financing government expenditures and for importation of products to the country. Specifically, on average, 75% of government revenues come from oil export (Adedokun, 2018; Nweze & Edame, 2016). As such, the budget is usually affected by sudden negative or positive shocks to the oil prices. For instance, in about 20 months (that is, from second quarter of 2014 to earlier 2016), the oil price has dropped rapidly from as high as about 130 dollars per barrel to as low as 28 dollars in the earlier months of 2016. As a matter of fact, the variation in oil price is so severe that the budget is even tied to a particular price of crude oil and the budget was adjusted in some occasions when there is sudden changes in crude oil prices such as the reduction of budget due to fall in oil prices during the last global financial crisis. Based on this, the objective of the study is to examine the impact of oil on government expenditure in the Nigerian economy.

1.1 Statement of the Problem

The major objective of Nigerian government is to promote societal welfare by means of appropriate economic, political, social and legal programmes. These programmes, however, have led to expansion in public expenditure size in the Nigeria economy characterized with a weak and uncompetitive private sector. Given the fact that the major source of financing government expenditure is revenue from crude oil. But the change in oil price has been found to affect most macroeconomic variables of the Nigerian economy. While oil production would benefit Nigeria as an oil producing country through revenue earnings from oil sales, it may also have long term effect on the structure and composition of the country's total output and significantly affect exchange and inflation rates since the oil sale is dominated by the US dollar (Volkov & Yuhn, 2016)..

Meanwhile, empirical evidence provides that oil which accounts for about 90 per cent of total export earnings, and about 70 per cent of government revenues in annual budgets is expected to increase the level of employment while reducing the rate of unemployment, inflation and poverty in Nigeria. Nevertheless, the adverse effect of the fall in crude oil price resulted in decline production in Nigeria that made output growth in Nigeria fell by 1.1% in December 2015 to −1.2% in the first quarter of 2016, a trend that continued till the end of the first quarter of 2017 (Central Bank of Nigeria (CBN, 2017)

Given the background above, the basic objective of the study is to examine the impact of crude oil revenue on government expenditure in the Nigerian economy. The remaining parts of this work examined literature review, method of analysis, analysis of findings and conclusion.

2. LITERATURE REVIEW

Theoretically, the study was based on Wagner's Law of increasing state activity. Adolf Wagner (1835-1917) was a German market analyst who based his law of expanding State Activities on historic statistic, fundamentally of Germany. As indicated by Wagner, there are characteristic propensities for the exercises of various layers of a legislature, (for example, federal, state and grass-root governments) to increase both seriously and broadly. There is a utilitarian connection between the development of an economy and government exercises with the outcome that the administrative area becomes quicker than the economy.

Meanwhile, Musgrave accepts that Wagner was considering extent of public sector in the economy. Wagner's (1958) proposed and as well finished up with exact proof that it was similarly appropriate to a few other government which are in contrast broadly from each other's. A wide range of government independent of their levels, intensions and size, and so on, had shown a similar inclination of increasing public-expenditure.

Empirical evidences on oil and government expenditure and other related economic variables abound. For instance, Ibir and Aluthge (2019) examined the determinants of government expenditure in Nigeria. The study uses time series data for Nigeria spanning between 1970 and 2017. Time series data were analysed using Autoregressive Distributed Lag (ARDL) model. The findings of the study reveal that oil revenue, GDP, population, trade openness, oil price, taxation and inflation are important determinants of the size of Nigeria's government expenditure Aregbeyen and Kolawole (2015) examined the relationships among oil revenue, government spending, and economic growth in Nigeria. By implication, it investigated whether oil revenue impacted on government spending, as well as on economic growth in the country over the period from 1980 to 2012. Time series data were analyzed using econometric techniques which included Ordinary Least Square (OLS), cointegration, Vector Error Correction Model (VECM), and Granger causality to determine the direction of causality and the magnitude of impacts of the variables. Findings from the analysis revealed that oil revenue Granger caused both of total government spending and growth, while there was no-causality between government spending and growth in the country.

Ehimare, Ogaga-Oghene, Obarisiagbon and Okorie (2014) reviewed government spending on human capital improvement and economic exercises in Nigeria. The study utilized ex post facto procedure dependent on least square test. The investigation uncovered that proficiency rate as caught by instruction enrolment has opposite association with human capital advancement, which could be clarified by the low productivity of government consumption in the training sector, suggesting that such government spending on education decreasingly affects learning performance. Also, Loto (2011) examined the effect of sectoral government consumption on financial development in Nigeria for the period, 1980-2008 and applied Johansen co-integration procedure and ECM. The outcomes showed that in the short run, consumptions on agriculture and education was not significant with financial development.

2.1 Nigerian Government Expenditure Profile between 1960 and 2019

The trend of public expenditure in Nigeria over the years has been characterized by steady and continuous increase in the expenditure side of the budget. For instance, government expenditure was ₦314.41 billion on average between 1960 and 1970 but rose to ₦5972.90 billion between 1971 and 1980 representing 1799.7% growth in government expenditure during the decade of 1970s (CBN, 2017). The expansion can be associated with the discovery of oil in the early 1970s that led to unprecedented increase in Nigeria's revenue. Additionally, government budgeted large monies for reconstruction after the 1960s civil war that lasted for about 30 months. The country also embarked on increase in spending on priority sectors to provide an enabling environment needed to accelerate sustainable growth and development.

Besides, government expenditure was ₦11,188.42 billion on average between 1981 and 1985 representing the growth rate of 87.3% (CBN, 2017). Furthermore, public

expenditure exhibited upwards trend despite countless efforts by government to reduce its expenditure particularly through the structural adjustment program (SAP) in 1986 which focused on shortterm and medium-term policy reforms to structurally adjust the economy. Public expenditure continued to maintain steady and upwards trend from 1986 to 1991. Total government expenditure was ₦11,413.7 billion in 1986 but by 1990, it slightly increased to ₦66,584.4 billion representing 10% increase (CBN, 2017). This development could be attributed to the volatile revenue base of government and large fiscal deficits which resulted to decrease in government expenditure. Aregbeyen and Kolawole (2015) posit that after the implementation of SAP, which marked the post-liberalization era in 1986, strict measures were put in place to curb government spending. This includes reduction in wage bills, reduction in government subsidies, limiting or delaying investment projects and privatization/commercialization. That has indeed reflected in the expenditure pattern as government expenditure growth rate was on average 31.1% between 1986 and 1991 compared with the growth rate of 87% between 1981 and 1985.

However, in the period 1991–1995, government made effort to reduce inflation rate by avoiding large budgetary deficits, which made government expenditure more cost-effective and consistent with the nation resources. In fact, public expenditure reduced from ₦191,228.90 billion in 1993 to

₦160,893.20 billion in 1994 representing −15.9%growth rate in government expenditure (CBN, 2017).

Lastly, from 2000 to 2019, government expenditure continues to increase unabated. Throughout the period, government expenditure maintained a rising trend. Public expenditure was ₦701,059.40 billion and rose immensely to ₦4,813,380.00 billion from 2000 to 2016 respectively. Also, public expenditure which was ₦7813.74 billion in 2018, declined to ₦6709.67 billion in 2019 (CBN, 2018). Average growth rate of government expenditure was 19.2% between 2001 and 2010 (CBN, 2017).

Public expenditure has been continuously increasing in this period because of the increased demand for the provision of socioeconomic services due to the population growth, increase in the flow of revenue from the production and sales of crude oil as a result of high price of crude oil in the international market, expenditure on election and the desire of policymakers and political leaders to meet the aspiration of citizens as well as to fulfil election promises.

3. METHODOLOGY

The study adopted the ex-post facto research design as data for the study are already established. Data for this study is secondary in nature and was sourced from relevant documentations of the federal government namely the statistical bulletin of the Central Bank of Nigeria. The data for this study covered a period of 1999 to 2019. Data on oil was proxied by oil revenue and that of government expenditure was proxied by total government expenditure. The Generalized Method of Moments (GMM) estimation technique was employed because of its ability to avoid biased results due to correlation between the error term and the endogenous variable. Meanwhile, the Augumented Dickey Fuller unit root test preceded the GMM test in order to ascertain the stationarity of the variables and fit them for regression analysis.

Model Specification

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The GMM model (equation) was specified Non-linear form in order to put the variable on the same scale as follows:

$$LnGXP_t = \lambda_0 + \lambda_1 LnORV_t + U_t \quad (3.1)$$

Where; GXP is government expenditure, ORV is oil revenue, U is Error Term, λ_1 is Slope Parameter and λ_0 is Intercept Parameter.

4. ANALYSIS OF FINDINGS

Table 4.1 Result of Augmented Dickey Fuller Unit Root Test at Level and First Difference

Variables	ADF @ Lev	5% Criti Value	Decision	ADF @ Diff	5% Criti Value	Decision
GXP	-0.202013	-3.020686	Not stationar	-3.958373	-3.065585	Stationary I(1)
ORV	-2.230618	-3.040391	Not stationar	-4.271017	-3.052169	Stationary I(1)

Source: *Author's Computation from E- view 10*

The unit root test for stationarity of each of the series via the ADF test as presented in Table 4.1 showed that both the dependent and independent variables were not stationary at order zero (at level). The variables that were not stationary at level were differenced once and they became stationary at first difference prior to estimations of the GMM to prevent false regressions results.

Table 4.2: Analysis of Generalized Method of Moments Result

Dependent Variable: Government Expenditure (GXP)			
Variables	**Coefficients**	**t-statistics**	**Probability**
C	1.655498	1.517516	0.1465
Log(ORV)	0.760136	5.862876	0.0000
R-Squared	0.57211	F-statistics	4.2636
Durbin Watson	1.288	Prob(F-statistic)	0.038936

Source: *Author's Computation from E- view 10*

In exploring the dynamic long run effect of oil on government expenditure in the Nigerian economy, the generalized method of moments (GMM) was applied. Thus, the GMM results in Table 4.2 showed that the value of oil revenue (proxied for oil) has a positive and significant effect on government expenditure. Thus, a percent increase in oil revenue causes an increase in government expenditure by 76%. Also, oil revenue P-value of 0.0000 is less than 0.05 critical value. Thus, the alternative hypothesis, which states that there is a significant relationship between oil revenue and government expenditure was accepted.

The R-squared value of about 57% showed that variation in the independent variable explained by the dependent variable is 57%. The probability of f-statistic (0.03) was less than the value of 0.05, showed that the model is significant in explaining the relationship between oil and government expenditure. The Durbin Watson statistics value of 1.28, based on rule- of-thumb, implies that serial autocorrelation is a serious problem in the model.

5. CONCLUSION

This study examined oil revenue and government expenditure in Nigeria. Specifically, it investigated the impact of oil revenue on government expenditure in the country over the period 1999 to 2019. Econometric techniques which included unit root and GMM were employed to determine the magnitude of impacts. Findings from the analysis revealed that a percentage increase oil revenue causes total government expenditure to increase. The foregoing finding bears an important implication for policy formulation. Given the direct relationship between oil and government expenditure as well as significant impact, government needs to re-

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examine the shares of both capital and recurrent expenditure in total government spending coming from oil revenue. Over the years, the percentage of recurrent expenditure has over-blotted to the extent that more than 70 per cent of the country's budget was allocated to this item at the expense of capital spending. A situation of such can only bring about a mild nominal non-inclusive growth which has been the experience over the years. Therefore, given the huge revenue from oil, government should boost spending on developmental projects.

Appendix

Research Data

YEAR	ORV(₦ Billion	TGX(₦ Billion
1999	724.42	947.69
2000	1591.68.	701.65
2001	1707.56	1018.00
2002	1230.85	1018.18
2003	2074.28	1225.99
2004	3354.80	1426.20
2005	4762.40	1822.10
2006	5287.56	1938.00
2007	4462.91	2450.90
2008	6530.60	3240.82
2009	3191.94	3452.99
2010	5396.09	4194.58
2011	8878.97	4712.06
2012	8025.97	4605.39
2013	6809.23	5185.32
2014	6793.82	4587.39
2015	3830.10	4988.86
2016	2693.90	5858.56
2017	4109.80	6456.70
2018	5545.80	7813.74
2019	4116.5	6709.67

Source: *CBN Statistical Bulletin (Volume 29, 2018)*

Dependent Variable: LOG(TGX)

Method: Generalized Method of Moments

Date: 07/26/21 Time: 11:34

Sample: 1999 2019

Included observations: 20

Linear estimation with 1 weight update

Estimation weighting matrix: HAC (Bartlett kernel, Newey-Wes

bandwidth = 3.0000)

Standard errors & covariance computed using estimation weight

Instrument specification: LOG(TGX) C LOG(ORV)

Variable	Coefficien	Std. Error	t-Statistic	P
C	1.655498	1.090926	1.517516	0
LOG(ORV)	0.760136	0.129652	5.862876	0

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R-squared	0.572110	Mean dependent var	8.007456	Observations	20	20
Adjusted R-squared	0.542783	S.D. dependent var	0.701940		
S.E. of regression	0.523977	Sum squared resid	4.941938		
Durbin-Watson stat	1.288057	J-statistic	4.263637		
Instrument rank	3	Prob(J-statistic)	0.038936		

Unit Root Test

Null Hypothesis: TGX has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

DESCRIPTIVE

	TGX	ORV
Mean	3682.657	4476.375
Median	3823.785	4289.705
Maximum	7813.740	8878.970
Minimum	947.6900	724.4200
Std. Dev.	2136.054	2230.861
Skewness	0.221234	0.169148
Kurtosis	1.889804	2.301629
Jarque-Bera	1.190260	0.501806
Probability	0.551491	0.778098
Sum	73653.14	89527.50
Sum Sq. Dev.	86691782	94558105

		t-Statistic	
Augmented Dickey-Fuller test statistic		-0.202013	0
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(TGX)

Method: Least Squares

Date: 07/26/21 Time: 11:22

Sample (adjusted): 2000 2019

Included observations: 20 after adjustments

Variable	Coefficien	Std. Error	t-Statistic	P
TGX(-1)	-0.012175	0.060271	-0.202013	0

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C	329.2796	238.5853	1.380134	0.1844

R-squared	0.002262	Mean dependent var	288.0990
Adjusted R-squared	-0.053168	S.D. dependent var	540.2193
S.E. of regression	554.3945	Akaike info criterion	15.56827
Sum squared resid	5532359.	Schwarz criterion	15.66784
Log likelihood	-153.6827	Hannan-Quinn criter.	15.58771
F-statistic	0.040809	Durbin-Watson stat	2.024804
Prob(F-statistic)	0.842172		

Null Hypothesis: D(TGX) has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.958373	0.0093
Test critical values:	1% level	-3.920350	
	5% level	-3.065585	
	10% level	-2.673459	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 16

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(TGX,2)
Method: Least Squares
Date: 07/26/21 Time: 11:22
Sample (adjusted): 2004 2019
Included observations: 16 after adjustments

Variable	Coefficien	Std. Error	t-Statistic	P
D(TGX(-1))	-2.632306	0.664997	-3.958373	0
D(TGX(-1),2)	1.281313	0.665950	1.924037	0
D(TGX(-2),2)	1.339731	0.559015	2.396594	0
D(TGX(-3),2)	0.931367	0.357071	2.608356	0
C	838.8039	246.8598	3.397895	0

R-squared	0.762449	Mean dependent var	-8
Adjusted R-squared	0.676067	S.D. dependent var	8
S.E. of regression	489.1820	Akaike info criterion	1
Sum squared resid	2632290.	Schwarz criterion	1
Log likelihood	-118.7892	Hannan-Quinn criter.	1
F-statistic	8.826473	Durbin-Watson stat	1
Prob(F-statistic)	0.001915		

ORV

Null Hypothesis: ORV has a unit root

Exogenous: Constant

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Lag Length: 0 (Automatic - based on SIC, maxlag=4)

Included observations: 18 after adjustments

		t-Statistic
Augmented Dickey-Fuller test statistic		-2.230618
Test critical values:	1% level	-3.857386
	5% level	-3.040391
	10% level	-2.660551

Variable	Coefficien	Std. Error	t-Statistic
ORV(-1)	-0.408982	0.183349	-2.230618
C	2058.014	944.6855	2.178518

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for observations

and may not be accurate for a sample size of 18

	R-squared	0.237211	Mean dependent var
	Adjusted R-squared	0.189537	S.D. dependent var
	S.E. of regression	1633.890	Akaike info criterion

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ORV)

Method: Least Squares

Date: 07/26/21 Time: 11:23

Sample (adjusted): 2002 2019

			t-Statistic
		Augmented Dickey-Fuller test statistic	-4.271017
Sum squared resid	42713537	Schwarz criterion	Test critical values: 1% level -3.886751
			5% level -3.052169
			10% level -2.666593
Log likelihood	-157.6578	Hannan-Quinn criter.	*MacKinnon (1996) one-sided p-values.
			Warning: Probabilities and critical values calculated fo observations
			and may not be accurate for a sample size of 17
F-statistic	4.975655	Durbin-Watson stat	Augmented Dickey-Fuller Test Equation
Prob(F-statistic)	0.040371		Dependent Variable: D(ORV,2)
			Method: Least Squares
Null Hypothesis: D(ORV) has a unit root			Date: 07/26/21 Time: 11:23
Exogenous: Constant			Sample (adjusted): 2003 2019
Lag Length: 0 (Automatic - based on SIC, maxlag=4)			Included observations: 17 after adjustments

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Variable	Coefficien	Std. Error	t-Statistic			
D(ORV(-1))	-1.117671	0.261687	-4.271017			
				Sum squared resid	54862315	Schwarz criterion
C	196.3116	467.5866	0.419840			
				Log likelihood	-151.5125	Hannan-Quinn criter.
R-squared	0.548758	Mean dependent var				
				F-statistic	18.24159	Durbin-Watson stat
				Prob(F-statistic)	0.000670	
Adjusted R-squared	0.518675	S.D. dependent var				
S.E. of regression	1912.456	Akaike info criterion				

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