

## Effect of Public Sector Credit on Economic Growth: Empirical Evidence from Nigeria

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### Abstract:

*The paper investigates the impact of public sector credits on economic growth in Nigeria over the period 1987-2013. The Engel and Granger residual approach were employed to establish if the variables have long-run relationship. Descriptive statistics and the Augmented Dickey-Fuller unit root test were adapted to test for normality and for stationarity respectively. The error correction model (ECM) estimation technique was used for the regression. The results from this paper shows that deposit money bank credit to the public sector have negative and non-significant impact on economic growth in Nigeria within the period under study. Meanwhile, broad money supply has positive and non-significant impact on economic growth. A long run relationship was also established among the variables. The correlation matrix revealed the existence of positive relationship between public sector credit and economic growth. This study will therefore recommend that there should be adequate monitoring of credits channeled to the public sector to ensure that they are judiciously appropriated in such ways that will enhance the creation of goods and services which would stimulate economic growth.*

**Key words:** Public sector credit, money supply, Economic Growth, Error Correction Model, Nigeria

## INTRODUCTION

The existence of public sector can be attributed to the prevalence of political and social ideologies, which depart from the premises of consumer choice and decentralized decision-making (Ajibola, 2008). Against this backdrop, a major activity of the government includes the determinant of the optimal financing of public goods under a democratic society. One of the sources of public sector finances includes external borrowing from banks and other financial institutions (Onuoha, 2005).

According to Bhatia (2002), in an underdeveloped country, public expenditure has an active role to play in stimulating the economy through the provision of infrastructure facilities. In his own contribution, Taiwo and Abayemi (2011) wrote that the mechanism in which government spending on public infrastructure is expected to affect the pace of economic growth depend on the precise form and size of total public expenditure allocated to economic and social development projects in the economy. This effect, therefore, is basically in the nature of re-allocation of resources from less to more desirable lines of investment.

Musgrave and Musgrave, (1980) postulate that it is interesting to pause and consider what may be said more sympathetically about the underlying causes of increasing public sector borrowings and expenditure growth. They maintained that high need for capital goods, technical changes, population change, relative costs of public services and changing scope of transfers are the major causes of expenditure growth in the public sector. However, as these basic facilities are built up and capital market developed, the path is cleared for capital formation of the manufacturing type to go into place

and for industrial development in the private sector to occur. Accordingly, one would expect the public share in capital formation to decline over time (Allen et al 1991).

Central Bank of Nigeria (2009) notes that flow of credit to the priority sectors fell short of prescribed targets and failed to impact positively on investment, output and domestic price level. Certainly, these comments have triggered questions on the effectiveness and productivity of bank credits on the Nigerian economy. In the same vein, there remains a gap in understanding the impact of the banking system credit to the public sector on economic growth in Nigeria while, also, the relationship between the two have received little interest from researchers and, therefore, need to be empirically investigated. In similar perspective, Taiwo and Abayomi (2011) note that the justification of public sector credits is for the provision of infrastructural facilities, which will consequently drive economic growth. However, they further posit that the effects of such government spending on economic growth are still an unresolved issue theoretically as well as empirically.

The fewness of studies on public sector credit and economic growth nexus has continued to create huge knowledge gap in finance literature. In other words, the relation and linkage between deposit money bank credit to the public sector and growth of the economy has specifically suffered some neglect and oversight. While a number of literatures assessed the contribution of private sector, or aggregate bank credit to growth, few discourses have given attention to the subject. The vacuum thereof has necessitated this study with a view to contributing to the existing knowledge.

## **LITERATURE REVIEW**

The world economies have at one time or the other been visibly hit by recession, which subsequently posed hindrances to economic growth and development. Sequel to these

developments, the public sector has received intense interest in financial literature. This can evidently be attributed to the roles that the public sector plays, directly or indirectly, in promoting economic growth. Public sector is often used interchangeably with government sector. As opposed to the private sector, the public sector encompasses all the people in a country. Mohammed and Umar (2002) elaborated on public sector by emphasizing that it is referred as such because in this modern democratic era, the government is the only association in which all the people of a country have the same right to access to all the amenities provided by it whether they are rich or poor. The public sector operations include local, state, and federal governments' activities.

The role of the public sector in fostering economic growth is very crucial. It assumes even greater responsibilities when the economy is retarding. Hence, engendering innovating values, entrepreneurial revolution, modernization and industrialization have become vital areas the public sector works on, while introducing changes in different sectors in order to increase their productivity (Jan and Syed, 2002).

It is a popular postulation that increased public investment is necessary for boosting economic activities and increasing the overall output in an economy. However, in spite of these developments, the effects of public investments on output growth are still empirically ambiguous. The investment activities of the public sector establish foundations for economic growth and development. Their impact comes from both direct and indirect effects – either through increased employment and wages and the rise of productivity of the private sector (Drezgic, 2008).

## **EMPIRICAL REVIEW**

Economic literature is replete with possible qualitative and quantitative explanatory variables that influence growth rate

per capita output over time. Tuuili (2002) for example, uses the ratio of banks' claims on private sector to GDP, annual consumer price index, and the interest rate margin to analyze the relationship between finance and economic growth. The models specified by Balogun's (2007) theoretical models were more expansive and included money supply, minimum rediscount rates, private sector credit, ratio of banking sector credit to the government, ratio of stock market capitalization to credit to the private sector, and exchange rates.

Fapetu and Obalade (2015) investigated the impact of sectoral allocation of deposit money bank loans and advances on economic growth in Nigeria. Regression analysis of the ordinary least square method was used. The results showed that only the credit allocated to government, personal and professional have significant positive contributions on economic growth during the intensive regulation. However, it was revealed that bank credits generally have no significant contribution to economic growth during deregulation regime in Nigeria.

Ezeaku (2014) examined the impact of bank credit on economic growth in Nigeria using time series data from 1987 to 2012. The OLS regression econometric technique was used in analyzing the data. The estimated regression results indicated that aggregate bank credits impacted positively and significantly on economic growth over the period of the study. Among other things, the study recommended that policies on public sector borrowing and spending should be reviewed in order to discourage credit diversion, mitigate gross unproductive investments and that more credit be channeled into subsectors with more evident linkage effect such as agriculture, manufacturing, energy and infrastructural development.

In a related study, Yakubu and Affoi (2013) analyzed the impact of the commercial banks credit on economic growth in Nigeria using data from 1992 to 2012. The ordinary least

square econometric technique was employed in analyzing the data. It was shown that the commercial bank credit has significant impact on the economic growth in Nigerian.

Emecheta and Ibe (2014) examined the impact of bank credit on economic growth in Nigeria employing the reduced form of vector autoregressive (VAR) technique using time series data between 1960 and 2011. Real GDP was the proxy for economic growth while ratios of private sector (CPS) to GDP ratio and M2 to GDP were proxies for financial indicator and financial depth respectively. The study found that there is a positive and significant relationship between bank credit to the private sector, broad money and economic growth in Nigeria.

Oluitan (2012) assessed the significance of bank credit in stimulating real output growth in the case of Nigeria. The study observed that credit Granger causes output. There was also indication that credit is also positively associated to capital inflows and imports. The findings suggested that bank credit is strongly linked to the opening of the economy to international trade and capital flows.

Obamuyin, Edun and Kayode (2010) investigated the effect of bank lending and economic growth on the manufacturing output in Nigeria. Times series data covering a period 1973 to 2009 were collected and tested with the co-integration and vector error correction model (VECM) techniques. The findings of the study revealed that manufacturing capacity utilization and bank lending rates have significant effect on manufacturing output in Nigeria.

According to Bayraktar and Wang (2006), banking sector openness had a direct and indirect effect on economic growth through a combination of improvement in access to financial services, and the efficiency of financial intermediaries as both of these cause a lowering of costs of financing which in turn stimulates capital accumulation and economic growth. Guryayet, *et al.*, (2007) also found that the effect of financial

development on economic growth of Northern Cyprus although positive, was negligible.

Shan and Jianhong (2006) in their study of the Chinese economy found a two-way causality between finance and economic growth. With the aid of VAR technique and using five variables namely: GDP, total credit to the economy, labour, investment and trade, the study observed that financial development was the second most important factor after the contribution from labour force growth in affecting economic growth. They also found that strong economic growth in the last twenty years has significant impact on financial development by providing a solid credit base.

## **METHODOLOGY AND DATA**

The study will be treated as an *ex post facto* research since the study will rely on historical data covering the period under study, whereas Ordinary Least Square technique will be used in analyzing our data. Data for this study is extracted from the Central Bank of Nigeria Statistical Bulletins. Ratio of public sector credit to real GDP and broad money supply to real GDP ratio are the independent while real GDP is the dependent variable. In other to avoid a spurious result, Augmented Dickey-Fuller (ADF) will be used to test for stationarity. Diagnostic tests will also be run to authenticate the reliability of our model, and results. The relevant diagnostic tests will include serial correlation LM test, Heteroskedasticity Test: Breusch-Pagan-Godfrey, and Ramsey Reset test.

### **Model Specification**

After selection of the aforementioned variables, we can describe the economic growth function of Nigeria in the following way:

$$RGDP_t = f(PSC/RGDP_t, M2/RGDP_t) - \text{-----} \quad (1)$$

The model and functional relationships for equation (1) is therefore specified thus:

$$RGDP_t = \beta_0 + \beta_1PSC/RGDP_t + \beta_2M2/RGDP_t + \varepsilon_t \text{------(2)}$$

Where;

- RGDP<sub>t</sub> = Real Gross domestic product at time t.
- PSC/RGDP<sub>t</sub> = Public sector credit to real GDP ratio at time t
- M2/RGDP<sub>t</sub> = Broad money stock to real GDP ratio at time t
- β<sub>0</sub> = Constant term.
- β<sub>1</sub>& β<sub>2</sub> = Coefficients of the explanatory variable.
- ε = error term

## RESULTS AND ANALYSIS

In this section, results are presented and analyzed.

**Table 1. DESCRIPTIVE STATISTICS**

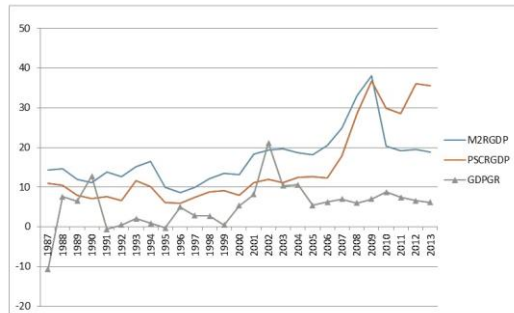
	<b>GDPGR</b>	<b>PSCR GDP</b>	<b>M2RGDP</b>
<b>Mean</b>	5.390370	14.90741	17.25556
<b>Median</b>	6.200000	11.10000	16.50000
<b>Maximum</b>	21.17700	36.70000	38.00000
<b>Minimum</b>	-10.75200	5.900000	8.600000
<b>Std. Dev.</b>	5.597604	10.07170	6.620849
<b>Skewness</b>	-0.072848	1.235984	1.501238
<b>Kurtosis</b>	5.642442	2.956343	5.521769
<b>Jarque-Bera</b>	7.879193	6.876599	17.29595
<b>Probability</b>	0.019456	0.032119	0.000175
<b>Sum</b>	145.5400	402.5000	465.9000
<b>Sum Sq. Dev.</b>	814.6624	2637.419	1139.727
<b>Observations</b>	27	27	27

Source: Authors' 2016.

Table 1 shows some of the preliminary statistical indicators in our model variables. On average, the economic growth rate during 1987-2013 equals 5.4%, while the highest growth rate in GDP during the period remains at 21.12% with lowest growth rate at -10.75%. The ratio of public sector credit to real GDP equals 14.9% and the ratio of broad money supply to real GDP



equals 17.3%. As revealed from table 4.1, there was a negative skewness of GDP growth rate (-0.07) indicating that the degree of departure from symmetry of the distribution was negative. But, the kurtosis value of 5.6 reveals that the degrees of peakedness of GDPGR within the period of this study were not normally distributed as it tended to deviate from the mean.



**Figure 1 Graphical Representation of model proxies**

Source: Authors’ 2016.

**(i) Unit root test**

Test for unit root was carried out on the variables in order to ascertain their stationarity, which is a condition for subjecting the variables to further tests. The essence is that, given that we are dealing with time series data, we need to avoid any chance of producing spurious results, and also check against autocorrelation problems in order to authenticate the reliability of our results. The Augmented Dickey-Fuller unit root test was used to find out if the data is stationary.

**Table 2. Augmented Dickey-Fuller Unit Root Test**

Variable	ADF Test Statistic	1% Critical Value	5% Critical Value	10%critical Value	Test for Unit Root	Durbin-Watson stat
GDPGR	-4.998676	-3.752946	-2.998064	-2.768752	1(1)	1.981585
PSCRGDP	-4.926836	-3.724070	-2.991878	-2.605542	1(1)	1.742738
M2RGDP	-4.607165	-3.674839	-2.986225	-2.592604	1(1)	1.661823

Source: Authors’ 2016.

Table 2 shows that the variables are all stationary at first difference, 1(1). It can be seen that for each of the variable, the calculated ADF test statistic is less than the critical values at 1%, 5% and 10%, which confirms their stationarity. The results are also free from problems of autocorrelation as indicated by the Durbin-Watson stat values, which are approximately equal to the critical value of 2.0.

**(ii) TEST FOR CO-INTEGRATION**

Engel and Granger residual based approach was used to establish the presence of co-integration among the variables as shown below:

**Table 3 Engel and Granger test for co-integration**

Null Hypothesis: RESID01 has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=0)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.068242	0.0004
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

Source: Authors' 2016.

The outcome of the Engel and Granger co-integration test above indicates that model 3 is a long-run model. Notably, the residual of the short-run regression is subjected to a unit root test and is stationary at level, at 1%, 5% and 10% critical values. This reveals evidence of long-run relationship in our model equation. In other words, GDPGR, PSCR GDP and M2RGDP are co-integrated, and the model is a long-run model. Hence, error correction model will be employed in assessing the effects of the regressors on the regressand.

**Table 4 CORRELATION MATRIX**

VARIABLE	GDPGR	PSCR GDP	M2RGDP
<b>GDPGR</b>	1.000000		
<b>PSCR GDP</b>	0.203934	1.000000	
<b>M2RGDP</b>	0.282623	0.731558	1.000000

Source: Authors' 2016.

As revealed by table 4, GDPGR has a positive relationship with CPS/RGDP and M2/RGDP. This implies that 1% increase in GDP growth rate increases over the period in Nigeria is due to 20% and 28% increase in CPS/RGDP and M2/RGDP respectively. It is also indicated that CPS/RGDP and M2/RGDP are positively correlated. In other words, 1% increase in ratio of broad money supply to real GDP brings about a 73% increase in public sector credit to real GDP ratio.

**Table 5 REGRESSION RESULTS**

Error Correction Model

Dependent Variable: D(GDPGR)				
Method: Least Squares				
Included observations: 26 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.731142	0.946728	0.772283	0.4482
D(PSCR GDP)	-0.122037	0.372400	-0.327704	0.7462
D(M2RGDP)	0.120596	0.310735	0.388099	0.7017
ECT(-1)	-0.811839	0.168530	-4.817173	0.0001
R-squared	0.515110	Mean dependent var		0.652000
Adjusted R-squared	0.448988	S.D. dependent var		6.140370
S.E. of regression	4.558007	Akaike info criterion		6.012286
Sum squared resid	457.0594	Schwarz criterion		6.205839
Log likelihood	-74.15972	Hannan-Quinn criter.		6.068023
F-statistic	7.790360	Durbin-Watson stat		1.663480
Prob(F-statistic)	0.001004			

Source: Authors' 2016

**Model Equation:**

$$\text{GDPGR} = 0.731142 - 0.122037\text{PSCR GDP} + 0.120596\text{M2RGDP} - 0.811839$$

(0.7462)\*
(0.7017)\*

Note: \* (p-values)

The result in table 5 above reveals that the overall regression model is significant. This is evidenced by the probability of F-statistic (0.001004), which is less than 5%. This result is reliable also because the Durbin-Watson statistic (1.663480) is very significant as it is approximately 2.0, which confirms that the regression does not have autocorrelation problems. It is also noteworthy that the error term (ECT), which is the residual value, is negative and significant. This indicates a movement towards attainment of long-run equilibrium in our model. Sequel to this, the residual (ECT) coefficient (-0.811839), which is the speed of adjustment, shows that 81% of the errors in the long-run is corrected over one year period.

The results further indicate that public sector credit (PSCR GDP) does not have positive impact on economic whereas broad money supply (M2RGDP) has a positive but non-significant impact on economic growth over the period of this study.

The  $R^2$  in the regression assumes that every regressor in the model explains the dependent variable. From the model above, the  $R^2$  value of 0.515110 implies that 51 percentage variations in the dependent variable (GDPGR) was explained by the independent variables (PSCR GDP and M2RGDP) and the remaining 49% was explained by variables not included in the model. The adjusted  $R^2$  take account of more number of regressors if included and it still explains 45% variation in the dependent variable.

### (iii) Diagnostic Results

**Table 6 DIAGNOSTIC TEST RESULTS**

Test	F-statistic	P-value
Breusch-Godfrey Serial Correlation LM Test	0.371931	0.6431
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.427770	0.6283
Ramsey RESET Test	1.516473	0.2306

Source: Authors' 2016.

Results in table 6 above reveal that our model has no serial autocorrelation problem. It can also be observed that the results provide strong evidence that the model did not violate the assumption of homoskedasticity and we therefore reject the null hypothesis that the model is not homoskedasticity. The results of the Ramsey test indicate that our model has no specification errors, and is therefore well specified.

## **IMPLICATIONS, CONCLUSION AND RECOMMENDATIONS**

There are very few studies in literature that sought to examine the effect banking system loans and advances to the public sector have on economic growth. The public sector in Nigeria, which comprises the local, state and central government have often sought for credit from deposit money banks as a way of bridging financing gaps, and with the perceived aim of enhancing growth through investment, empowerment and developmental projects. The theoretical expectation however is that such activities would translate to rapid, or some measure of growth of the domestic economy. Most of the qualitative researches by public sector administrators and social scientists have only succeeded in giving us theoretical postulations and opinions on public sector financial habit without elucidating an empirical scientific approach in assessing the link between public sector credit and economic growth. After exploring various econometric techniques, it was revealed that PSCGDPGR and M2RGDP have positive relationship with GDP. The results also showed that public sector credit has negative and non-significant impact on economic growth in Nigeria. This can be attributed to the fact that chunk of the loans and advances to the public sector may have been diverted or misappropriated. Such facilities may have also been invested in white elephant project and such other ventures that do not create value hence do not lead to increase in output. This very finding has raised doubt on the justification for public sector

borrowings. The argument therefore is that if public sector credit has no positive contribution to growth in GDP, is there any reason why such facilities should be encouraged? However, broad money supply has positive and non-significant effect on growth. We also found out that there exist a long-run equilibrium relationship between PSCR GDP and M2R GDP, and GDPGR. This study will therefore recommend that there should be adequate monitoring of credits channeled to the public sector to ensure that they are judiciously appropriated in such ways that will enhance the creation of goods and services which would stimulate economic growth.

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