



## Research Article

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# Primary School Enrolment, Public Spending on Education and Economic Growth in Nigeria

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## Abstract

This paper investigates the effect of primary school enrolment and public education spending on Nigeria's economic growth using the Autoregressive distributed lag model (ARDL) for the period 1987 and 2017. The coefficient of the error correction model (ECM) reveals a negative sign of -0.304216 which implies that any disequilibrium in the system in the previous year will be corrected at a speed of 30.42 percent annually. Both the short run and long run models were nicely fitted with high coefficients of determination ( $R^2$ ) of about 62 percent. The analysis of the result also showed that primary school enrolment rate and public expenditure on education increased but their effects were less impactful on Nigeria's economic growth. These findings perhaps could be attributed to the poor state of classrooms across, poor teacher-pupil ratio, unstable macroeconomic environment, dearth of instructional materials and more. The paper thus recommend that there should be re-design of educational strategies by the government to include enrolment campaigns, alternative learning programs, pro-poor economic incentive and more, especially at the basic education level and also increased her budgetary allocation to education sector in line with UNESCO recommendation of about 26 percent.

**Keywords:** Education, Primary School Enrolment, Public Education Spending, Human capital and Economic Growth

## 1. Introduction

A good educational system usually composed of kindergarten; primary, secondary and higher institutions can provide the needed human capital of countries. The educational system is usually structured in-line cultural heritage, national philosophy, etc. It is an ingredient that promotes countries' economic progress. One important component of the education system is the primary school. The primary school education is the fundamental and compulsory stage in developing economies (Nigeria inclusive). It is expected that all children should have access to it.

Like most countries, the Nigerian government has made primary education free and accessible to all via state owned schools. This is made possible with the introduction of Universal Basic Education in 1999. The strategy was put in place after many failed attempts in improving education in the country (MargCsapo, 1983). Considering the relevance of primary school education (Ihugba, Ukwunna & Obiukwu; 2019) to the society, they suggests that it breaks the shackles of poverty and

ignorance. Primary school education is the starting process of literacy from childhood to adulthood (Adebisi; 2006).

To remedy socio-economic problems, therefore, the government at various times had intervened to either subsidize or direct fund the educational sector in Nigeria. Not less than 40 percent of Nigerians are living below the poverty line reports the National Bureau of Statistics (NBS, 2019). This informs why they cannot afford to send their children to quality schools that are mostly owned by private individuals.

Available data on public expenditure in education revealed that between 2005-2007 and 2011-2017, the percentage of it was around 6.3%, 7.8%, 8.7%, 9.3%, 9.86%, 10.1%, 10.5%, 10.7%, 7.9% and 7.4% respectively (Mba, Mba, Ogbuabor & Ikpegbu., 2013). These have caused a significant number of schools in Nigeria to be below standard and not fit for academic learning. Thus, the objective of this paper is to empirically investigate the effect of primary school enrolment and public education spending on economic growth in Nigeria between the period 1987 and 2017. The rest of the paper is structured in 4 parts. Sections 2 and 3 dwell on review of related literature and materials and method. In Section 4 and 5, results and discussion as well as concluding remarks were made.

## 2. Review of Related Literature

Linking how pupils enroll in primary school and the attendant public expenditure on education to enhance economic growth in an economy is a herculean task, thus, create divides among economists. In the year 1960, Theodore W. Schultz formulated a human capital theory for explaining economic growth of countries. Human capital as expressed by Theodore W. Schultz is the knowledge and skills that individuals acquire through education and training. It is a form of capital and can be developed through deliberate investment in education and can yield returns. Models using the human capital theory (See Blinder and Weiss, 1976; Heckman, 1976) assume that human capital is homogeneous. The theory further assumes that education determines the marginal productivity of labour and this determines earnings of employees. Schultz (1963) therefore concludes that investment in people should produce returns

In recent years, most scholars like Netcoh (2016), thought differently about the basic assumptions of the Human capital theory. This is suggestive of the fact that higher levels of educational attainment and quality schooling might not necessarily yield greater productivity and wages in cross-country experiences. Today, several extant literatures had been developed to either support or refute the Schultz's (1963) thesis. For instance, at Turkey, Sedat (2012) studied economic growth and school enrollment rates covering the period 1980 and 2008 using the Toda-Yamamoto's (1995) causality technique and the result depicts a bidirectional relationship between the variables hence beckon policymakers to pay special attention to primary education at Turkey.

Majurnder (2016) did a research work on "Effect of Student teacher ratio on class time management in primary schools of West Bengal India" too. The use of descriptive statistics has it that the classroom environment can be hampered when poorly managed.. It was then recommended that the numbers of teachers to student ratio as against each class should be adequate so as to increase the standard of schooling.

In Nigeria, Omojimit's (2010) research work focused on education and economic growth: A Granger Causality Analysis based on data for the period 1980 and 2005. Applying the method of Cointegration and Granger Causality Tests, it revealed that public expenditures on education Granger cause economic growth but with no feed-back effect. The paper recommends improved funding for education and curriculum review to make it more productive.

In another paper entitled "Has education (human capital) contributed to the economic growth of Nigeria" by Adawo in 2011 based on the co-integration test was conducted too. It was shown that primary school input is an economic growth enhancer and called for adequate funding options and adjustment in admission process.

Okuneye's (2014) work on primary enrollment and economic growth in Nigeria adopted the

Ordinary Least Square estimation techniques. The result predicts primary school enrolment as a veritable tool for appreciable economic growth, hence, called on the government to adequately and conscientiously fund education. To further validate the relationship between government spending on education and economic growth in Nigeria, Nura and Mustapha (2015) relied on times series data. The outcome of the Johansen's co-integrated test and Error Correction model did established evidence of long run relationship between them and called for increased budgetary allocation to education.

Gylych (2016) analyzed the impactful effect of education on economic growth of Nigeria. The variables adopted were Real Gross Domestic Product, Capital Expenditure on Education, and Recurrent Expenditure on Education, Primary School Enrolment and Secondary School Enrolment and were further tested using Ordinary Least Squares (OLS). These variables impacted on GDP except primary school enrolment.

Omodero & Azubike (2016) carried out a research on the effect of government expenditure on education and economic development of Nigeria using the Ordinary Least Squares of Multiple regression too. The result indicated that expenditure on education is impactful on the economy and encouraged the government to properly use education as resource to better citizens' life in Nigeria.

Johnson & Wasiu (2016) investigated the effect of government expenditure on educational sector in Nigeria using the Ordinary least square multiple regression econometrics techniques too. The data used spanned from 1981 to 2013 and sourced from secondary sources. The major finding from the showed that the impactful effect of capital and recurrent expenditure on educational outcomes were negative in Nigeria. The study therefore recommends that fiscal discipline be deployed to checkmate corruption prevalent in the educational sector.

In Aigbedion, Iyakwari & Gyang's (2017), Ayeni & Omobude's (2018) and Ihugba's (2019) research works on the effect of education sector on the economic growth of Nigeria suggested a positive impact too. They beckon on the government to fully monitor education funds through viable institutional frameworks that are transparent.

### 3. Gap in Literature Reviewed

The related literatures reviewed in this paper were done to have an idea on the views of other scholars. The theoretical framework thus is based on the Human capital theory. From the findings of various empirical works reviewed there has been varying outcomes. To fill this gap, this paper studied simultaneously, how primary school enrolment and public expenditure on education affect economic growth. It also incorporates secondary school enrolment rate as a moderating variable in the model too.

### 4. Method of Study

#### 4.1 Nature and Sources of Data

This study made use of secondary data for both the dependent and independent variables. The data used and their sources are represented in Table 1.

**Table 1: Description of Data Set and Sources**

S/N	Name of the Variable	Description	Source
1	Real gross domestic product	This study adopts the use of real gross domestic product (RGDP) to denote economic growth.	Central Bank of Nigeria statistical bulletin (2018)
2	Public expenditure on education	These are direct expenditures on educational sector by the government.	Central Bank of Nigeria statistical bulletin (2018)

S/N	Name of the Variable	Description	Source
3	Secondary school Enrolment	This is measured as (UNECE, 2012) the ratio of children of official secondary school age who are enrolled in secondary school to the total population of a country's official secondary age.	UNESCO Institute for Statistics. (2020)
4	Primary school enrolment	This is used as expressed by (UNECE, 2012) the ratio of children of official primary school age, who are enrolled in primary school to the total population in a country's official primary school age	UNESCO Institute for Statistics. (2020)

Source: Authors' Compilation (2021)

#### 4.2 Analytical Framework

The Analytical framework for this study relies on the Postulations of the Human Capital Theory as earlier adopted in the scholarly work of Okuneye, Babatunde & Olukayode (2014). In Okuneye, Babatunde & Olukayode's (2014) work, a simple regression model was formulated to capture educational inequality and Economic growth in Nigeria between 1980 and 2010. The baseline simple regression model was expressed as:  $RGDP_{t=f} = f(PRYENR)$  (1);  $RGDP_t = \alpha_0 + \alpha_1 PRYENR + \mu$  (2).

Where, PRYENR represents educational inequality a symbol for primary school enrolment. RGDP is real Gross Domestic Product;  $\alpha_i$  stand for the coefficients and 'μ' stand for error term. The present study adopts equation (1) with some modifications. It does this by extending its scope to cover 1987 to 2017. Again, the present study adds Public Expenditure on Education and Secondary School Enrolment rate and relied on the method of ARDL to analyze the variables. Accordingly, the analytical model is formulated in the multiplicative form:

$$RGDP_t = \alpha_0 PEXE_{1i}^{\alpha_1} PSE_{2i}^{\alpha_2} SSE_{3i}^{\alpha_3} e_i \quad (3)$$

From equation (3), the transformed multiplicative growth model is:

$$\log RGDP_t = \alpha_0 + \alpha_1 \log (PEXE_{1i}) + \alpha_2 \log (PSE_{2i}) + \alpha_3 \log (SSE_{3i}) + e_i \quad (4)$$

Where: RGDP= Real Gross Domestic Product, PEXE= Public Expenditure on Education;

PSE= Primary School Enrolment; SSE= Secondary School Enrolment;  $\alpha_0$  = Constant term,  $\alpha_i$  = Coefficients of the explanatory variables, log =Natural log notation,  $e_i$ = Error terms. **Apriori:**  $\alpha_1 > 0$ ,  $\alpha_2 > 0$  and  $\alpha_3 > 0$

#### 4.3 Method of Data Analysis

The estimation of the hypothesized variables followed the econometric technique of descriptive statistics and Ordinary Least Square (OLS) method of multiple regression, under the classical multiple regression method of econometric analysis. The OLS method was considered because of the advantages associated with it such as the Best Linear Unbiased Estimate (BLUE). The unit root test is applied using the Augmented Dickey-Fuller (ADF) (1979) and Phillip Perron (PP) (1988), to test for stationary while the Autoregressive Distributed Lag (ARDL) Bound testing Co-integration test developed by Pesaran, *et al* (2001) was used to test for the presence of long-run relationship between the variables.

### 5. Results and Discussion

#### 5.1 Descriptive Statistics Results

Table 2 shows the descriptive statistics results of variables in the regression model. From the results, real GDP (RGDP) had a minimum 1332. The maximum value of this variable was 2550 while the mean and median values were 1787.68 and 1598 respectively. Again, during the period under investigation,

primary school enrolment ratio (PSE) reached the minimum of 78.66%; while it achieved the maximum value of 98.10%. The secondary school enrolment ratio averaged 32.79%, with minimum of 23.55% and maximum of 56.20%. In the 31 years under review, the public sector expenditure on education averaged N120.94 billion naira per year. The highest value during the period was N403 billion naira; while the minimum value was 0.23 billion. The Jacque-Bera (JB) test for the variables showed that the distributions were normally distributed, hence, called for unit root test.

**Table 2: Summary Statistics Results**

	RGDP	PSE	SSE	PEXE
Mean	1787.682	90.84275	32.79325	120.9416
Median	1598.820	92.09114	29.61322	64.78000
Maximum	2550.470	98.1081	56.20540	403.9600
Minimum	1332.796	78.66348	23.55180	0.230000
Std. Dev.	445.0042	6.562884	9.313592	138.8213
Skewness	0.516479	-0.171232	0.793861	0.940930
Kurtosis	1.656182	2.307490	2.443162	2.337413
Jarque-Bera	3.710764	0.770933	3.656616	5.141375
Probability	0.156393	0.680133	0.160685	0.076483
Sum	55418.14	2816.125	1016.591	3749.190
Sum Sq. Dev.	5940863.	1292.143	2602.290	578140.8
Observations	31	31	31	31

**Source:** Authors' Computation (2021)

### 5.2 Unit Root Test Analysis

The unit root test results are presented in Table 3. From the results, the Augmented Dickey Fuller (ADF) statistics shows that RGDP, Secondary school enrolment ratio (SSE) and Public expenditure on education (PEXE) were not stationary at level. However, they became stationary after first differencing. Therefore, they are I (1) series. Primary school enrolment ratio (PSE) is stationary at level; I(0) series. All the variables show sign of unit root at level for the Philips-Peron Test too. These results made us to proceed to conduct the co-integration bound test.

**Table 3 Test for Unit Test and Order of Integration**

VARIABLE	Augmented Dickey-Fuller (ADF)			Phillips- Perron (PP)		
	LEVEL	1ST DIFF.	Order	LEVEL	1ST DIFF.	Order
RGDP	-0.4055	3.0389	I(1)	-0.1739	2.9478	I(1)
PSE	-3.1161	-	I(0)	-2.1492	-4.4772	I(1)
SSE	-0.7472	-6.5469	I(1)	-0.7472	-6.5469	I(1)
PEXE	0.5605	-4.7228	I(1)	1.7792	-4.6474	I(1)

**Source:** Authors' Computation (2021)

### 5.3 ARDL/Bound Co-integration Test Analysis

The essence of conducting the co-integration test was to ascertain whether or not the variables have any long run relationship that can be modeled and estimated. To achieve this task, the ARDL/Bound test to co-integration was employed (See Table 4).

**Table 4: Bounds Testing for Co-integration Results**

Test Statistic Used	Calculated Value	Significance Level	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.204485	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Finite Sample: n=35				
Actual Sample Size	28	10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816
		10%	2.676	3.586
Finite Sample: n=30				
		5%	3.272	4.306
		1%	4.614	5.966

Source: Authors' Computation (2021)

The figures in Table 4 showed the result of ARDL/Bound co-integration test results. From the result, the F-statistic calculated was 4.2044 with probability of 0.05(5%), and for finite sample of 28 (the actual size is 31, differencing removes 3). The empirical F-statistic is greater than any of the upper and lower critical values of 4.194 and 3.164 respectively. Thus, the null hypothesis is rejected. This implies that there is a fixed and stable long run relationship among the variables can be modeled and estimated. The analysis thus proceeded to estimate the long run values of the model parameters.

#### 5.4 Estimated Long run and Short run coefficients using the ARDL method

**Table 5: Estimated Long run coefficients using the ARDL method selected, using the Schwarz Bayesian Approach**

Variable	Coefficient	Std. Error t-	Statistic	Prob
PSE	13.14098	7.778551	1.689387	0.1075
SSE	36.98401	13.46393	2.746897	0.0128
PEXE	0.573959	0.872644	0.657724	0.5186
C	-627.1038	785.8576	-0.797987	0.4347

Source: Authors' Computation (2021)

The long run coefficients in Table 5 show that PSE has positive and not impactful effect on RGDP. Although insignificant, the policy implication is that increase in Primary school enrollment (PSE) ratio will stimulate economic growth in the long run. Furthermore, Secondary school enrollment ratio has a positive and significant relationship to real gross domestic product (RGDP). The policy implication is that an increase in secondary school enrollment ratio has a positive impact on the economic growth of Nigeria during the long term analysis.

Public expenditure on education had positive, but insignificant effect on Real Gross Domestic Product. The policy implication of this result is that in the long run, increase in Public expenditure on education spurred increase in real Gross Domestic Product (RGDP). However, the effect was not significant.

**Table 6: Short Run Coefficients using the ARDL method selected, using the Schwarz Bayesian Approach**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	0.284492	0.131427	2.164648	0.0434
D(PSE(-1))	-4.208936	1.880661	-2.238009	0.0374
D(SSE(-1))	2.544128	1.192311	2.133798	0.0492
D(PEXE(-1))	-3.598020	2.121781	-1.695755	0.1063
CointEq(-1)*	-0.304216	0.060305	-5.044621	0.0001

**Source:** Authors' Computation (2021)

The short run impact of the primary school enrolment ratio on economic growth is shown in Table.6. The figures in the Table 6 reveal that the impact of primary school enrolment ratio on economic growth is negative and significant in the short run. The economic implication of this result is that, an increase in primary school enrolment ratio by 1% will cause economic growth rate to fall by 4.20% after one year lag. Unlike the long run relationship between primary school enrolment ratio and economic growth, this result in the short run does not conform to the a priori expectation stated earlier.

The resultant effect of secondary school enrolment ratio on the economic growth of Nigeria is positive and statistically significant as shown in Table 6. Specifically, an increase in secondary school enrolment ratio by 1% might bring about an increase in the economic growth rate by 2.54% after one-year lag and aligns with a priori expectation.

Public expenditure on education has a negative and does not affect economic growth in the short run. This stems from the fact that an increase in the level of public expenditure on education by 1% will cause a fall in the economic growth rate of Nigeria by 3.6% after one year's lag. The coefficient of the co-integration term is negative and statistically insignificant. The findings of this result implies that something is amiss in the education sector of Nigeria, as investment in education if well utilized ought to foster economic growth and not dampen it. With the result of both findings of PSE and PEXE, it is evident that there is a valid error correction mechanism in the model.

**Table 7: Error Correction Result for the Selected ARDL Model Estimation Using Schwarz Bayesian Method**

Explanatory Variables	Coefficients	Standard Error	t-statistics	Prob
Constant	0.284492	0.131427	2.164648	0.0434
PSE	0.007201	1.795569	0.004010	0.9968
SSE (-1))	-4.208936	1.880661	-2.238009	0.0374
PEXE (-2))	-3.598020	2.121781	-1.695755	0.1063
ECM(t-1)	-0.3042	0.060305	-5.045	0.0001
R-squared	0.624010			
Adjusted R <sup>2</sup>	0.558620			
DW statistics	1.821272			
F- statistics	4.204485			

**Source:** Author's Computation (2021)

Based on the result in Table 7, the coefficient of primary school enrolment is 0.007201 and its value is positive. This means that, every one percent increase in primary school enrolment, will lead to about

₦0.007billion increase in RGDP. Again, the computed t\*statistics of 0.004, is less than the critical t\*value of 2.05. This means that Primary school enrolment does not statistically impact real gross domestic product thus, we accept the null hypothesis which says, there is no significant relationship between Primary school enrolment and real gross domestic product. This suggestion however, is not in agreement with a priori expectation. For instance, Adawo (2011) and Okuneye (2014) unanimously, agreed that Primary school enrolment enhances the economic growth of Nigeria. The policy implication of this finding is that, though primary school enrolment is a catalyst for the economic growth of various economies, the case of Nigeria has not been so. Perhaps this might be attributed to some societal challenges such as; cultural bias against the girl child, high percentage of out of school children, etc. The aforementioned which has continued to widen the educational inequality gap in Nigeria's basic education, might have attributed to the reasons why primary school enrolment has not impacted the economic growth of Nigeria.

Table 7 also has it that the coefficient of public expenditure on education is negative with a value of -3.598020. What this means is that, for every 2 year period, a one percent increase in public expenditure on education in Nigeria, will lead to about ₦3.598020 billion decreases in the real gross domestic product of the country. Again, the computed t\*statistics of -1.695, is negative and less than the critical t\*value of 2.05. This means that public expenditure on education does not statistically impact on real gross domestic product. Thus, we accept the null hypothesis which states, there is no significant relationship between Public expenditure on education and real gross domestic product. This finding is not in agreement with a priori expectation. It is expected that public expenditure on education increases growth. The result of the findings is in tandem to the work of Johnson and Wasiu (2016) and also with Aigbedion (2017). The Policy implication of the result of finding is that, government expenditure over the years have continued to create gap in Nigeria's education system which has been a plague to the economic growth of the country. On the other hand, the coefficient of secondary school enrolment is negative value but statistically significant and does have an impact on the real gross domestic product of Nigeria.. This result is in tandem with a priori expectation and in agreement to the work of Najid (2012) and Ogunleye *et al* (2017). The policy implication of this finding is that, irrespective of the diminishing effect secondary school enrolment rate have on the economic growth of Nigeria; it is still having a substantial influence on the economic growth rate of the country.

### 5.5 Post Estimation Tests

It is important that in empirical analysis after estimation, post estimation test should be carried out in order to ascertain the soundness of the empirical method. Hence, in this study residual normality, serial correlation, heteroscedasticity and model specification test were carried out. The summary of the results are presented in Table 8.

**Table 8: Results of Model Diagnostic Tests**

Test	Techniques	Statistic	Empirical	P-Value	Remarks
Residual Normality	Jacque-Bera	Jacque-Bera	2.0569	0.3575	Accepted
Serial Correlation	Breusch-Godfrey	X <sup>2</sup>	1.5188	0.4679	Accepted
Homoscedasticity	ARCH	X <sup>2</sup>	1.1688	0.5574	Accepted
Model specification	Ramsey RESET	F-statistic	0.7042	0.5083	Accepted

**Source:** Authors' Computation (2021)

The results of the post estimation test are presented in Table 8. The results show that the estimated



residuals from the model parameters are normally distributed. Furthermore, there is no evidence from the serial correlation test to suspect serial correlation among the error terms. The residuals variances over time are constant. This implies that the error terms are homoscedastic, the report of the Ramsey RESET test of model specification shows that the model employed for the analysis was correctly specified. That is, there is no misspecification or specification bias. The implication of the model diagnostic test is that the model was adequately specified, and the estimated error terms are independently and identically distributed (IID) with mean zero ( $\mu = 0$ ) and constant variance. Therefore, standard hypothesis testing techniques can be applied.

Furthermore, stability of the model test was conducted too and the results are in figures 1a and 1b (CUSUM and Recursive Residual graphs). The plotted CUSUM and Recursive Residual graphs plots remained inside the critical bound straight lines. Hence, the null hypothesis of correct specification of the model is accepted. The acceptance of the null hypothesis is premised on the fact that the plots of the blue lines stayed within the critical bound. This implies that the variables are correctly specified and relatively stable over the period and can be used for inferences.

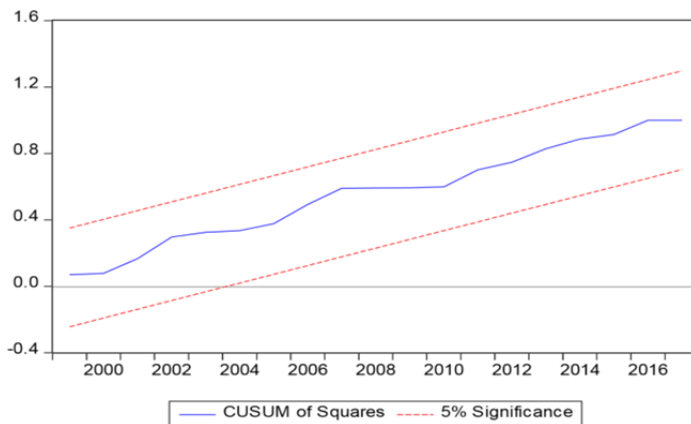


Figure 1a: Stability Test using CUSUM of Square method.

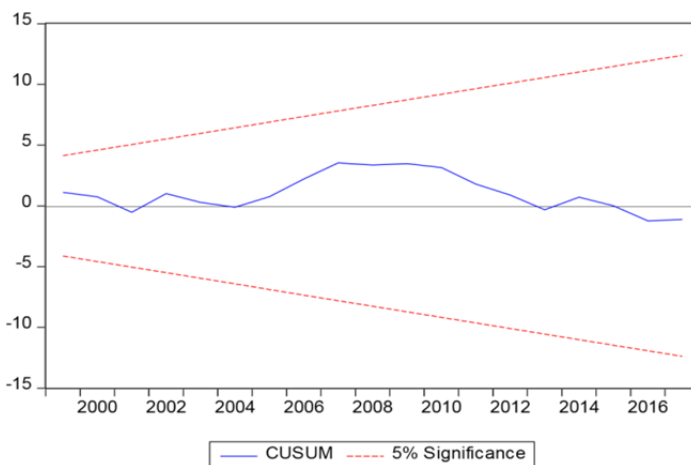


Figure 1b: Stability Test Using CUSUM Method

## 6. Concluding Remarks

The relationship between education and economic growth have gained much relevance in economic literature as many researchers have devoted much time and attention, in investigating the nexus between education and the macroeconomic variables. This paper investigated the effect of primary school enrolment and public education spending on Nigeria's economic growth using the Autoregressive distributed lag model (ARDL). The analyses of the result also showed that primary school enrolment rate and public expenditure on education increased but their effects were less impactful on Nigeria's economic growth. These findings perhaps could be attributed to the poor state of classrooms, poor teacher-pupil ratio, unstable macroeconomic environment, dearth of instructional materials and more. Based on the outcomes of the analyses, the study concludes that although Primary school enrolment is a catalyst to enhance economic growth, its effect on the economic growth of Nigeria remains insignificant. The paper thus recommend that there should be urgent re-design of educational strategies by the government to include enrolment campaigns, alternative learning programs, pro-poor economic incentive and more, especially at the basic education level and also increased her budgetary allocation to education sector in line with UNESCO recommendation of about 26 percent

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