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EFFECTS OF MORBIDITY, POPULATION GROWTH AND EDUCATION ENROLMENT ON ECONOMIC GROWTH IN NIGERIA

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Abstract
The main thrust of this paper is to investigate the effects of morbidity, population growth and education enrolment on economic growth in Nigeria, using data for the period of 1981-2019. The basic macroeconomic variables adopted are real gross domestic product (RGDP), Education enrolment (EDUR), Total Federal government expenditure on Education (EEXP), Stock of Physical Capital (GCF), and Inflation rate (INF). The paper applied Granger Causality test to identify the relationship between the variables and ARDL model. The empirical results indicated that, there is a unidirectional causality running from each of education expenditure, school enrolment and gross capital formation to economic growth (RGDP). Population growth and education enrolment recorded the highest impact on economic growth during the period reviewed. A year lag of education enrolment poses positive impact on economic growth. The entire variable significantly affects economic growth. The policy implication and suggestion is that greater resources should be committed to education and health sectors in view of the fact that a healthy and well-educated labour force is a prerequisite for the attainment of economic growth.

Keywords: *Morbidity, Population growth, Education Enrolment, Economic Growth, Inflation.*

Introduction

The notion of health as a component of human capital was introduced in the early 1960s. However, a large body of both theoretical and empirical literature has affirmed a positive impact of human capital accumulation in the form of health on economic growth. For example, Strauss and Thomas (1998); Rivera and Currais (1999a, 1999b, 2004); Heshmati (2001), Dritsakis (2005); and Hartwig (2008), among others agreed that health is also a major form of human capital and there exists substantial agreement in the literature on the relationship between health and economic development through its relationship between capability and poverty. It is assumed that improvement in health leads to improvement in life expectancy, which is a robust indicator of human development. A simple channel through which health affects human development is by improving living conditions.

In addition, the growth-enhancing role of education enrolments becomes an increasingly recognized issue in contemporary economics literature. For instance, on the empirical front, studies such as Kanayo and Adenuga (2005),and, Anyanwu and Erhijakpor (2005), who conducted similar research on Nigeria revealed that investment in human capital in the form of enrolment rates at the primary, secondary and tertiary levels of education has impacts on the economic growth in Nigeria.

In relation to the above, Olaniyan and Bankole (2005) opined that the definition of health as a form of human capital is however fraught with controversy in the literature. However, for long, researchers have focused their attention on the educational dimension of human capital, yet it has been known that human capital can also be accumulated by improving the health status of the population (Schultz, 1961).
Furthermore, Moore, Newman and Fheili (1992) in Hodo and Emmanuel (2010) specified a supply model for cross-country examination where per capita health care expenditure is a function of per capita income, per capita number of physicians, nurses and beds the ratio of public expenditure to total health care expenditure as well as trend. Their result indicated that the number of per capita beds has a negative effect on health care spending.

In the same vein, Abul Kalam and Aziz (2009) used Johansen's cointegration test and Granger Causality test; the results provided evidence in favour of the Wagner's law for Bangladesh for the period 1976-2007. The study revealed a long-run cointegration relation among real government expenditure, real GDP and the size of population. Also, Ghorbani and Firooz (2009) examined Wagner's law using Engle and Granger-ECM; the results showed that real income elasticity for non- proportional versions were bigger than one and for proprotional ones were bigger than zero. Tracing the same line of analysis, Abdullahi and Maamor (2010) examined Wagner's law validity in Malaysian economy by using the Autoregressive Distributed Lag model (ARDL) and the border test (bound test) introduced by Pesaran, Shin and Smith (2001). The study revealed that long-run relationship exists between national products and government development expenditure. That is, the national product factor is still relevant in influencing government development expenditure in Malaysia.

On the contrary, Ansari, Gordon and Akuamoah (1997) found no evidence supporting Wagner's law. For three African countries, Kenya, Ghana, and South Africa, using standard Granger testing and the Holmes-Hutton causality test for the period 1957-1990, the study revealed that there is no long run relationship between the two variables in the three countries, and also found no evidence supporting Wagner's law, except for Ghana where Wagner's is confirmed. Similarly, Chow, Cotsomitis and Kwan (2002) using Johansen technique and UK data for the period 1948-1997 pointed out that omitted variables may block or overstate the linkages between government expenditures and economic growth. The result of the study revealed that no evidence to support Wagner's law until they include the money supply, to obtain undirectional causality from income to government expenditure. Related to this is the study conducted by Frimpong and Oteng-Abyia (2009) testing the linkages between public expenditures and economic growth in Gambia, Ghana and Nigeria for the period 1966-2004 using cointegration and Granger causality tests to confirm Wagner's law. Their study revealed that the national income factor is not relevant in influencng government development expenditure in the selected countries during the period under review therefore negating Wagner's law.

The main objective of this paper is to investigate the causal relationship between morbidity, population growth and education enrolment on economic growth in Nigeria. As a result, the study adopted endogenous growth model as modified by Mankiw, Romer and Weil (1992) through the application of ARDL model and Granger Causality test to achieve the stated objective. The conclusion and recommendations were drawn from the ARDL model and Granger Causality testresults. However, the remaining sections of the paper are structured as follows: Section 2 dwells on review of related literature on the link between morbidity, population growth, education enrolment and economic growth. Section 3 explains the research methodology and model specification, Section 4 discusses the Granger Causality test results while Section 5 gives conclusion and policy implication.

Review of Related Literature

Conceptual Issues on the link between education enrolment and economic growth in Nigeria

The bulk of both theoretical and empirical literature did not acknowledge issues relating to education enrolment and economic growth before 1960. For instance,Bratti, Morretti and Morretti (2004), found that increase in primary and secondary level of education contributes to an increase in productivity. They found that human capital accumulation rate is affected by demographic variables. In a related study, Kanayo and Adenuga (2005)model,made use of narrow flow measures of human capital such as: the enrolment rates at the primary, secondary and tertiary levels and capital expenditure on education, recurrent expenditure on education as variables capturing humancapital. Their model revealed that investment in human capital in the form of education and capacity building in the form of training has impact on economic growth in Nigeria. However, their result is in agreement with that of Anyanwu and Erhijakpor (2005), who

conducted similar research for Nigeria. In addition, the findings of Kanayo and Adenuga (2005),are consistent with that of Mincer (1974), who reported that the quality and structure of education matters, on its impact on growth.

In the work of Atoyebi, Olaleye, Ishola, Adekunjo and Kadiri (2013) which studied the relative effect of physical formation on economic output in Nigeria using multiple regression analysis technique and cointegration regression analysis. The findings of the study showed that, there is a strong evidence cointegration between RGDP and Human Development Indices. He added that high level of human capital development has increased the utilization of resources, both human and material.

Furthermore, it was established in literature by some authors (e.g. Sarel, 1996; Khan &Senhadji, 2001; Drukker, Gomis-Porqueras& Hernandez-Verme, 2005;Doguwa, 2009; andChimobi, 2010) that there is a link between inflation and economic growth. For example,Chimobi (2010),investigated the existence of a relationship between inflation and economic growth using annual Nigerian data for the period of1970 – 2005. The study found no co-integrating relationship between the two variables. Using Granger causality test however, the study established unidirectional causality running from inflation to economic growth. In addition, the studies on the nonlinear relationship between inflation and economic growth argued that at low inflation levels, the relationship between inflation and economic growth is non-existent or positive while at higher levels of inflation, the relationship becomes significant and negative.

On an equal note, Doguwa (2009), examined the issue of the existence and the level of inflation threshold in the relationship between inflation and growth in Nigeria. He used Sarel (1996)'s, Khan and Senhadji (2001)'s, and Drukker, Gomis-Porqueras, and Hernandez-Verme (2005)'s, approaches that provide appropriate procedures for estimating the threshold level and inference. The results obtained suggested that the threshold level of inflation inimical to growth is estimated at 10.5 to 12 per cent for Nigeria. Using the estimated two threshold point model, his study did not find enough reasons to accept the null hypothesis of the super-neutrality of money, and therefore, suggested that there is a threshold level of inflation where money is not super-neutral. This present study is, however, consistent with their results and other researchers' such as Mincer (1974), Temple (1999) and Atoyebi, Olaleye, Ishola, Adekunjo and Kadiri (2013), on the relationship between human capital (level of education) and economic growth in Nigeria.

Methodology and Model Specification

Specification of Model

The paper applied ARDL model and Granger Causality test to examine the impact of morbidity, population growth and education enrolment on economic growth. The E-views computer package (version 9.0) was used for estimations.The model specification is based on economic theories such as Barro (1991) and Mankiw, Romer and Weil (1992). The model is specified as follows:

$$logRGDP_i = \beta_0 + \beta_1 logEDUR_t + \beta_2 logEEXP_t + \beta_3 logGCF_t + \beta_4 MBDT_t + \beta_5 INFR_t + \beta_6 POPg_t + \mu_t$$

Where,
RGDP = Growth rate of real gross domestic product (i.e. dependent variable)

o = constant parameter

EDUR = Education enrolment (proxy by secondary school enrolment)
EEXP = Total Federal Government Expenditure on Education (summation of recurrent and capital)
GCF = Stock of Physical Capital (proxied by gross capital formation)
MBDT = Morbidity rate in Nigeria (proxied by prevalence of malaria as % of the population)
INF = Inflation rate as indicated by the country's GDP deflator

POPG = Percentage of population growth

Intuitively, the EDUR, EEXP, GCF, POPG are expected to have positive relationship with economic growth.

Empirical Analysis
Graphical presentation
The data obtained from World Development Indicators (WDI) for the purpose of this study are presented graphically to examine the trend in each of the variables of this study. Figure 1 shows that real GDP of Nigeria has been moving in an upward trend since the beginning of the period, although, the rate of increase fell towards the end of the period, reflecting the recession witnessed in the country during that time. Expenditure on education has also been moving upward from the start of this period but fell toward the end of the period, almost around the same time the country experienced fall in GDP. Education enrolment, inflation and gross capital formation have been unstable, exhibiting periods of rise and fall in values. However, they have been shown to have been falling towards the end of the period. Morbidity is seen to have been rising at a point during the period, but reached its peak in 2003 and started to fall continuously till the end of the period.

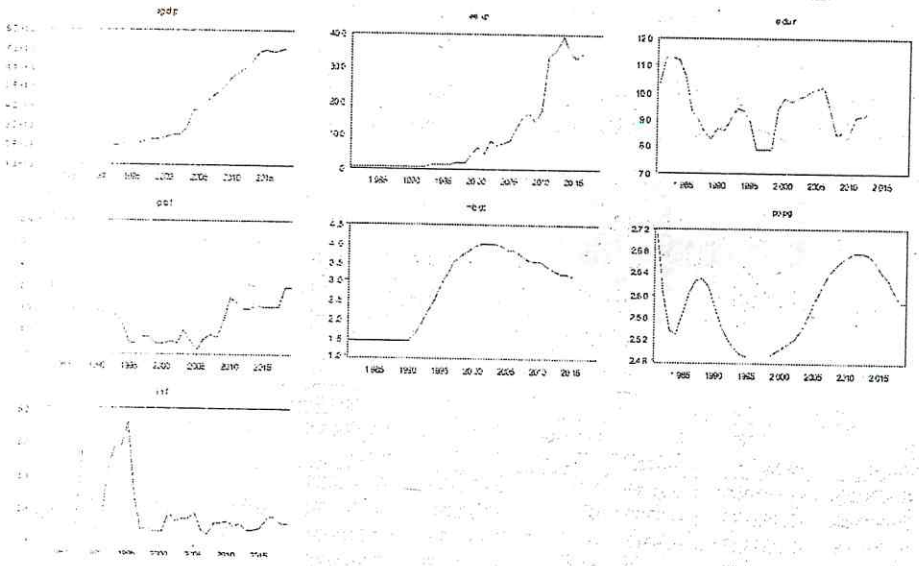


Figure 1: Graphical Presentation of Variables

Correlation Analysis

Table 1 depicts the relationship among the variables of the model. Education expenditure (EEXP), Education enrolment (EDUR), Gross capital formation (GCF) and real gross domestic product (RGDP) have positive correlation with all the variables except inflation rate (INF). INF recorded negative correlation with all the variables, and on average has the lowest correlation with all the variables. Morbidity rate (MBDT) recorded negative correlation with Population growth (POPG); and both recorded positive correlation with every other variables. EEXP and EDUR recorded the highest correlation (0.94), next to it is EEXP and GCF (0.85), while EDUEXP and RGDP recorded positive correlation of 0.79. The lowest correlation was recorded by MBDT and POPG (0.12), MBDT and RGDP (0.13).

Table 1: Pairwise Correlation Matrix

	EEXP	EDUR	GCF	INF	MBDT	POPG	RGDP
EEXP	1.000000						
EDUR	0.739851	1.000000					
GCF	0.652516	0.695468	1.000000				
INF	-0.348753	-0.359576	-0.352963	1.000000			
MBDT	0.425304	0.562765	0.146111	-0.205122	1.000000		
POPG	0.577068	0.542193	0.743002	-0.313610	-0.120456	1.000000	
RGDP	0.795363	0.672749	0.701114	-0.185654	0.127940	0.360965	1.000000

Source: Authors' Computations (2020) from E-views (Version 9.0)

Pre-estimation Test

It is important to understand the behavior of the variables in term of stationary and long run relation, because it is the core determinants of the estimation techniques. Thus, the study conducted unit root and cointegration tests.

Unit Root Test

The results from Augmented Dickey Fuller and Phillip Perron tests (in Table 2) show that all the series are stationary after first difference at 5 percent significant level except population growth (POPG) which is stationary at level with ADF test.

Table 2: Unit Root Test

	Augmented Dickey Fuller Test				Phillip Perron Test			
Variables	ADF Statistic	5% Critical Value	P-Value	Remark	PP Statistic	5% Critical Value	P-Value	Remark
LOGEEXP	-0.878195	-1.948404	0.7833	NS	-0.631331	-2.948404	0.8507	NS
D(LOGEEXP)	-7.090691	-2.951125	0.0000	I(1)	-12.57860	-2.951125	0.0000	I(1)
LOGEDUR	-0.382665	-2.951125	0.9012	NS	-1.139225	-2.948404	0.6890	NS
D(LOGEDUR)	-4.122079	-2.951125	0.0029	I(1)	-4.177602	-2.951125	0.0025	I(1)
LOGGCF	-0.471569	-2.957110	0.8842	NS	-1.230388	-2.948404	0.6501	NS
D(LOGGCF)	-3.878828	-2.957110	0.0057	I(1)	-4.624329	-2.951125	0.0007	I(1)
LOGRGDP	-0.564761	-2.948404	0.8659	NS	-0.335866	-2.948404	0.9093	NS
D(LOGRGDP)	-7.552968	-2.951125	0.0000	I(1)	-7.552968	-2.951125	0.0000	I(1)
MBDT	-2.144806	-2.951125	0.2293	NS	-1.938023	-2.948404	0.3118	NS
D(MBDT)	-4.141247	-2.951125	0.0027	I(1)	-4.338163	-2.951125	0.0016	I(1)
POPG	-4.537404	-2.976263	0.0013	I(0)	-2.331937	-2.948404	0.1681	NS
D(POPG)					-4.364650	-2.951125	0.0015	I(1)
INF	-2.816479	-2.948404	0.0662	NS	-2.689943	-2.948404	0.0859	NS
D(INF)	-5.416306	-2.951125	0.0001	I(1)	-9.063364	-2.951125	0.0000	I(1)

Source: Authors' Computations (2020) from E-views (Version 9.0)

Cointegration Test: Model ARDL Bound Test

According to Pesaran et al., (2001) ARDL bound test is most suitable for testing for long-run relationship among the variables when the series are all I(1) or combination of I(1) and I(0). Phillip Perron test in Table 2 shows that all the series in this study are stationary after first difference, while Augmented Dickey Fuller showed that the series are combination of I(1) and I(0). Therefore, the use of ARDL Bound test for long run relationship among the variables is suitable.

The existence of a long run relationship among the variables in the estimated model is investigated using F-statistics with two sets of critical values, that is I(1) and I(0) as argued by Pesaran et al. (2001). If the estimated F-statistic is greater than the upper bound critical values (that is I(1) bound value) at 5% significance level, the null hypothesis of absent of long run equilibrium relationship between investment and its explanatory variables will be rejected. If the estimated F-statistic is below the lower bound critical value (that is I(0) bound value), the null hypothesis cannot be rejected at 5% significance level. Also, if the estimated F-statistic falls within upper and lower bound critical values, the test is regarded to be inconclusive.

The result of ARDL Bound Test in Table 3 shows that the null hypothesis of no long run relationship at 5% significance level is rejected because the value of F-statistic (4.5) is greater than I(1) upper bound value (3.6) . Therefore, it can be concluded that there exists a long run relationship between RGDP and its explanatory variables as modeled in the study.

Table 3: ARDL Bounds Test Approach

Test Statistic	Value	K
F-statistic	5.913718	6
	Critical Value Bounds	
Significance	I(0) Bound	I(1) Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Authors' Computations (2020) from E-views (Version 9.0)

Discussion of Estimated ARDL Model Result

The adjusted R^2 (0.882168) implies 88% strong predictive power of the model. The values of the Schwartz information criterion (SIC), Hannan-Quinn criterion (HQ) and Akaike info criterion (AIC) for the estimated first 20 ARDL models are presented in Table 4. Thus, it gives a clear justification that the model with the least SIC is chosen given the maximum lag selected. The lag error correction term CointEq(-1), which measures the speed of adjustment to restore long-run equilibrium in the dynamic model has the expected negative sign, less than one andwith a coefficient value of 83%. It is statistically significant at 1% significance level. It shows that the long-run equilibrium relationship between RGDP and its explanatory variables is attainable.The P-value of F-statistics (0.0000) shows that the model is fit.

The expected sign of population growth is debatable because country below optimum population might record economic growth as the population grows, whereas country above the optimum population might record negative economic growth with growth in her population. Population growth is the only variable that was significant at 1% in the short run. One year lag of education enrolment was significant; this implies that increase in the number of school enrolment takes a year before it reflects on economic growth and its effect is negative.

Table 4: Short run Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGEEXP)	0.312210	0.272241	1.146814	0.1646
D(LOGEDUR)	5.532158	3.874930	1.427679	0.2004
D(LOGEDUR(-1))	-7.693446	3.104914	-2.477829	0.0001
D(LOGGCF)	-0.523491	0.753247	-0.694979	0.6075
D(MBDT)	-0.403285	0.882467	-0.456997	0.6243
D(POPG)	-33.981171	15.238901	-2.229896	0.0079
D(INF)	0.006430	0.021432	0.300019	0.5130
CointEq(-1)	-0.832017	0.240784	-3.455450	0.0000
R-squared	0.916747	Akaike info criterion		2.411789
Adjusted R-squared	0.882168	Schwarz criterion		3.092020
Log likelihood	-25.48594	Hannan-Quinn criter.		2.640666
F-statistic	20.14320	Durbin-Watson stat		2.021774
Prob.(F-statistic)	0.000000			

Source: Authors' Computations (2020) from E-views (Version 9.0)

In the long run estimates of the model, all the variables were significant at 5%. Real gross domestic product, expenditure on education, school enrolment and gross capital formation were logged. Specifically, 1% rise in total Federal government expenditure on education increases economic growth by 0.99%. Total education enrolment proxied by total secondary school enrolment, was found significant; 1% increase in secondary school enrolment in Nigeria increases economic growth by 8.0%.

Gross capital formation was found to be negatively significant; additional 1% increase in gross capital formation reduces economic growth by 2.01%. Perhaps, this could be attributed to high level of corruption in Nigeria, as huge part of capital formation has been invested in personal private residence and not necessarily on infrastructures like roads, industrial machinery, and equipment.

Morbidity, population growth, and inflation rate were not logged because they are in percentage form. They were all negatively significant at 5%. A percentage point rise in morbidity rate and population growth in Nigeria reduces economic growth by 2.7% and 20.1% respectively. The negative impact of population growth could be attributed to the rise in the accumulated unemployed labor force over the years in Nigeria. Inflation was found to be negatively significant; 1% rise in inflationary level reduces economic growth by 0.03%.

Table 5: Long run Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEEXP	0.991219	0.437041	2.268023	0.0311
LOGEDUR	8.012804	3.000259	2.670704	0.0143
LOGGCF	-2.015647	0.885671	-2.275841	0.0456
MBDT	-2.691239	0.612091	-4.396795	0.0000
POPG	-20.15237	5.987255	-3.365878	0.0005
INF	-0.025789	0.010233	-2.520179	0.0199
C	-7.149082	10.30522	-0.693734	0.8790

Source: Authors' Computations (2020) from E-views (Version 9.0)

Tables 6 and 7 depict the residual test to show the validity and robustness of the results from the estimated model. The probability values from Breusch-Godfrey serial correlation test and Breusch-Pagan-Godfrey heteroscedasticity test were greater than 5%. Therefore, the null hypotheses of absence of serial correlation and heteroscedasticity were not rejected.

Table 6: Serial Correlation LM Test

	Breusch-Godfrey		
F-statistic	1.540211	Prob. F(2,17)	0.2011
Obs*R-squared	3.081980	Prob. Chi-Square(2)	0.1572

Source: Authors' Computations (2020) from E-views (Version 9.0)

Table 7: Heteroscedasticity Test

	Breusch-Pagan-Godfrey		
F-statistic	1.645710	Prob. F(17,15)	0.1989
Obs*R-squared	6.157311	Prob. Chi-Square(17)	0.1703
Scaled explained SS	7.312331	Prob. Chi-Square(17)	0.9001

Source: Authors' Computations (2020) from E-views (Version 9.0)

Pairwise Granger Causality Test

The result of the Pair-wise Granger Causality Test as shown in Table 8 indicates the causality or the direction of influence between RGDP and each explanatory variable. The decision whether to reject or accept the null hypothesis is made based on the probability of the F-statistics.

Table 8: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
RGDP does not Granger Cause EEXP	34	1.21459	0.1201
EEXP does not Granger Cause RGDP		15.6021	0.0000
RGDP does not Granger Cause EDUR	34	0.00172	0.9112
EDUR does not Granger Cause RGDP		4.32801	0.0072
RGDP does not Granger Cause GCF	34	0.02321	0.9917
GCF does not Granger Cause RGDP		3.40273	0.0098
RGDP does not Granger Cause INF	34	0.11492	0.9001
INF does not Granger Cause RGDP		0.31390	0.7714
RGDP does not Granger Cause MBDT	34	0.49232	0.6099
MBDT does not Granger Cause RGDP		0.57302	0.5021
RGDP does not Granger Cause POPG	34	0.51240	0.5138
POPG does not Granger Cause RGDP		1.114601	0.2031

Source: Authors' Computations (2020) from E-views (Version 9.0)

The result of the causality test shows that expenditure on education, school enrolment and gross capital formation has uni-directional causal relationship with Real GDP; flowing from each of the former variables. All other explanatory variables show neutral causality relationship with real GDP.

Policy Implication

In Summary, this study examined the effect of morbidity, population growth and education enrolment on economic growth in Nigeria, covering the period of 1981 to 2019. Following the pre-estimation test, the study employed pairwise correlation, ARDL model and granger causality to achieve the stated objectives. The correlation result shows that school enrolment and total government expenditure on education and gross capital formation have high and positive correlation with economic growth. Population growth and morbidity showed positive and low correlation, while inflation rate was the only variable with negative correlation. In the ARDL results, all the variables were significant at the long run and conformed to expected signs except gross capital formation. School enrolment shows the highest significant positive impact on economic growth, next to it is government expenditure on education. Morbidity shows the highest significant negative impact on economic growth, next to it is population growth.

As a policy implication, the weight of population growth on economic growth is not a surprise, population growth is detrimental to the performance of the economy because in the past two decades unemployment rate in Nigeria has raised huge source of concern to both policy makers and international community. Thus, the population growth has become more of disadvantage than blessing to Nigerian economy. The study showed that rise in the trend of morbidity (proxy by prevalence of malaria) affects the quality of human capital, which is necessary for economic development. The positive impact of government expenditure on economic growth is unjustified looking at the decline in the trend of fiscal budget on education as a percent to aggregate budget. This has been accompanied by sharp drop in the quality of education at both public primary and secondary schools.

Overall, these resultsare supported by some empirical studies such as: Adawo (2011), Bratti, Morretti and Morretti (2004), Kanayo and Adenuga (2005) and Anyanwu and Erhijakpor (2005) among others, that asserted that high level of education enrolment holds the key to the nation's economic growth.

Conclusion and Recommendations

Conclusively, this paper recognizes that in addittion to the efforts and challenges of government and other stakeholders in education, which have raised the level of economic performance of Nigeria, the increased educational enrolment has also improved the level of human capital and consequently increased economic performance. The prevalence of malaria, on its part, has continued to undermine economic wellbeing of the country, alongside the worrisome level of inflation. A pragmatic public educational expenditure development plan that is well funded with a proactive monitoring mechanism in line with the needs of the economy, coupled with an application of international standard in the tackling of prevailence of morbidity is important to improve the nation's economic growth.

From the foregoing, the findings of this research work provide basis for the following recommendations:

The government should devote more fund to the educational sector to improve the quality of education so to make the country's manpower relevant in the highly competitive and globalized economy.

Also, Nigerian policy makers should pay more attention to a productive sector like education and increase yearly,the budgetary allocation to this sector as well as putting up an effective mechanism that will be used to monitor the efficient implementation of budgetary allocations to this sector of the economy.

The federal government, through the ministry of health in collaboration with World Health Organization, should put an effective pragmatic approach in place in fighting incidence of malaria. Federal government should put mechanism in place in order to create an investment friendly enviornment especially in terms of security of lives and

properties, so as to attract both private domestic and foreign direct investments. This will strenthen the population advantage towards economic growth via employment generation.

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Appendix I

Model Selection Criteria Table

Dependent Variable: LOGRGDP

Date: 07/27/18 Time: 21:10

Sample: 1981 2016

Included observations: 34

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
1742	-25.485941	2.411789	3.012020	2.610666	0.876848	ARDL(1, 1, 2, 1, 1, 1, 1)
1985	-25.912923	2.418965	3.053847	2.632584	0.875147	ARDL(1, 0, 2, 1, 1, 1, 1)
284	-23.228519	2.438092	3.209020	2.697486	0.873999	ARDL(3, 1, 2, 1, 1, 1, 1)
1499	-24.238492	2.438697	3.164276	2.682832	0.873925	ARDL(1, 2, 2, 1, 1, 1, 1)
281	-22.431833	2.450414	3.266691	2.725066	0.871934	ARDL(3, 1, 2, 1, 1, 2, 1)
1715	-24.432771	2.450471	3.176050	2.694606	0.872432	ARDL(1, 1, 2, 2, 1, 1, 1)
38	-21.503718	2.454771	3.316396	2.744682	0.870291	ARDL(3, 2, 2, 1, 1, 2, 1)
527	-24.554378	2.457841	3.183421	2.701976	0.871488	ARDL(3, 0, 2, 1, 1, 1, 1)
1733	-24.570454	2.458815	3.184395	2.702951	0.871363	ARDL(1, 1, 2, 1, 2, 1, 1)
1958	-25.622138	2.461948	3.142178	2.690825	0.870513	ARDL(1, 0, 2, 2, 1, 1, 1)
41	-22.647825	2.463505	3.279781	2.738157	0.870246	ARDL(3, 2, 2, 1, 1, 1, 1)
1013	-24.684249	2.465712	3.191291	2.709847	0.870472	ARDL(2, 1, 2, 1, 1, 1, 1)
275	-22.688761	2.465986	3.282262	2.740638	0.869924	ARDL(3, 1, 2, 1, 2, 1, 1)
1739	-24.723965	2.468119	3.193699	2.712254	0.870160	ARDL(1, 1, 2, 1, 1, 2, 1)
2012	-27.737225	2.468923	3.058456	2.667283	0.867524	ARDL(1, 0, 2, 0, 1, 1, 1)
1984	-25.765235	2.470620	3.150851	2.699497	0.869386	ARDL(1, 0, 2, 1, 1, 1, 2)
1741	-24.773513	2.471122	3.196701	2.715257	0.869770	ARDL(1, 1, 2, 1, 1, 1, 2)
1256	-25.841612	2.475249	3.155480	2.704126	0.868780	ARDL(2, 0, 2, 1, 1, 1, 1)
37	-20.903167	2.478980	3.385954	2.784149	0.865307	ARDL(3, 2, 2, 1, 1, 2, 2)
1976	-25.910603	2.479430	3.159661	2.708307	0.868230	ARDL(1, 0, 2, 1, 2, 1, 1)