Impact of Human Capital Formation and Fertility Rate on Economic Growth in Nigeria

BY

Adejuwon Adebisi GBENGA
Relationship Manager, Wema Bank Plc, Nigeria

&

Bello Wasiu OLUWASEUN
Department of Economics, University of Lagos, Lagos, Nigeria

ABSTRACT

It was observed that studies that investigate the effect of human capital formation and fertility rate on economic growth in Nigeria were scanty. This study was therefore set out to examine the impact of human capital formation and fertility rate on economic growth in Nigeria. For the analysis of the data, the study adopted data from 1986 and 2018. The study also made use of an ARDL bounds for the long run estimation of data. The result of the study has shown that total fertility rate has a positive significant relationship with the output growth in Nigeria. The findings have also shown that government expenditure on education has a positive significant impact on the economic growth in Nigeria. One of the recommendations was that government should provide the social and economic framework in order to cater for the increasing population which is as a result of a high fertility rate.

KEYWORDS: Human Capital, Fertility Rate, Life Expectancy, ARDL JEL Classification: B22, E62, H51, H53

Introduction

The significance of human capital development in the achievement of meaningful and sustainable growth and development in any modern economy cannot be overemphasized (Amassoma & Nwosa, 2018). This is because human capital development plays a significant role in the achievement of socioeconomic objectives of an economy. For an economy to fully explore its natural resources and the sustainability of a long-term growth largely depends on human capital development which is the technical expertise of the human resources (Todaro and Smith, 2011, cited in Ozekhome, 2017). The work of Aigbokhan, Imahe and Ailemen (2017) reiterated that human capital seen as an agent capable of facilitating the achievement of growth and development in the world economy; through the provision of education and health services to the people and also one of the major ways of improving the quality of human resources.

The development of human capital can be achieved through the process of human empowerment since it is expected to facilitate active participation and from that perspective may be seen as a facilitator of economic growth and development. Quite a number of developed countries according to International Bank for Reconstruction and Development and World Health Organization have employed their human capital to achieve significant progress in terms of level of productivity and technological advancement (Ogunleye et al., 2016). Many developing countries including those of Sub Saharan Africa and West African, Nigeria inclusive are yet to reach their maximum capacity in spending on the component of human capital in boosting their economic growth. The challenges of human capital

development in the developing countries cannot be separated from the failure of the government in the country to allocate sufficient funds to the course of developing human capital as the underfunding in these important sectors has largely contributed to poor state of educational facilities and health (Ragan & Lipsey, 2005). A population growth compared to the available resources is also a challenge in the developing countries. A high fertility rate contributes to large family sizes or a higher population growth. Generally, in the African context, to limit the family size is a selfish act of individuals unwilling to make personal sacrifices for the good of the larger society. This is why an African couple cherishes having more than one child even when they lack resources to cater for their upkeep as this is common in the Northern area of Nigeria (Oladeji, 2015). The fertility rate in the North is high and this is evident in the fact that Kano, a state in North is the most populated state in Nigeria according to the last population census.

Lack of human capital development has been and is still a burning issue (economically and socially) in Nigeria. As one of Africa's biggest economies, Nigeria has been faced with the problem of human capital development over the years. In spite of all the abundant resources the Nation has been endowed with, Nigeria has failed to realize her full development potential in terms of sustainable human capital development or people-oriented development like many other prosperous economies of the world that have adopted a similar strategy to boost their economic growth. A large percentage of Nigeria's population estimated to be 182.2 million according to World Bank, (2016) remain at rather low levels of literacy and often with insufficient access to education and health care. For instance, the federal government has earmarked N620.5bn for education in the 2019 budget. This amount, which is N14.7bn more than the government's expenditure on education in the 2018 budget which was N605.8bn, is still below the 20 percent minimum recommended for developing countries by the United Nations Educational Scientific and Cultural Organisation (Youdeowei, 2019).

This study improves on the existing studies by incorporating the role of fertility rate in the course of examining the impact of human capital on the economic growth in Nigeria. The broad objective of this study is to investigate the effect of human capital formation and fertility rate on economic growth in Nigeria. Specifically, the study investigates the long run effect of human capital investment and effect of fertility rate on the growth of the Nigerian economy. The study also investigates the dynamic relationship among education, health, fertility rate and economic growth. The study also assesses the interaction of education, fertility rate and economic growth rate in Nigeria.

Literature Review

Human Capital Theory

How education leads to increase in productivity and efficiency of workers through increment in their cognitive skills has been the focal point of this theory. Theodore, Schultz, Gory Bucker and Jacob Mincer introduced the notion that people invest in education so as to increase their stock of human capabilities which can be formed by combining innate abilities with investment in human beings (Niaz, 2018). Examples of such investments include education expenditure, on-the-job training, investment on health and nutrition. However, the stock of human capital increases in a period only when gross investment exceeds depreciation with the passage of time, with intense use or lack of use. In the area of human capital, educational provision is seen as human capital investment, which is such an investment the proponents of human capital theory seen as more worthwhile than physical capital

investment. Human capital theorists have put forward that basic literacy makes workers more productive in low skill occupations.

Endogenous Growth Theory

The endogenous growth theory provided a fresh view on what engineers' contributions to economic growth. It states that a persistent rate of prosperity is influenced by internal processes such as human capital, innovation**,** and investment capital, rather than external, uncontrollable forces, challenging the view of neoclassical economics. Endogenous growth theory, according to Van (2008) has stimulated economists' interest in the empirical evidence available from cross country comparisons, bearing on the main level relationship between human capital development and economic growth. Given that physical capital is attached with diminishing returns, the necessary assumption for the model to exhibit a positive growth rate of output per worker in the steady state is that the technology for generating human capital has constant returns; meaning that the growth of human capital is assumed to be the same for a given effort, regardless of the attained level of human capital. With the assumption, the output growth rate (per worker) is positive and increasing in the education productivity or on the job training in the creation of human capital.

Human Capital and Economic Growth

Adeyemi and Ogunsola (2016) examined the impact of human capital development on economic growth in Nigeria using time series data spanning from 1980-2013 of secondary school enrolment, life expectancy rate, government expenditure on education, gross capital formation and economic growth. Adeyemi and Ogunsola (2016) adopted the ARDL cointegration approach in their study and their study revealed a positive long-run relationship among secondary school enrolment, life expectancy rate, government expenditure on education, gross capital formation and economic growth.

Olalekan (2014) adopted Generalized Method of Moment (GMM) techniques in the analysis and the estimated results provided evidence of positive relationship between human capital and economic growth in Nigeria. His finding is also in conformity to the a priori expectation where human capital is expected to have a positive relationship with the economic growth.

Fertility rate and economic growth

Adediran (2012), Kirdina (2018) found similar results with that of Gideon et al, (2013) where the effect of population on economic development were examined. The studies used trend analysis with the scope spanning between 1981 and 2010 for Adediran (2012) and Gideon et al, (2013) while the data scope for Kirdina (2018) ranges from 1986 to 2017. The three studies adopted ordinary least square method (OLS) of analysis. This method is considered appropriate as the data of the study are stationary at levels and the choice might have also been informed by the simplicity of the method. The result of the study has revealed that population growth has positive and significant impact on economic sustainability represented as real gross domestic product (RGDP) and Per Capita Income.

Fertility, Human capital and Economic Growth

Studies on the relationship among fertility, human capital and economic growth in Nigeria can be said to be scanty as the few available ones are below. Ronald and Andrew (2008) investigated the relationship among fertility, human capital, and economic Growth. The study is based on an overlapping generations (OLG) model and Simulation analysis which highlights the quantity–quality tradeoff and the links between human capital investment and

economic growth. The findings of the study show that population aging leads to an increased demand for wealth that can, under some conditions, lead to increased capital per worker and higher per capita consumption. The result of the simulation analysis shows that, even in the absence of the capital dilution effect, low fertility leads to higher per capita consumption through human capital accumulation, given plausible model parameters. I quite agree with the findings of this study given that an increase in population aging leads to increased demands for goods and services as this also increases tax payment.

Sebnem, Harl and David (2000) examined the role of increased life expectancy in raising human capital investment during the process of economic growth. The study used overlapping generation's model (OLG). The overlapping generation's model is a simplified theoretical representation of complicated economic processes through a set of identities and equations that describe the behavior of various agents interacting with each other. The most distinguishing feature of an OLG model lies in the way it captures the changing behavior of consumers over different phases of their lives. So, adopting this model for the study of this nature can be considered appropriate.

Implication of review on the current study/Gap of the study

To the best of my knowledge and following the review of existing literature, it was observed that studies on the relationship between human capital and economic growth with consideration for the role fertility plays are scanty. For instance, the study by Adelowokan (2012) examined the effect of education and health spending on economic growth in Nigeria with the year ranging from 1970 to 2010. This study also neglects the role of fertility rate.

Methodology

Augmented Solow Growth Model

Solow (1956), cited in Schilirò (2017) criticizes the Keynesian Harrod-Domar long term growth model3 for the crucial assumption that production takes place under conditions of fixed proportions. Consequently, these conditions cause potential dysfunctional aspects of economic growth (for example, increased unemployment or prolonged inflation). Thus, Solow (1956, see Schilirò (2017) proposed a model of long-run growth "which accepts all the Harrod-Domar assumptions except that of fixed proportion" in production. It considers labour-capital substitution, that is, the change in production technique as a response to changes in relative prices of labor and capital. This implies that there is neoclassical aggregate production function at the center of Solow's growth model. In Malthus's model, economic growth is connected with a certain level of income per capita. When the income per capita exceeds the equilibrium level, the mortality rate decreases while the fertility rate increases, and vice versa.

Model Specification

The study adopts the model of Yujie (2015) whose study is on the relationship between fertility and economic growth in the developing countries. He stated his model as given below;

$$GDP = \alpha + \beta Ln(TFR) + \mu \qquad 3.1$$

In order to have better explanations, Yujie (2015) establishes extension models on the basis of the basic model. The extension models gradually consider other variables (LE、EDU、GC). Where GDP is the economic growth rate, TFR was used to represent total fertility rate, LE represents life expectancy, EDU indicates government expenditure on education, and GCF shows the gross capital formation. To suit the purpose of this study, in variables such as government expenditure on education, government expenditure on health, the interaction between human capital and fertility rate as well as the total government expenditure are added to the equation 3.7 above. That leads to the equation 3.2 below.

$$GDP_t = \beta_0 + \beta_1 TFR_t + \beta_2 EDU_t + \beta_3 HT_t + \beta_4 HT*TFR_t + \beta_5 GVX_t + \mu \qquad 3.2$$

Where GDP is the gross domestic product at time t,

TFR = Total fertility rate, EDU = government expenditure on education at time t, HT = government expenditure on health at time t, $HT*TFR_t$ = Interaction of the both the government expenditure on health and the total fertility rate at time t, GVX = total government expenditure at time t, μ = error term or stochastic variable. β_0 = autonomous variable, β_1- β_5 = the slopes of the independent variables.

The priori expectations are: η_1 >or < 0, η_2 >0, $\eta_3 > 0$, $\eta_4 > 0$ and $\eta_5 > 0$. The data on the variables are secondary data and they are sourced from the CBN statistical bulletin and the World development Indicators. While data on Fertility rate is sourced from the world development indicators, the data on other variables of the study are sourced from the CBN statistical Bulletin 2019. The Scope of the ranges between 1986 and 2018.

The Autoregressive Distributed Lagged Model

Autoregressive distributed lag (ARDL) bounds test is a method that does not have the issue of endogeneity. The ARDL estimates both the short run and the long run simultaneously. Before estimating the ARDL, there is a need to carry out bounds test in order to establish if there is cointegration or a long run relationship among the variables of the model. A cointegration is said to exist if their critical value falls above the I (1) boundaries at 1%, 5% or 10%. If it falls below the boundary, a short run relationship is said to exist. In a situation where it falls in between the boundaries, it is said that the result is inconclusive.

The Autoregressive Distributed Lagged Model for the equation 3.3 is stated as follows;

$$\Delta GDP_t = \varphi_0 + \sum_{i=0}^{p} \varphi_1 \Delta GDP_{t-1} + \sum_{i=0}^{p} \varphi_2 \Delta TFR_{t-1} + \sum_{i=0}^{p} \varphi_3 \Delta EDU_{t-1} + \sum_{i=0}^{p} \varphi_4 \Delta HT_{t-1} + \sum_{i=0}^{p} \varphi_5 \Delta HT*TFR_{t-1}$$
$$+ \sum_{i=0}^{p} \varphi_6 \Delta GVX_{t-1} + \sigma_1 GDP_t + \sigma_2 TFR_{t-1} + \sigma_3 EDU_{t-1} + \sigma_4 HT_{t-1} + \sigma_5 HT*TFR_{t-1} + \sigma_6 GVX_{t-1} + \mu_t \qquad (3.3)$$

In order to choose an appropriate time series model, the investigation of the time series data to verify the results of stationarity and cointegration tests is central. This research paper therefore employs the recently developed autoregressive distributed lag (ARDL) bounds testing approach to cointegration developed by Pesaran and Shin (1995). The technique has several advantages over other estimation techniques like Engle and Granger (1987) and Johansen (1991). First, it can be applied regardless of the order of the integration of the regressors (either I (1) and/or I (0)); it is a more statistically significant approach for examining correlation when faced with small data size as other techniques require large data size for validity to hold. It also allows for the variables to have different optimal lags, which

is not applicable to other techniques. Furthermore, the technique uses a single reduced form equation for determining both long-run and short-run relationship among variables (Babajide and Lawal, 2016, Pesaran and Shin (1999)). The study also carried out normality test and stability test.

Estimation and Empirical Results

This section presents the analysis of results. The first section is subdivided into trend analysis, descriptive statistics of the data; the unit root test, Bounds test and the outcome of both the cointegration and the long run relationship among the variables. The second section contains the discussion of the results that are presented in section one and relevant policies in this study. The last section looks into the comparison of results to the findings of the previous authors in this area.

Table 1: The results of Augmented Dickey-Fuller (ADF) and Philips-Perron (PP)

	Augmented Dickey-Fuller (ADF)		**Philips-Perron (PP)**		
Variable	Level	1st difference	Level	1st difference	Remark
GDP	-0.3599	-2.3870***	3.4203	-2.6627***	I (1)
TFR	-2.9972*	-2.9336	-2.9798*	-4.58070	I (0)
EDU	3.3678	-8.8753*	0.1193	-11.4312*	I (1)
HT	-2.7383	-2.0382*	-2.9308	-6.0289*	I (1)
HT*TFR	0.4074	-2.8879***	-2.1312	-5.3853***	I (1)
GVX	1.3699	-3.0113**	-1.3589	-3.7849**	1(1)

Source: Computed by the Author, 2020

Asterisks (*, **, ***) indicate stationarity of the data at 10%, 5% and 1% respectively. The unit root test was carried out using Augmented Dickey Fuller Test and Philips Perron. Decision rule: we reject the null hypothesis if the tabulated value is greater than the critical value at a chosen level of significance which is 5% in this study. Virtually all the variables are stationary at first difference except that on the total fertility rate which is stationary at levels. It is important that none of the variables is stationary at second difference as this may lead to achieving a spurious result.

Having established the stationarity of the data we may therefore proceed to carry out co-integrating bounds test in order to further establish a long relationship among the variables of the model of this study.

Table 2: Bounds Test (Test for Cointegration)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
			Asymptotic: n=1000	
F-statistic	13.54460	10%	2.75	3.79
K	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

Source: Author's computation, 2020.

Since the F-statistics is more than the critical value at 5%, we can fail to accept the null hypothesis that no long run relationship exists among the variables of the study while we accept the alternative hypothesis that a long run relationship exists among the variables.

Decision rule; the value of the F-statistic (13.4) is compared to that of the critical values at different levels of significance. When the F-statistic is greater than I1 Bound, we say a long run relationship exists at the chosen levels of significance. If on the other hand the F-statistic falls below the lower bounds, I0, we conclude that the relationship is short run. If it falls in between the upper bound and the lower bound, it can then be concluded that the relationship is conclusive. As shown in the table, the F-statistic is greater than the critical values at 10% and 5%, 2.5% and at 1% levels of significance, we therefore deduce that there is a long run relationship among the variables of the model of this study.

Table 4.3: ARDL Long Run Form model
Dependent Variable: GDP
Method: ARDL
Sample (adjusted): 1988 2018

Variable	Coeff.	Std. Error	t-stat	Prob
TFR	0.908716	0.071648	12.68297	0.0000
EDU	0.033693	0.033935	0.992864	0.0499
HT	0.0096	0.01661	0.005784	0.0255
HT_TFR	-0.023956	0.024977	-0.959121	0.3656
GVX	0.006857	0.025213	0.271946	0.0226
Cointeq(-1)	-0.912522	0.165322	-5.519661	0.0000
R-sq.	0.764684			
Adj. R. Sq.	0.71762			
F-Stat.	16.248			
Prob(F-statistic)				0.0000
Heteroskedasticity				0.1794
Serial Correlation				0.2746
Normality test				0.6773

Source: Author's computation, 2020.

The figure above contains the long run ARDL bounds test result. The result shows that total fertility rate has a positive significant relationship with the growth of the Nigerian economy. The relationship is significant at 1% level. It shows that a 1% increase in the total fertility rate will lead to 0.9% increase in the economic performance. An increasing in fertility rate may indicate people tend to spend more on the hospital bills which help contributes to revenue of the government.

The result on government expenditure on education shows it has a positive significant relationship with the real GDP in Nigeria. The relationship is statistically significant at 5%. The result shows that a 1% increase in the education expenditure of the government will lead to 0.03% increase in the real GDP.

The result on the government expenditure on health shows it has a positive significant relationship with the real GDP in Nigeria. The result shows that a 1% increase in the government expenditure on health will lead to a 0.009% increase in the real GDP. The result

on interaction of health expenditure and fertility rate has been shown not to have any significant relationship with the real GDP.

The result on total government expenditure shows it has a positive significant relationship with the real GDP. It is significant at 5% level. The result implies that a 1% increase in the total government expenditure will have 0.007% increase in the real GDP.

The variable of interest in this short run is the result on the speed of adjustment of the error correction lag one (ECM (-1) which represents the speed at which any observed disequilibrium in the short run will re-adjust back to equilibrium in the long run. The result implies that at the speed of 91.3 % the disequilibrium will be corrected back to equilibrium in the long run.

The result on the adjusted R squared shows that 95% of the change that take place in the dependent variable is explained by the independent variables. The result also shows that the value of the Durbin Watson (2.5) is greater than that of the R squared (0.71) as this further confirms that the model of this study is a long run model.

The Adjusted R square has been shown to represent 71.8 % of the behavior of the dependent variable explained by the set of the independent variables as contained in the model of the study. It is equally important that the value of the Durbin Watson is more that of the adjusted R square. This further confirms that our model is a long run model.

Discussion of Results and Implications

The findings of the study have revealed that total fertility rate has a positive significant relationship with the real GDP in Nigeria. The study has also revealed that government expenditure on education, expenditure on health and the total government expenditure al l has positive and statistically significant impact on the real GDP in Nigeria. It is widely accepted that education creates improved citizens and helps to upgrade the general standard of living in a society. Therefore, positive social change is likely to be associated with the production of qualitative citizenry.

The need for increasing public expenditure could be found in various theories of public expenditure. The theories of Wagner, Musgrave theory of increasing state activities, the Keynesian theory of deficit financing (Alajekwu and Obi 2011), all emphasized the need for government spending to enhance economic welfare through its spending in the provision of public goods. According to Keynesian view (Alajekwu and Obi 2011), government could reverse economic downturns by borrowing money from the private sector and then returning the money to the private sector through various spending programs.

Conclusion

Fertility rate has a positive relationship with the growth of the economy. This can be by a way of the contributions of human capital. There is a need for human capital to help exploit the natural resources the country is endowed with. The importance of human capital can be observed from the fact that a country such as Canada shows it needs skilled workers to come into the country.

Government expenditure on education contributes to the development of the economy.

The government expenditure on health also goes a long way in improving on the growth of the economy. Government total expenditure increase which is otherwise known as expansive fiscal policy leads to an improvement in the economic growth.

Recommendation

There is a need for government to provide the social and economic framework in order to cater for the increasing population which is as a result of a high fertility rate. Government should endaevour to increase the allocation to education probably up to 26% as it has been shown that the more people are educated, the higher their tax capacity. There should be increase in government health expenditure in order to avoid the incessant industrial actions of the personnel in the health sector.

Future studies should endeavor to increase the scope of the data in order make and have a more robust result. This will also allow for the opportunity to cover some key periods in the health and educational sectors before the year 1986.

REFERENCE

Adediran, O. (2012). Effects of population on economic development in Nigeria: A quantitative assessment. *International journal of physical and social sciences,* 2(5), 1-13.

Adelowokan, O.A. (2012). Growth effect of Education and Health Expenditure in Nigeria (1970- 2010). *African Journal of Scientific Research*, 10(1), pp. 510-528.

Adeyemi, P.A & Ogunsola A.J. (2016). The Impact of Human Capital Development on Economic Growth in Nigeria: ARDL Approach. *IOSR Journal of Humanities and Social Science* (IOSR-JHSS), 21(3), 01-07.

Aigbokhan, B. O. Imahe, E. & Ailemen, M. I. (2017). *Education expenditure and human capital development in Nigeria*: Any correlation so far, research paper, Ambrose Ali University, Ekpoma, Nigeria.

Alajekwu U. B & Obi C. O. (2011). *Impact of Government expenditure on economic growth in Nigeria*. Int. J. Bank. Financ. 3:1.

Amassoma, D. & Nwosa, P. I. (2018). Investment in human capital and economic growth in Nigeria: A causality approach. *Canadian Journal of Social Research*, 7(4), 114-120.

Babajide, A. A. & Lawa, A. IL (2016). Macroeonomic Behaviour and FDI inflows in Nigeria: An application of the ARDL model. *British Journal of Economics, Finance and Management Science*, 11(1), 84-107.

Engle R. & Granger J. (1987). Co-integration and Error Correction: Representation, Estimation and Testing. *Economietrica*, 55(2), 251-276

Gideon, K.T., Gachanja, P. & Amadi, O. (2013). The impact of population changes on economic growth in Kenya. *International Journal of Economics and Management Sciences*, 2(6), 43-60.

Johansen, S. (1991). *Some Structural Hypothesis in a Multivariate Cointegration Analysis of the Purchasing Power Parity and the Uncovered Interest Parity for UK*, to appear in Journal of Econometrics.

Kirdina, S. G., (2018). *Institutional Matrices and Institutional Changes* [in:] Economic Transformation and Evolutionary Theory of J. Schumpeter. The 5th International Symposium on Evolutionary Economics, Moscow, p. 182-195.

Niaz M. (2018). Human Capital Development and Economic Growth in Bangladesh. *Journal of World Economic Research*. ISSN: 2328-773X (Print); ISSN: 2328-7748.

Ogunleye, O., Owolabi, A., Sanyaolu, O., & Lawal, O. (2016). Human Capital Development and Economic Growth in Nigeria. *IJRDO-Journal of Business Management*, 24(5), 5-6661.

Oladeji, A. O. (2015). Impact of Human Capital Development on Economic Growth in Nigeria. *International Journal of Recent Research in Commerce Economics and Management*. 2(2) 151- 164.

Olalekan O. (2014). Human Capital and Economic Growth in Nigeria. International Journal of Innovation and Scientific Research, vol. 11, no. 2, pp. 291–294.

Ozekhome, H. O. 2017. Economic and Institutional Policies for Sustained Economic Growth for an Oil-Dependent Nigerian Economy in Recession. SAU Journal of Economics, 1(1), pp. 32-48

Peasaran, M. H. & Y. Shin (1995). *ìLong-Run Structural Modeling*, î unpublished manuscript, University of Cambridge.

Pesaran, M. H., & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis Chapter 11 in S. Strom. Econometrics and Economic Theory in the 20th Century: *The Ragnar Frisch Centennial Symposium.* Cambridge: Cambridge University Press.

Ragan, C. & Lipsey, R.G. (2005). Economics, Eleventh Canadian Edition. Instructor's Resource CD-ROM. Pearson Education Canada.

Ronald L. & Andrew M. (2008). Fertility, Human Capital, and Economic Growth over the Demographic Transition. Received: 23 July 2008/Accepted: 16 March 2009/Published online: 19 June 2009.

Schilirò, D. (2017). A glance at Solow's growth theory. Munich Personal RePEc Archive. University of Messina, Italy.

Sebnem Kalemli-Ozcan a, Harl E. Ryder a, David N. Weil (2000). Mortality decline, human capital investment, and economic growth. A Department of Economics, Brown University, Box B, Providence, RI 02912, US. *Journal of Development Economics*, 10(2), 80-89.

Solow, R. (1956). A Contribution to the Theory of Economic Growth. The Quarterly Journal of Economics, 70(1), 65-94.

Todaro, M., & Smith, S. C. (2011). Economic Development (11th Edition). Addison-Wesley: London.

Van Groezen, B. and L. Meijdam (2008) Growing old and staying young: population policy in an ageing closed economy. *Journal of Population Economics* 21, 573-588.

World Bank (2016). *Population growth* (Annual %). Available at: https://data.worldbank.org/indicator/SP.POP.GROW?locations=NG.

Youdeowei T. (2019). Players unimpressed with N620.5bn 2019 education budget. Retrieve From: https://punchng.com/players-unimpressed-with-n620-5bn-2019-education-budget/,

Yujie Li. (2015). The Relationship between Fertility Rate and Economic Growth in Developing Countries. *Master programme in Economic Demography.*