RAPID POPULATION GROWTH AND ECONOMIC DEVELOPMENT ISSUES IN NIGERIA

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ABSTRACT
The study examined rapid population growth and economic development issues in Nigeria. This is on the premise that Nigeria has a rapidly growing population forecasted to be about 400 million in 2050, with a very high proportion of youths. The country has struggled against demographic tide since independence, and there are widening gaps in poverty, unemployment, and inequality which are factors elevating the country's under-development. The study adopted an ex-post facto research design and, obtained secondary data from the publications of the Central Bank of Nigeria, the National Bureau of Statistics, and the World Bank. Descriptive and Analytical statistics tools wereused to analyze the data. The findings of the study revealed thatpopulation, remittances, gross domestic product, and unemployment negatively and significantly affect the Human Development Index in Nigeria, while foreign direct investment and effective governance exerteda positive and significant effect. So, the study makes the following recommendations; Nigeria must control its rapidly growing population by formulating and implementing population and economic policies that are supportive of all-inclusive economic growth. The high rate of youth employment should be checked by developing skills set through quality education, improved health care, and vocational training for the youths.

Keywords: Population Growth, Economic Development, Poverty, Inequality, Corruption
JEL Classificationcode*:* O11, J11

1. INTRODUCTION

Nigeria is the seventh-largest populated country in the world and the most populous in Africa – with a population of 193,392,517 growing at 2.62% per annum (NBS, 2020 est.). Several policies and programmes have been introduced over the last three decades to address Nigeria's rapid population growth and the challenges it poses for economic development. Some of these policies are the National Policy on Population for Development, Unity, Progress and Self Reliance, Health Policy Project (HPP), and National Policy on Population for sustainable development (NPP). Despite this, the country's population is projected to increase to 401,315 million, and become the third-largest in the world by mid-century in 2050 (United Nations Population Prospect, 2017). Nigeria's sustained population growth rate may continue for the foreseeable future because Nigerians have not been able to space births and control a high fertility rate. This is a result of cultural preferences, religious inclinations, poverty, and declining mortality. These, amongst other factors, can have far-reaching implications for sustainable economic development in Nigeria.

The relationship between population and sustainable economic development has attracted considerable attention from economists and researchers in both Developed and Less Developed Countries (LDCs) of the world. However, there is still no consensus on whether population growth is beneficial or detrimental to the economic performance of a nation. It is believed that population growth promotes economic development in advanced countries and impedes progress in LDCs (Jhingan, 2007). This is axiomatic given the discrepancy between the two regions, a pointer to the

inconclusive debate about population growth and economic development. For Nigeria, the National Population Commission (NPC) has estimated the country's population growth rate at about 3.02% per annum since 2006 – that is a population that is capable of doubling itself in less than twenty -three years. This high rate of population growth is a concern and a challenge as the country's economic growth rate have been below this population growth rate for about a decade now.

As a result, the standard of living is lower than it was a few decades ago, as appreciable gains made in aggregate income have been consumed by the increasing population. Also, despite the population policies implemented in Nigeria, population dynamics may have been checked more by low life expectancies, periodic famines, insurgency, and terrorism than the policies. So, rapid population growth persists as one of the central problems of poverty and sustainable economic development in Nigeria. This is because population growth today is no longer simply one of numbers but involves the quality of life and material wellbeing of the people (International Conference on Population and Development, 1994). Around a quarter of Nigeria's population still lives at bare subsistence level and more than two-thirds (69%) live on an income that is below 9.7% of per capita income (NBS, 2015). 52.0% of this population are living in urban areas, these are mainly youths with their unemployment rate as high as 34.7% (NBS, Q2 2020), which presents a clear case of youth bulge and its possible adverse consequences in the country.

The study is justified because development economists and other social scientists have debated the seriousness of the consequences of rapid population growth on the economy, we need to ascertain the direction of Nigeria. In the plethora of problems facing the Nigerian economy today, unrestrained population increase may be one of the major causes as it can result in poverty, low levels of living, and environmental degradation amongst other problems. Predictions of world food catastrophes and ecological disasters are also often attributed to the growth in population numbers. This study will provide the framework to curtail the adverse consequences of rapid population growth, as it exposes the underlining currents of youth bulge such as unemployment, poverty, insurgency, terrorism, etc that are threats to the country's democracy and sovereignty. This picture of Nigeria's population dynamics presents the objective of this study which is to examine the effect of rapid population growth on economic development in Nigeria. The paper explores the Nigerian direction in five sections; section one is the introduction, section two is concerned with the review of related literature. Section three is on the research methodology, while section four deals with the results and findings of the study, and section five is the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Conceptual clarifications: Rapid Population Growth and Economic Development

population is the total number of people living within a geographical area or country at a particular time. According to Anyanwuocha (2006), population growth is the increase in the number of people that reside within a geographical or political boundary within a given period. The formula used to determine whether there has been population growth is (Birth Rate + Immigration) – (Death rate + Emigration). For this study, it is the net change in the number of persons residing in Nigeria, as following decades of very fast population growth, there is the concern that Nigeria's population growth is out-of-control, and an end seems not to be in sight. This will put pressure on available resources thereby creating gaps that will result in adverse consequences upon the nation. The measure of this in this study is Nigeria's population growth rate.

According to the Brundtland (1987) report, sustainable economic development is defined as meeting the needs of the present generation without compromising the needs of future generations. Three main elements of sustainable development are; economic sustainability, social inclusion, and environmental sustainability. Sustainable development is a socio-economic movement aimed at integrating political, economic, and social activities, focused on protecting the natural balance and the sustainability of basic natural processes to ensure meeting the basic needs of certain communities and citizens of both the contemporary and future generations (Raszkowski & Bartniczak, 2018. Nwosu (2013) defines economic development as the process by which a nation improves the economic well-being and quality of life for its citizens and community at large by creating and/or retaining jobs and supporting or growing incomes and the tax base. According to Jhingan (2007), economic development is a wider concept than economic growth. The 1994 International Conference on Population and Development (ICPD), held in Cairo shaped population issues with an added caveat "Development" and re-ordered priorities and concerns and prescribed that population issues should be discussed and considered no longer distinctively, but be tackled as "Population and Development" to give true meaning reflective of the people that make up the numbers. It is in the light of this, that this study takes economic development to mean economic growth plus change, that is sustainable 'if and only if related to quality changes in economic institutions, productivity, and knowledge which propels "upward movement of the entire socio-economic system". This implies an increase in per capita income, better education, and health as enunciated in the United Nations Human Development Index. This is measured as a composite index by the United Nations (Human Development Report, 2019).

The concept of economic development was also provided for in the economic theory of sustainability by Dasgupta and Heal (1974), Solow (1974), and Stiglitz (1974). Their models represented wellbeing over time in terms of welfare maximization (Toman, 1998). Economic sustainability is inextricably linked to both environmental and social sustainability (Reddy & Thomson, 2015), and economies will not be sustainable if natural resources are used beyond the limits, this study considers economic sustainability as the initial agenda to be treated for economic growth and development of nations.

2.2 Theoretical literature

According to Thuku, Gachanja & Almadi (2013), Economists are torn between three theories when it comes to the issues of population and the economy; first, that population growth stimulates economic growth and development; second, that population increase is detrimental to economic growth due to a variety of problems caused by the growth; finally, that population growth does not have any impact on economic growth. From the available literature, it seems that the negative views regarding the consequences of population growth have been prevailing over the positive opinions ever since.The early population growth discourse was initiated by Malthus (1798) and was continued by Karl Marx and Friedrich Engels. The controversy has been that while Malthus posited that population tends to outstrip resources, Marx and Engels presented three general lines of argument: (i) population growth is not a real problem, (ii) it is a deliberately contrived false issue, and (iii) it is a desirable phenomenon. These views contradict Malthus' line of thought who believed there is a need to curtail population growth because of the negative economic, social, and environmental consequences associated with it. Malthus was termed as a prophet because he warned about the danger of "overpopulation." As Kelley and Schmidt (1996) pointed out, pessimism about the economic impacts of the population has dominated the thinking of population analysis since the original treatise by Malthus published over two centuries ago, and

regarded by modern economists as the Malthusian population trap. It anticipates a threshold population level at which population increase was bound to stop because life-sustaining resources, which increase at an arithmetic rate, would be insufficient to support the human population, which increases at a geometric rate. Even, as this may not be the case in many advanced countries, the same cannot be said of many developing countries such as Nigeria which exhibits fears expressed by Malthus long ago.

2.3 Empirical Literature

Onyeoma (2020) studied the influence of the rising population on Poverty and Unemployment in Nigeria using Autoregressive Distributed Lag Bounds (ARDL) approach on annual data from 1980-2018. It explores the dynamic relationship between population growth and selected macroeconomic variables of economic growth, poverty, and unemployment as well as the direction of causality between them. The study also found that population growth and its components exerted a negative impact on the overall economic conditions in Nigeria. Okonkwo, Kalu & Nwosu (2019), the study adopted the political economy methodology in their study on restructuring for economic diversification in Nigeria. It stated that the Nigerian political economy has unfortunately centralized its economic resources making it impossible for active economic participation of the ever-increasing populace. Findings of the study revealed that the devolution of economic resource is a sine qua non for sustainable growth and development that can support the rising population growth.Olusogo, Oluwarotimi & Muazu (2018) explored the effect of population growth on the economic growth of Nigeria from 1981 to 2015. Data used were GDP and exchange rate, Population growth rate, fertility rate, and crude death rate. Ordinary least squares regression was used to analyze these data. The findings of the study revealed that population growth has a positive and significant effect on the economic growth of Nigeria, while fertility was negative and significant for economic growth in Nigeria. The exchange rate and crude death rate are however insignificant for the economic growth of Nigeria.

Sebikabu et al (2020), this study explores the effects of population growth on economic development in Rwanda from 1974–2013. The study uses data from the World Development Indicators (WDI) and uses economic growth as a proxy for economic development and the neoclassical growth model to capture the effects of population growth on economic development. It also uses the ARDL technique for a time series analysis. In the long run, ARDL results show that population growth has a positive and statistically significant impact on economic development. In the short run, population growth does not have any significant impact on economic development in Rwanda. Iyoboyi (2020) investigates the long run impact of institutions on economic growth, using the Dynamic Ordinary Least Squares technique. There was empirical evidence of a statistically significant and positive relationship between property rights and growth. Law and order was also statistically significant and positively associated with growth, while political terror exerted a negative impact on growth in the period of investigation. Keghter, Ogbonna, & Afamefuna (2020) this paper examined the role of institutional quality in economic growth enhancement and the precise role it plays through the channel of health expenditure. The ARDL model was employed and there was evidence that the long-run effects of health expenditure and institutional quality on economic growth are both surprisingly negative, with only institutional quality having a statistically significant relationship.

Chowdhury and Hossain (2019) did a study on Population Growth and Economic Development in Bangladesh: Revisited Malthus. A simple linear regression analysis was undertaken to determine the relationship between population growth and economic development.

The result indicated that population growth is adversely related to per capita GDP growth, which means rapid population growth is a real problem for the development of Bangladesh. Arshad (2019), examined the role of institutional quality in economic growth and more specifically the role it plays via the channel of foreign direct investments. This paper uses a larger dataset of 104 countries and applies GMM estimation method to dynamic panel data to evaluate the direct impact of institutional quality on economic growth and the indirect impact of institutional quality on economic growth through enhancing the FDI-induced economic growth. The paper provides evidence that both FDI inflows and institutional quality cause stronger economic growth in low and middle-income countries.

Aidi, Emecheta & Ngwudiobu (2016) carried out a study on Population Dynamics and Economic Growth in Nigeria using time series data spanning from 1970 to 2014. The data were analysed using the ordinary least square estimation technique. The result revealed among others that all the core variables (i.e. fertility, mortality, and netmigration) of the study are inversely related to economic growth during the investigated period. The study further revealed that gross fixed capital formation (GFCF) and savings are strong drivers of economic growth in Nigeria. Lawanson (2016) examined Rapid Population Growth and Economic Development in Nigeria using the ordinary least square technique, the study showed that a growing economy such as Nigeria needs a growing population, that is, an increased supply of workers and consumers, though the exact nature of this relationship is complicated {population shows a positive but insignificant effect on economic growth (at first difference) and a negative but significant effect on economic growth (at first difference lagged) in Nigeria}.

Orumie (2016) examined the effect of the Unemployment Rate and Population Growth Rate on Gross Domestic Product in Nigeria. The study applied the multiple regression model conducted on data obtained from the National Bureau of statistics bulletin and Central Bank of Nigeria within the period 1970 – 2010. The result of the analysis indicated that there is a systematic relationship between the gross domestic product to population growth and unemployment rate. The result also revealed that unemployment and population growth contribute commensurable to gross domestic product. Furthermore, the result showed that unemployment contributes more to the national gross domestic product during this period in line with existing work. The paper failed to indicate whether the relationship between the unemployment rate and population growth with GDP is positive or negative. It also failed to suggest concrete recommendations for the study. Abdullah, Shah, Sargani, Ali & Siraj (2015) examined the effect of the Increase in Population on the Economic Growth of Bangladesh using data from 1980 to 2005 by employing a multiple linear regression model. The result reveals that economic growth and population are both negatively correlated and that an increase in population will harm the economic growth of Bangladesh.

Tartiyus, Dauda & Peter (2015) carried out a research titled 'Impact of Population Growth on Economic Growth in Nigeria', using secondary data obtained from the World Development Indicators from 1980-2010 which were analysed using regression analysis as well as descriptive statistics. The result revealed that there is a positive relationship between economic growth (proxied by GDP growth) and population, fertility and export growth; while negative relationships were found between economic growth (proxied by GDP growth) and life expectancy, and crude death rate. Nwosu, Dike & Okwara (2014) examined the Effects of Population Growth on Economic Growth in Nigeria employing annual secondary observation from 1960 to 2008. The empirical results were based on Augmented Dickey-Fuller (ADF) stationarity test combined with Granger Causality and Cointegration tests. Empirical results support that population growth has a significant impact on economic growth. The study also found that there is a sustainable long-run

equilibrium relationship between economic growth and population growth. There is also evidence of unidirectional causality between population growth and economic growth. Ukpong, Ekpebu & Ofem (2013) in their research discusses issues of poverty and population growth in Nigeria. The Augmented Dickey-Fuller tests, as well as the Engle-Granger and Johansen's cointegration tests,were used to test for cointegration and stationarity of the time series data on poverty rate, population growth, and gross domestic product (GDP) real growth rate in Nigeria, while the ordinary least squares (OLS) regression analysis was used. The results showed a positive relationship between poverty rate and population growth, and a negative relationship between GDP real growth rate and poverty rate in Nigeria. Adewole (2012) in his research Effect of Population on Economic Development in Nigeria: A Quantitative Assessment adopted the ordinary least square method of analysis to examine the time series properties using the Phillips-Perron (PP) non-parametric unit root test. The study used trend analysis of the study with the scope spanning between 1981 and 2007. The analysis revealed that population growth has a positive and significant impact on economic sustainability proxied as the real gross domestic product (RGDP) and Per Capita Income.

2.4 Gaps in Literature and Value Addition

From the literature, a myriad of studies has been carried out within Nigeria (Aidi, Emecheta & Ngwudiobu, 2016 and Ogboru & Anga, 2015) and outside Nigeria (Abdullah, Shah, Sargani, Ali & Siraj, 2015 and Ullas & Anjum, 2012) to examine the effect of population growth on economic growth. The studies have shown mixed results. In this regard, apart from population growth, pertinent variables such as gross domestic product, foreign direct investment, remittances, effective governance, and unemployment were introduced in this study to examine this relationship. Economic development was proxy by the Human Development Index (HDI) which goes beyond income in the analysis of sustainable development, to include education and health which are elements that will drive the sustenance. Details are attached in the appendix.

3.1 METHODOLOGY

The research design adopted for this study is the ex-post facto research design. The relevant data were obtained from secondary sources. These data include components of United Nations Human Development Index composites and Population variables which were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, United Nations Human Development Report (UNHDR), and the National Bureau of Statistics. The study covered 15 years spanning when Nigeria had its last general population and Housing census in 2006 – 2019. Descriptive and Analytical econometric tools were applied as the method of data analysis to give empirical content to the stated objectives. The Autoregressive Distributed Lag Modelling (ARDL) approach wasemployed as the main tool of estimation with the aid of the E-views package version 10.0. Other empirical tools such as the Bound Cointegration test, ARDL Bounds Test, parameter stability test, unit root test, and model adequacy tests wereemployed to investigate the characteristics of the data. This is to ensure that in all cases, the results obtained do not suffer from problems of non-normality, serial correlation, heteroscedasticity, and model misspecification.

3.2 Model Specification

The theoretical model for this work stems from the theoretical underpinning of the Malthusian population theory. Malthus empirically examined the relationship between population growth and economic development – and found the relationship to be negative. Malthus took into cognizance the effect of increasing fertility and declining mortality on income per head. In other

words, his analysis empirically investigated how population growth, increasing fertility, and declining mortality affect per capita income. Therefore, the Malthusian theoretical postulation provides a suitable basis for the study in analyzing the effect of population growth on economic sustainability in Nigeria.

But this study went beyond income to examine issues of economic development. Thus, the model used the Human Development Index (HDI) - a key composite index of United Nations human development which is a summary measure for assessing long-term progress in three basic dimensions of human development that goes beyond income: a long and healthy life, access to knowledge and a decent standard of living. This modelevaluates the concept of economic developmentproxy by a United Nations composite index (Human Development Index) to examine the effect of population growth on it. Fusing this component of economic sustainability and population, the study takes a cue from the modeladopted by (Mbutor, Ochu & Okafor, 2013).The empirical relationship is specified as follows:

$$HDI = f(\text{POP}, \text{GDP}, \text{FDI}, \text{REM}, \text{EGI}, \text{UEM}) \quad . \quad . \quad . \text{egn1}$$

Where: HDI = Human Development Index (Index)

POP = Population Growth Rate (Rate)

GDP = Real Gross Domestic Product (Rate)

FDI = Foreign Direct Investment: GDP (%)

REM = Remittances from Abroad: GDP (%)

EGI = Effective Governance Index (Index)

UEM = Unemployment Rate (Rate)

The ARDL model is presented as follows:

$$\begin{aligned}\Delta HDI_t = {} & \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} \Delta \text{HDI}_{t-i} + \sum_{i=1}^{k} \alpha_{2i} \Delta \text{POP}_{t-i} + \sum_{i=1}^{k} \alpha_{3i} \Delta \text{GDP}_{t-i} + \sum_{i=1}^{k} \alpha_{4i} \Delta \text{FDI}_{t-i} \\ & + \sum_{i=1}^{k} \alpha_{5i} \Delta \text{REM}_{t-i} + \sum_{i=1}^{k} \alpha_{6i} \Delta \text{EGI}_{t-i} + \sum_{i=1}^{k} \alpha_{7i} \Delta \text{UEM}_{t-i} + \gamma_1 HDI_{t-1} \\ & + \gamma_2 POP_{t-1} + \gamma_3 GDP_{t-1} + \gamma_4 FDI_{t-1} + \gamma_5 REM_{t-1} + \gamma_6 EGI_{t-1} + \gamma_7 UEM_{t-1} \\ & + \varepsilon_t\end{aligned}$$

The expression $\alpha_1 - \alpha_7$ with the summation signs depicts the short-run relationship between the variables whereas the expression $\gamma_1 - \gamma_7$ relates to the long-run dynamics of the variables.The a priori economic criterion is premised on economic theory; the study expects that the coefficients of gross domestic product, foreign direct investment, remittances and effective governance index should have positive relationship with Human development index, while that of population and unemployment should be negative.

The choice of the Bounds technique is based on three validations. First, Pesaran, Shin & Smith (2001) advocated the use of the Auto-Regressive Distribution Lag model for estimation when the order of cointegration is recognized. Second, the bounds test allows a mixture of I (1) and I (0) variables as regressors, that is, the order of integration of appropriate variables may not necessarily be the same. Third, this technique is suitable for small or finite sample sizes. Fourth, the long and short-run parameters of the model can be estimated simultaneously.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics

The data were examined, and the Jarque-Bera statistic tests for the normality of data indicate the error terms in our sample; Human development index, population, gross domestic product, foreign direct investment, and remittances follow the normal distribution, while effective governance index and unemployment were not normally distributed at the 5% level of significance. These do not preclude the use of multivariate regression analysis that is used in this study. That is, keeping in mind that the JB test is a large-sample test, our sample of 56 observations may not necessarily be large. Normality is also not necessary to obtain many of the results used in multivariate regression analysis as it is possible to relax this assumption and still retain most of the statistical results obtained.

Table 1: Descriptive Statistics of Variables

	HDI	POP	GDP	FDI	REM	EGI	UEM
Mean	0.499821	2.640179	4.861071	1.476964	5.334464	1.045893	21.26393
Median	0.500000	2.650000	5.615000	1.280000	5.420000	1.000000	22.83500
Std. Dev.	0.026111	0.036005	2.328093	0.755722	1.008226	0.088990	4.707014
Skewness	0.236092	-0.679705	-0.162282	0.374576	0.057130	0.754329	-0.813636
Kurtosis	1.890400	2.360452	1.532782	1.920842	2.117412	2.220553	2.442807
Jarque-Bera	3.393064	5.266369	5.268835	4.026893	1.848040	6.728365	6.903114
Probability	0.183318	0.071849	0.071761	0.133528	0.396920	0.034590	0.031696
Observations	56	56	56	56	56	56	56

Source: *Extracted from E-views 10*

4.2 Analytical Statistics

4.2.1 Pre-estimation Diagnostics/tests

The tests for stationarity reported the variables to have a mixed order of stability1(0) and 1(1). To proceed, the Bounds Test for Cointegration was employed to investigate the presence of a long-run relationship among the variables and the results obtained from the data showed evidence of long-run cointegration, as the F-statistic falls outside the 5% critical bounds adopted for the study.

4.2.2 Post Estimation Tests

The tests for serial correlation, multicollinearity, and heteroscedasticity were conducted and highlighted as follows; the serial correlation test for the model indicates that serial correlation is absent and is shown in Table 2.

Table 2:Serial Correlation Test Result

	LM-Stat	Prob.
F-stat	5.3092	0.0741
Obs R-sq	9.5843	0.8932

Source: *Author's compilation from E-views 10 Output, October (2020)*

The null hypothesis of no serial correlation is accepted. The test for the presence or absence of heteroscedasticity is shown in Table 3.

Table 3: **Heteroscedasticity Test Result (Harvey test)**

F-Statistic	Prob.
0.0827	0.9965
0.8762	0.9899

Source: *Author's compilation from E-views 10 Output, October (2020)*

The result revealed that the disturbances of μ_i exhibit the equal variance assumption of homoscedasticity. This is because the probability of obtaining a chi-square value of 566.49 or greater is statistically different from zero.

Table 4: Multicollinearity Test Result

	HDI	POP	GDP	FDI	REM	EGI	UEM
HDI	1.000000	-0.510540	-0.806583	-0.797782	-0.445568	-0.538195	0.783985
POP	-0.510540	1.000000	0.551577	0.402153	-0.481905	0.453070	-0.162797
GDP	-0.806583	0.551577	1.000000	0.721548	0.194394	0.506046	-0.648156
FDI	-0.797782	0.402153	0.721548	1.000000	0.493472	0.347137	-0.668242
REM	-0.445568	-0.481905	0.194394	0.493472	1.000000	-0.119475	-0.490502
EGI	-0.538195	0.453070	0.506046	0.347137	-0.119475	1.000000	-0.047886
UEM	0.783985	-0.162797	-0.648156	-0.668242	-0.490502	-0.047886	1.000000

Source: *Author's compilation from E-views 10 Output, October (2020)*

From the correlation matrix above, we can confirm that there is no pair-wise correlation coefficient that is over 0.80 (Gujarati and Porter, 2006). Hence, the variables cannot be said to be collinear.POP is 0.51, GDP is -0.80, FDI is -0.79, REM is -0.44, EGI is -0.53 and UEM having 0.78. Therefore. It can be concluded that there is no multicollinearity among the regressors.

4.2.3 Estimation Results

Having established the relationship, the Auto-Regressive Distribution Lag (ARDL) methodwas employed to examine the details in the relationships and Tables 5 and6 holds them.

Table 5: Short Run Coefficients of the ARDL Model

Variables	Coefficient	Standard Error	t-statistic	Prob.
Dependent Variable: Human Development Index (HDI)				
∆POP	-0.0761	0.0164	-4.6209	0.0000
∆FDI	0.0016	0.0006	2.6816	0.0101
∆REM	-0.0018	0.0004	-3.7821	0.0004
∆EGI	0.0093	0.0030	3.0300	0.0040
∆GDP	-0.0009	0.0001	-5.3879	0.0000
∆UEM	0.0004	0.0001	3.5957	0.0008
C	0.2790	0.0552	5.0524	0.0000
CointEq(-1)	-0.4675	0.1380	-2.7167	0.0137

Source: Eviews 10 Output, 2020

Table 6: Long Run Coefficients of the ARDL Model

Variables	Coefficient	Standard Error	t-statistic	Prob.
Dependent Variable: Human Development Index (HDI)				
POP	-0.4547	0.0825	-5.5108	0.0000
FDI	0.0098	0.0044	2.2055	0.0323
REM	-0.0109	0.0030	-3.5985	0.0008
EGI	0.0559	0.0204	2.7364	0.0087
GDP	-.0.0090	0.0001	-5.3870	0.0002
UEM	-0.0027	0.0004	-6.0938	0.0080
C	1.6655	0.2258	7.3749	0.0000

Source: Eviews 10 Output, 2020

The results of the regression showed that population exerted a negative and significant effect on the human development index in both the short-run and long-run periods in line with the Malthusian theoretical formulation of the study. This result is in agreement with the study done by Onyeoma (2020) and Aidi, Emecheta & Ngwudiobu (2016), and it is at variance with the study Olusogo, Oluwarotimi and Muazu (2018). It is an indication that Nigeria's rapid population growth will not result in the sustainable economic development of the country. What this portends for the country is that with a population growth greater than the economic growth rate there is pressure on available resources. These results in undue pressure for survival that has seen the country witness increasing unemployment, vices, restiveness and insurgency. The coefficient of foreign direct investment is positive and significant on the human development index in both the short run and long run. This is in agreement with the study of Arshad (2019). This may not be unconnected to the fact that Nigeria is listed amongst the countries with the highest inflow of foreign direct investment in Africa. This can help the country provide the necessary level of infrastructure that will tackle unemployment and improve the standard of living in the country.

The sign of remittance is negative and significant but did not conform to a priori expectation and the study by Anetor (2019).For the past two decades, remittances have become a significant contributor to the gross domestic product of the country, and this is mostly directed at households that may have used quite a good chunk of it for consumption expenditure. The coefficient of the effective governance index is positive and significant in both the short and the long run as expected by theoretical expectations. Although the same result was reported in the study by Olakunle (2019), it is at variance with the opinion of many stakeholders such as transparency international and the study by Salawu et al (2018) who stated that governance is a major constraint to sustainable economic development in the country.

Gross Domestic Product exerts a negative and significant effect on Human Development Index in both the short run and long run. This is in line with the theoretical postulation of the study. It is not surprising as the country since 2011 has been witnessing slow growth in the gross domestic product in the face of increasing population. Abdullah et al (2015) reported the same result. So, sustainable human development may not be achieved in the country. The signs of the Unemployment rate did not conform to a priori expectation in the short run as it exerts a positive and significant effect on the human development index. But it did conform to a priori expectation and the study by (Onyeoma, 2020). This is not unexpected as a major constraint to economic

growth is unemployment, and when this occurs in the face of a rapidly growing young population there are bound to be constraints to sustainable economic development.

The error correction parameter conforms to a priori expectation and is statistically significant. The magnitude of the cointegration term indicates that if there is any deviation, the long-run equilibrium is adjusted moderately where about 46% of the disequilibrium may be removed in each period. This shows that the speed of adjustment to where the Human Development Index will equilibrate even when there is initial disequilibrium is at the rate of 46%.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Having examined the effect of rapid population growth on the Human Development Index in Nigeria, the conclusion is that POP, REM, GDP, and UEM negatively and significantly affect Human Development Index in Nigeria, while FDI and EGI exert a positive and significant effect. So, the study concludes that Nigeria with a rapidly growing young population in the face of a slow economic growth that grows less than the population growth rate is aggravated by a high level of youth unemployment that has seen the country awash with different levels of agitations. In general, the adverse consequences of these parameters will make Nigeria not achieve economic sustainability. Based on these realities, for Nigeria to achieve economic sustainability in the face of the prevailing rapid population growth rate, the study makes the following recommendations;

1. Nigeria must control its rapidly growing population by formulating and implementing population and economic policies that are supportive of societal welfare.
2. Economic growth must be made all-inclusive in Nigeria.
3. Remittances should be channelled to investment consumption and human capital development, instead of the present consumption expenditure.
4. The high rate of youth employment in Nigeria should be checked by developing skills set through quality education, improved health care, and vocational training for the youths.

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APPENDIX 1

Table 1: Definition, Measurement, A priori and Justification of Variables

Variable	Variable Definition	Unit of Measure	A priori	Justification
HUMAN DEVELOPMENT INDEX (HDI)	Human Development Index	index	Dependent variable	A key United Nations human development measure that encompasses health, education and standard of living.
POPULATION GROWTH RATE (POP)	Population Growth Rate	Rate	-	It is a measure of the economic development of a country, especially when

				measured against the economic growth rate.
REAL GROSS DOMESTIC PRODUCT (GDP)	Real Gross Domestic Product	Rate	+	This is the value of the Goods and Services produced in the country after correcting for inflation.
FOREIGN DIRECT INVESTMENT (FDI)	Foreign Direct Investment	% of GDP	+	foreign direct investment is the investment inflow from external sources to the country and this is a veritable source of funding that drives sustainable economic development
REMITTANCE (REM)	Remittances from abroad	% of GDP	+	This is the transfer of funds from Nigerian citizens living in the diaspora. It has become a very important source of financing for sustainable economic development in the country.
EFFECTIVE GOVERNANCE INDEX (EGI)	Effective Governance Index	index	+	this has to do with governance and the distribution of available resources within the economy. Where it is not effective there is widespread poverty, inequality, and unemployment that leads to unsustainable economic development.
UNEMPLOYMENT (UEM)	Unemployment rate	Rate	+	This is a constraint to sustainable economic development. It hinders production, income and economic growth in the country. It can also trigger unfavourable consequences on the economy.

Author's compilation (2021)