Impact Of Population Growth and Poverty on Standard of Living in Nigeria

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Abstract
The study examines empirically the impact of population growth and poverty on standard of living in Nigeria from 1981 to 2023. The dimensions that were used to proxy the independent variables are population growth rate and poverty rate while gross national income per capita was used to proxy standard of living which is the dependent variable. The independent variables – population growth (was disaggregated into rural and urban population growth rate) and poverty rate. Data used were sourced from secondary sources which includes; World Bank development indicators for various years and the Central Bank of Nigeria annual statistical bulletin. The Statistical Software employed to analyse the data was the eviews9. The data collected were analyzed using the econometrics technique of Autoregressive Distributed Lags. The result indicated that population growth and poverty rate have effect on standard of living. The study therefore concludes that population growth rate and poverty reduce economic development in Nigeria within the period of study. The study therefore recommends that policies that would improve the share of working age population in the country in order to improve economic growth which in turn will improve standard of living should be encouraged especially in the rural areas. At micro level, households especially in the rural areas should also focus on children capacity building by ensuring children are well educated and trained across the endeavors of human life as this will alleviate poverty and brings about improvement in standard of living.

Key words: Population growth, Poverty, Standard of living, Nigeria

INTRODUCTION

Since independence in 1960, Nigeria is known to be the most populous country in Africa. However, the significant increase in population growth in the country has led to unemployment, lack of basic health care facility, inadequate infrastructure and poverty (IMF, 2013). The Nigerian economy improved significantly at an annual average of 6 percent over the last ten years despite the impact of the global financial crises that affected most developed countries negatively (Arndt, et al. 2016). Poverty persisted from 42.7 percent in 1992 to 65.6 percent in 1996 and 69 percent in 2010 notwithstanding the positive growth experienced, based on the data provided by the National bureau of Statistics (NBS, 2012). This is indicative of the fact that population growth in Nigeria has impacted negatively on employment opportunities, access to health care facilities, education from primary to tertiary institution and other infrastructural benefits.

The ten known most populous countries in the world are; China, India, United States, Indonesia, Brazil, Pakistan, Nigeria, Bangladesh, Russia and Mexico (World Population, 2021). This suggests that Nigeria is the 7th most populous country in the world but population growth has not been to the nation's advantage and has also led to unemployment rate hitting 30.7 percent (NBS, 2021). The health of an economy is determined by its gross domestic product (GDP) and other key economic indicators. A country with good infrastructure, improves literacy amongst the populace, unrestricted access to health care, standard of living, poverty reduction and other parameters which are elements of economic development. It is against this background that this study is set to investigate the impact of population growth and poverty on standard of living in Nigeria.

Population growth has remained the most controversial issue in global development debate in history and in recent times. According to the pessimists' school of thought, population growth negatively affects economic growth and development to the extent that population growth, be it by natural growth or (net) immigration, puts pressure on the natural resources and the environment (Mamingi & Perch, 2013). This pressure hampers economic growth and development (Yeboah, et al. 2001). The pessimists also emphasized that population growth worsen income inequality and decrease in quality of life. On the contrary, the optimists' school of thought considers population growth a bonus for economic growth and development. Indeed, by increasing mass production and specialization, population growth gives rise to improved human capital which facilitates technological advancements which leads to economic expansion (Klasen & Nestmann, 2006). Another group, the mitigated view is held by the revisionists or neutralists school of thought. They believe that there is little evidence which indicates that population growth and economic growth is linked (Bloom, et al. 2003). The combination of these factors provoked many questions than answers and further stimulates the need for this study. What is the trend of population growth in Nigeria? What effect does population growth have on poverty and standard of living in Nigeria? These are the issues this article is set up to address. The effect which population growth and poverty have on standard of living in Nigeria is the issue which this work seeks to address.

LITERATURE REVIEW

Conceptual Clarification

Population Growth: It took hundreds of thousands of years for the world population to grow to 1 billion – then in just another 200 years or so, it grew sevenfold. In 2011, the global population reached the 7 billion marks, it stands at almost 7.9 billion in 2021. Population growth is the increase in the number of individuals in a population. Global human population growth amounts to around 83 million annually (World Population Prospects, 2017) or 1.1% per year. The global population has grown from 1 billion in 1800 to 7.8 billion (World Population Prospects, 2017). It is expected to keep growing, and estimates have put the total population at 8.6 billion by mid-2030, 9.8 billion by mid-2050 and 11.2 billion by 2100 (World Population Prospects, 2017). Many nations with rapid population growth have low standards of living, whereas many nations with low rates of population growth have high standards of living (World Population Prospects, 2017).

The "population growth rate" is the rate at which the number of individuals in a population increases in a given time period, expressed as a fraction of the initial population. Specifically, population growth rate refers to the change in population over a unit time period, often expressed as a percentage of the number of individuals in the population at the beginning of that period. This can be written as the formula, valid for a sufficiently small time interval:

$$population\ growth = \frac{p(t_2) - p(t_1)}{p(t_1)(t_2 - t_1)}$$

A positive growth rate indicates that the population is increasing, while a negative growth rate indicates that the population is decreasing. A growth ratio of zero indicates that there were the same number of individuals at the beginning and end of the period—a growth rate may be zero even when there are significant changes in the birth rates, death rates, immigration rates, and age distribution between the two times.

Below is a careful review of Nigeria's population growth rate:

a)   The population of Nigeria in 2023 was 223,804,632, a 2.41% increase from 2022
b)   The population of Nigeria in 2022 was 218,541,212, a 2.41% increase from 2021
c)   The population of Nigeria in 2021 was 213,401,323, a 2.44% increase from 2020
d)   The population of Nigeria in 2020 was 208,327,405, a 2.47% increase from 2019
e)   The population of Nigeria in 2019 was 203,304,492, a 2.48% increase from 2018. (Macro trends, 2024).

Poverty

According to the United Nations Statistical Division (UNSD, 2015) the earliest definitions of poverty centered on the inability to obtain adequate food and other basic necessities, the contemporary focus continues to be on material deprivations, i.e., the failure to command private resources. The World Bank Report (1990) and Aigbokhan (2010) considered poverty simply as the inability to achieve a certain minimal standard of living. But standard of living in itself is determined by several factors of which income is chief. This presupposes that defining poverty in terms of standard of living is invariably defining it in terms of income.

Also, Aluko cited in Asinobi (2013) referred to poverty as a lack of command over basic consumption needs. That means the poor have inadequate level of consumption giving rise to insufficient food, clothing and/or shelter, and moreover the lack of certain capacities, such as being able to participate with dignity in society.

Standard of Living (Gross National Income per capita)

The standard of living of a country is mainly measured by gross national income (GNI) per capita (formerly GNP per capita). GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary

income (compensation of employees and property income) from abroad. GNI, calculated in national currency, is usually converted to U.S. dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate actually applied in international transactions. To smooth fluctuations in prices and exchange rates, a special Atlas method of conversion is used by the World Bank (Index Mundi, 2019).

Gross national income (GNI) per capita is the dollar value of a country's final output of goods and services in a year, divided by its population. It reflects the average income of a country's citizens. Countries with a GNI per capita in 1998 of $9,361 or more are described as high income, between $761 and $9,360 as middle income, and $760 or less as low income.

Theoretical Literature Review

Optimum Theory of Population

The optimum theory of population was propounded by Edwin Cannan in his book Wealth published in 1924 and popularized by Robbins, Dalton and Carr-Saunders. Unlike the Malthusian theory, the optimum theory does not establish relationship between population growth and food supply. Rather, it is concerned with the relation between the size of population and production of wealth (Ayesha, 2014).

The Malthusian theory is a general theory which studies the population problem of a country in keeping with its economic conditions. Thus the optimum theory is more realistic than the Malthusian theory of population. Like the Malthusian theory, the optimum theory of population has some assumptions such as;

i.   The natural resources of a country are given at a point of time but they change over time.

ii.   There is no change in techniques of production.

iii.   The stock of capital remains constant.

iv.   The habits and tastes of the people do not change.

v.   The ratio of working population to total population remains constant even with the growth of population.

vi.   Working hours of labor do not change.

Empirical Literature Review

Nwosu, et al. (2014) examined the effects of population growth on economic growth in Nigeria with time series and use of linear model to analyses economic growth fluctuations vis-a-vis

population growth from 1960 to 2008. The use of augmented dickey fuller (ADF) stationary tests combined with Granger causality and cointegration tests gives result that population growth has a significant impact on economic growth and also there is a sustainable long run equilibrium relationship between economic growth and population growth and an evidence of unidirectional causality between population growth and economic growth.

Lawanson (2016) examined rapid population growth and economic development in Nigeria. The study shows that the recent population growth in all regions of the world is the consequence not of increased birth rates per se, but of unprecedented worldwide decrease in the death rate in most case in developed economies. And emphasized that population of most LDC's are generally characterized by high dependency ratio, high urbanization, low income per capita and serious environmental problems caused as a result of urban congestion and pollution.

Aidi, et al. (2016) examined the relationship between population dynamics and economic growth in Nigeria using time series data from 1970 to 2014. Ordinary least square was used to analyze the data. The study used fertility, mortality and net –migration as core variables. It was further revealed that gross fixed capital formation (GFCF). He believed savings are strong drivers of economic growth in Nigeria. It was recommended that Nigeria government make direct efforts toward checking the alarming fertility rate in Nigeria and efforts toward checking the alarming fertility rate in Nigeria and with substantial investment in education and skills acquisition programs so as to improve productivity in Nigeria.

Sakiru, et al. (2017) studied the dynamics of population and economic growth in Nigeria using Statistical Bulletin from 1970 to 2014. With the help of ADF test the study found that the two series were only difference stationary and Johansen co-integration test revealed that both variables had long –run relationship. VECM revealed that economic growth adjusts to its long –run equilibrium. Olusogo and Oluwarotimi (2018) studied population growth and economic growth in Nigeria: An appraisal from 1981 to 2015 with the use of ordinary least squares regression to analyze the data from 1981 to 2015 with the use of ordinary least square regression to analyze the data. Population growth has positive and significant effect on economic growth of Nigeria and fertility is of negative impacted but significant to economic growth.

Ademola (2019) investigated empirically the demographic dividend-growth nexus in the Nigerian economy from 1970 to 2017 using a multivariate VAR modeling technique. The study found that the innovation in gross enrollment made much contribution to the variation in economic growth relative to innovation in economic support ratio. This result, thus, lend credence to the theoretical view of the education-triggered dividend model which ascribes to education twofold roles of helping to lessen fertility and also enhancing productivity but invalidates the conventional dividend paradigm.

Ojo (2021) examined the link between population growth and poverty rates in the developing countries of Africa. Poverty in Africa is a growing menace to standard of living and economic wellbeing of the people and this is visible and concentrated in fewer countries than others. Five of the ten poorest countries in the world are in Africa, and of the top ten countries, three are African countries. The average per capita income of these countries is the least in the world, which is an indicator of the standard of living.

METHODOLOGY

Research Design

The study adopted the Ex-post facto research design to examine the relationship between population growth, poverty and economic development in Nigeria. Ex-post facto study or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher. Here the effect of two or more independent variable is investigated. This method allows the researcher to determine the effects of independent variables and also whether they interact in some way as they influence the dependent variable. The present study adopted the Ex-post facto research design because the fact has already occurred, and secondly it involves the investigation of the effects of two or more independent variables on the dependent variable.

Model Specification

GNI = f(RPOGR, UPOGR, PVR)   3.6

GNI = Gross national income per capita

RPOGR = Rural population growth rate

UPOGR = Urban population growth rate

PVR = poverty rate

For the purpose of estimation, it is necessary to re-write the model in the form of equation as;

$$GNI = \beta_0 + \beta_1 RPOGR_t + \beta_2 UPOGR + \beta_3 PVR_t + \mu_{1t} \qquad\qquad 3.7$$

Where: GPC = Gross National Income Per Capital a proxy for standard of living

β_0 = Constant term

β_1, β_2, β_3 = the coefficient of rural population growth, urban population growth and poverty rate to be determined.

μ_{1t} = error or stochastic term.

β_1, β_2, > 0 $\beta_3 < 0$ = the apriori expectation.

Empirical Results and Discussions

Table 1. Augmented Dickey Fuller Test

Variable	ADF				I(.)
	Level		1st Diff		
	Coeff.	5% CV	Coeff.	5% CV	
RPOGR	-2.116	-3.524	-6.505	-3.527	I(1)
UPOGR	-9.729	-3.558	-	-	I(0)
POVR	-3.033	-3.524	-6.652	-3.530	I(1)
GNI	-2.072	-3.537	-4.365	-3.527	I(1)

Source: Author's computation using E-views 9

Table 1, shows the Augmented Dickey Fuller. Going by the preposition of Jenkin and Box (1970), the Variables that are not stationary at levels shall be made stationary after first difference. GNI per capita, Rural population growth rate and poverty rate were stationary after first difference while Urban population growth rate was stationary at level.

Table 2. Bound Test

ARDL Bounds Test

Date: 08/09/24   Time: 11:37

Sample: 1982 2022

Included observations: 41

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	6.052834	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound

10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Author's computation using E-views 9

The bound test cointegration result presented in Table 2, shows that the calculated F-statistic value of 6.05284 is greater than the theoretical critical value of 4.35 for the upper bound I(1) at 5 percent level. This means that there is a co-integration; hence, a long run relationship exists between Rural population growth rate (RPGR), Urban population growth rate (UPGR) Poverty rate (POVR) and Gross national income per capital (GNI) within the study period. Since there is existence of long run relationship among the variables, both short run and long run estimate of the model was conducted using the ARDL approach.

Table 3. Long run results of GNI Model

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POVR	0.001291	0.004035	0.319970	0.7508
RPOGR	-0.891949	0.125297	-7.118656	0.0000
UPOGR	-0.053108	0.065691	-0.808454	0.4241
C	13.833907	0.420507	32.898127	0.0000

Source: Author's computation using E-views 9

Table 3, presents the long run result of the gross national income per capita (GNI). The result reveals that PVT and UPGR are not statistically significant in predicting changes in GNI but the coefficient of rural population growth rate is statistically significant in predicting changes in GNI. In other words, the independent variables of poverty rate and urban population growth rate exert insignificant impact on GNI. Meanwhile, PVT and UPGR were positive but insignificant at 5% level of significance with probability values of 0.7508 and 0.4241 respectively and therefore, do

not significantly explain the changes in GNI for the period under review. But rural population growth rate (RPGR) is negatively signed and statistically significant with a probability value of 0.0000 at 5% level of significance. It thus means, a unit increase in the coefficient of rural population growth rate will reduce the gross national income per capita by -0.053108 in the long run. It means that increase in rural population growth rate will reduce gross national income per capita (standard of living). The reason that may be adduced for this development is the fact that the population in the rural areas contribute little or nothing to the gross national income because of the subsistence agriculture practiced in the rural areas.

Table 4. Short run and ECM results of GNI Model

ARDL Cointegrating And Long Run Form

Dependent Variable: LOG(GNI)

Selected Model: ARDL(1, 0, 0, 0)

Date: 08/09/24   Time: 11:40

Sample: 1981 2022

Included observations: 41

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POVR)	0.000267	0.000787	0.339408	0.7363
D(RPOGR)	-0.184596	0.046280	-3.988630	0.0003
D(UPOGR)	-0.010991	0.015111	-0.727343	0.4717
CointEq(-1)	-0.206958	0.062669	-3.302382	0.0022

Cointeq = LOG(GNI) - (0.0013*POVR   -0.8919*RPOGR   -0.0531*UPOGR +

13.8339)

R-squared	0.974949	Mean dependent var	12.44016
Adjusted R-squared	0.972166	S.D. dependent var	0.250864
S.E. of regression	0.041853	Akaike info criterion	-3.395445
Sum squared resid	0.063061	Schwarz criterion	-3.186473
Log likelihood	74.60662	Hannan-Quinn criter.	-3.319349
F-statistic	350.2689	Durbin-Watson stat	1.940773
Prob(F-statistic)	0.000000		

Source: Author's computation using E-views 9

Table 4. shows that the calculated Adjusted-R square is 0.972166, indicating that the regressors in the model account for approximately 97.2 percent of the total fluctuation in GNI. The remaining 2.8 percent are accounted for by forces which are exogenous to the model but covered by the stochastic term. Also, the result validated the entire regression model to be of good fit. The F-statistics of 350.2689 with a probability value of 0.000000 which is less than 5% ($P<0.05$) level of significance, indicated that the model is properly specified. The result of the error correction model (CoinEq(-1)) is well specified and the diagnostic statistics are good. The ECM variable has the correct apriori sign and also statistically significant. The speed of adjustment of -0.206958 shows the level of convergence of the variables. In particular, about 20.6 percent of disequilibrium or deviation from long run of GNI in the previous period is corrected in the current year, since the data employed are yearly data. Also, the Durbin Watson statistics value was 1.940773, meaning that there is relative absence of serial autocorrelation in the model.

The result shows that in the short run, the coefficients of poverty rate and urban population growth rate are not statistically significant in predicting changes in GNI but the coefficient of rural population growth rate is statistically significant in predicting changes in GNI. The coefficient of rural population growth rate (RPOGR) was -0.184596 with a probability value of 0.0003 which is less than 5%. The implication is that a unit increase in rural population growth rate (RPOGR) coefficient will reduce GNI by 18.4% percent. It thus means that increase in the rural population growth rate will reduce gross national income per capita in the short run in Nigeria all things being equal.

Residual Diagnostics Test for GNI Model

Breusch-Godfrey Serial Correlation LM Test:

|			
F-statistic	2.904169	Prob. F(2,34)	0.0685
Obs*R-squared	5.982211	Prob. Chi-Square(2)	0.0502

Source: Author's computation using E-views 9

The null hypothesis states that there is no serial correlation. Since each of the F-statistics probability value is greater than five percentage we cannot reject the null hypothesis of no serial correlation. It means that the result is good.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.298549	Prob. F(4,36)	0.2890
Obs*R-squared	5.169710	Prob. Chi-Square(4)	0.2703
Scaled explained SS	3.148491	Prob. Chi-Square(4)	0.5333

Source: Author's computation using E-views 9

The null hypothesis states that there is no heteroskedasticity. Since each of the F-statistics probability value is greater than five percentage we cannot reject the null hypothesis of no heteroskedasticity. It thus means that the result of the model can be taken seriously, that is, the result is good.

Diagnostic Testing of GNI Model
The diagnostic test is conducted to determine if the series fulfill the assumption of normality of distribution, autocorrelation (Breusch-Godfrey Serial Correlation LM Test) and heteroscedasticity (Breusch-Pegan-Godfrey Test). The result of the diagnostic test is presented below.

Normality Test
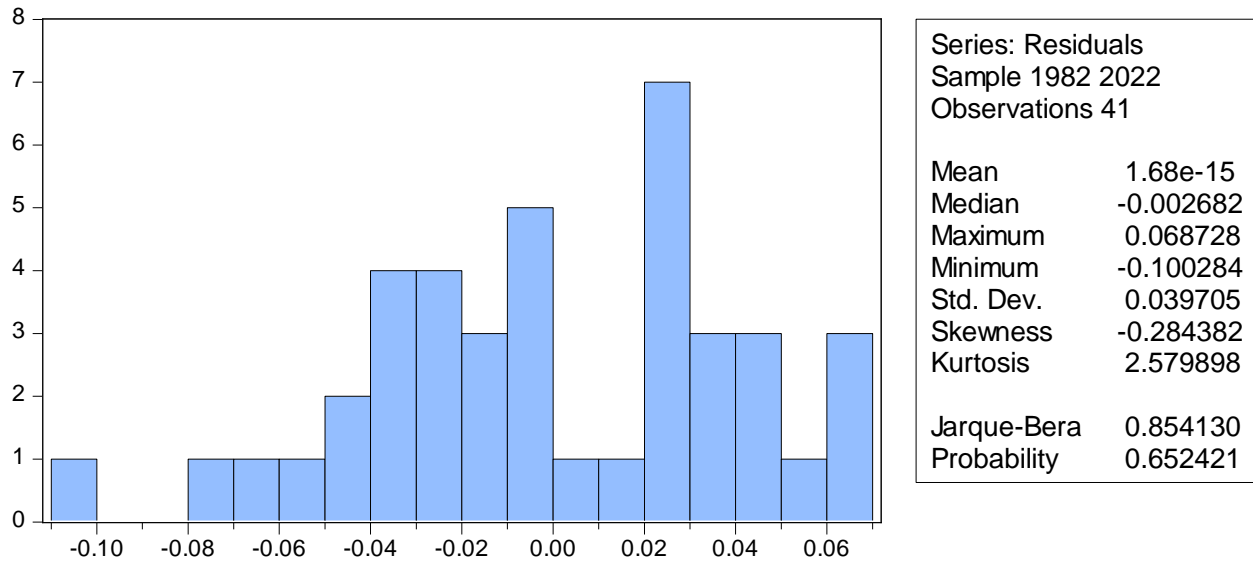
Source: Author's computation using E-views 9

Normality test is essential to ascertain the distribution of the data set in the model. It could be seen from the figure of the normality test above that the null hypothesis that the variables are normally distributed cannot be rejected since the probability value of Jarque-Bera is greater than 0.05, at 0.652421 probability value. This means that the residuals are normally distributed and has not violated the assumption of normality.

Stability Tests for GNI Model

The test is meant to test the appropriateness and stability of the estimated ECM model. This is to check if the coefficient of the model is stable and can be used for prediction. The stability test was conducted using the cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ) tests. If the plot of the CUSUM and CUSUMSQ for the model lies within the 5 percent critical bound it is suggestive that the model is stable. From our results, the model is stable.
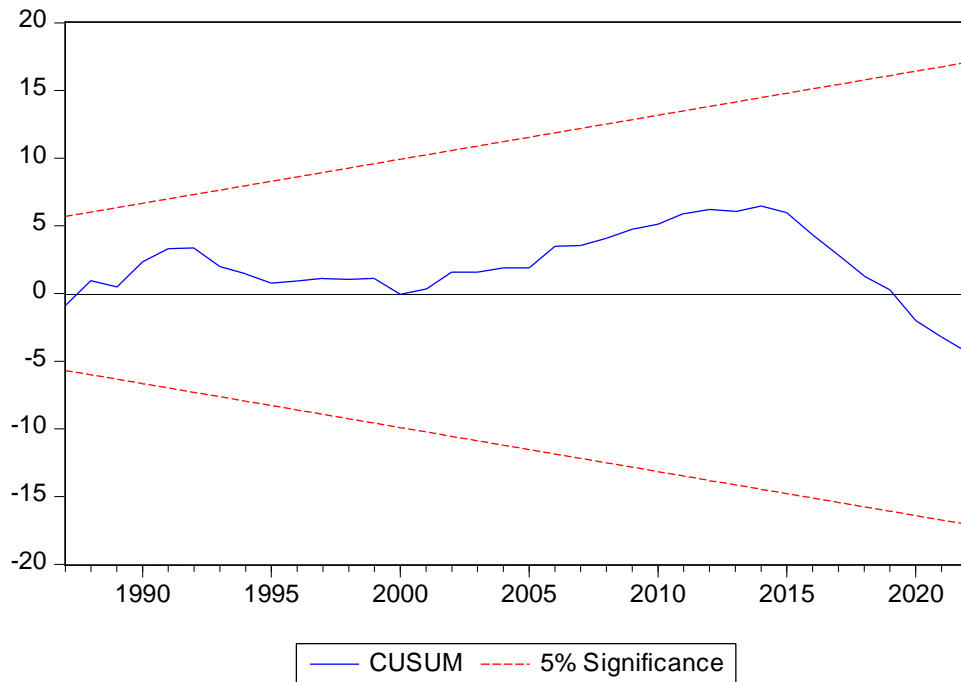
Source: Author's computation using from E-views 9

Cumulative sum for LOG(GNI) Model
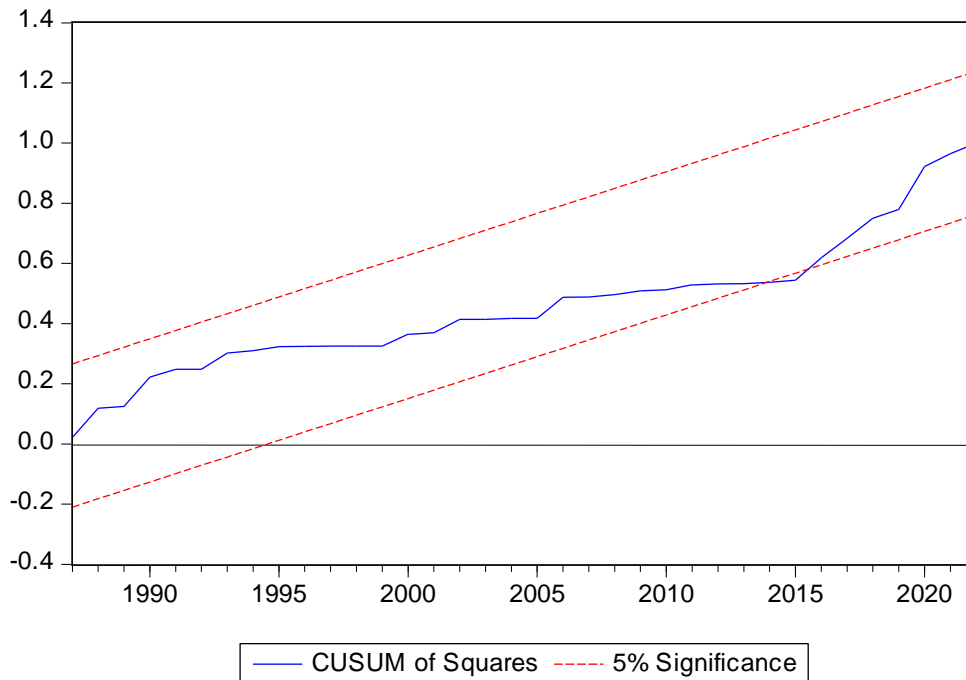
Source: Author's computation using from E-views 9

Cumulative sum of square for LOG (GNI) Model

Conclusion/Recommendations

Population growth in less developed countries like Nigeria is linked to many problems, including poverty, hunger, high infant mortality and inadequate social services and infrastructure (transportation, communication etc.) Population growth may intensify the rate of poverty which may in turn affect savings and investment. Poor savings and investment affect economic development while economic development in turn affects the population growth. This is an indication that population growth, poverty and economic development are linked. This study is to further explore the linkage between population growth, poverty and standard of living in the Nigerian context. The study findings indicated that a long-run and short-run relationships exist among the variables, the independent variable of rural population growth rate has statistically significant impact on the dependent variable standard of living. It is therefore concluded that rural population growth rate has negative statistically significant impact on standard of living in Nigeria within the study period. The study therefore recommends that policies that would improve the share of working age population in the country in order to improve economic growth which in turn will improve standard of living should be encouraged especially in the rural areas. At micro level, households especially in the rural areas should also focus on children capacity building by ensuring

children are well educated and trained across the endeavors of human life as this will alleviate poverty and brings about improvement in standard of living.

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