ESTIMATING THE GROWTH EFFECTS OF POPULATION, POVERTY AND UNEMPLOYMENT IN NIGERIA

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ABSTRACT
This research study investigates the growth effects of population, poverty and unemployment in Nigeria from 1980 to 2018.It adopts the fully modified ordinary least square method (FMOLS) to estimate the long run coefficients of population, poverty and unemployment of economic growth. The empirical results show that that population growth rate has a positive but insignificant impact on economic growth in Nigeria. This implies the attribute of inept characteristics of the population that comprises majorly of unskilled and semi-skilled labour and in turn failed to contribute efficiently to productive capacity of the economy. Also, poverty rate has a positive and significant impact on per capita income. Further, unemployment has a significant negative impact on economic growth. The economic implication is that the level of economic growth worsened because those that are qualified and able to work cannot secure a job and contribute significantly to production processes. As regards causality test result, the study found that there is no feedback causality between population growth, poverty, unemployment and economic growth in Nigeria. There is need for government to beef-up the skill acquisitions programmes, vocational trainings and entrepreneurship development in order to ensure that the growing population is equipped with relevant skills that contribute significantly to economic activities.

Keywords: Population, Poverty, Fertility, Economic Development, FMOLS.
JEL Classification: I30, J10, J13, O10.

1. INTRODUCTION
Nigeria continues to pursue mitigation of the misery of poverty, attainment of sustainable economic growth and development as it is blessed with human, natural and mineral resources. The population of Nigeria has been growing astronomically over the years. The country's population rises from 16.60 million in 1911 to 30.42 million in 1953; it increases further to 89 million in 1991, 170 million in 2014, and over 200 million in 2020 (World Bank, 2020). This has brought the country into limelight as it is tagged the 'giant of Africa' being the most populated country in the Africa continent (World Bank, 2014). With an estimated population of 200 million ranked that is 7th in the world and a growth rate of 2.58%, it is projected that the population will almost double in 2050 with a growth rate of 1.93% (United Nations World Population Prospects, 2020). Although the country is richly endowed in terms of human and natural resources, the benefits of these resources remains a mirage and paradox to her economic development as it has not been able to harness full potential of the resources.
Few decades ago, the agricultural sector was the main source of livelihood and export earnings and population growth rate was linked to productive activities. According to Tartiyus, Dauda and Peter (2015), it was believed that increased productivity was a result of greater number of workers or labourers working efficiently and contributing to the overall economic output of the nation. Therefore, Nigeria's population growth witnessed a surge before and after independence. It has

been argued that the annual growth rate of the population in the country has skyrocketed from the 1950s through the 1980s. An estimate of 2% population growth rate was recorded by the government between 1953 and 1962. However, between 1965 and 1973, the World Bank estimated Nigeria's growth rate at 2.5%, increasing to 2.7% between 1973 and 1983 (World Bank, 2014).

Furthermore, Bloom and Canning (2001) posits the emergence of poverty trap and high unemployment through the interaction of economic growth with population dynamics. Therefore, economists have conceptualized the poor as the segment of the population that is unable to meet or satisfy basic nutritional needs (Reutlinger and Selowsky, 1976; Ojha, 1970), others like Singer (1975) view poverty partly as a function of education and/or health: life expectancy, child mortality rate among others. On the other hand, others have a wider perspective on poverty as inability to meet "basic needs"- physical (food, health care, education, shelter, and etc.) and non-physical (participation, identity, and etc.) requirements for leading a "meaningful life" (Streeton, 1979; Blackwood and Lynch, 1994). Undoubtedly, abject poverty has eaten deep into the fabric of the society for five decades despite the economic boom of the 1970s in Nigeria (Mohammed-Hashim, 2008; Obi, 2007; Anyanwu, 1997) as the country's growth is simply tagged a jobless growth (Maku and Alimi, 2018).

Evidence has shown the level of abject poverty in Nigeria following the collapse of crude oil prices between 2014 and 2016 alongside negative shocks, the gross domestic product (GDP) growth rate declined to 2.7% in 2015. In the wake of 2016, the economy plunges into its first recession in 25 years as it shrinks by 1.6%. Hence, poverty stands at 33.1% in Africa's largest economy. For a country endowed with great wealth in terms of human and natural resources to support commercial activities the level of poverty remains appalling. In 2018, the rate of population growth is higher than economic growth rate culminating into slow rise in poverty. Likewise, World Bank (2018) reports that almost half of the Nigerian population lives below the global poverty line of $2 per day with attending unemployment rate at 23.1%.

Over the years, various poverty alleviation programmes have been implemented by different regimes in Nigeria. Some of the questions that arise are: have these programmes been able to reduce poverty and unemployment? Does population growth worsen or boost economic growth? In the light of this, studies such as Ogunleye (2018), Aidi, *et al*. (2016), Dao (2013), Furuoka (2009) have found diverging results as some posit that population growth has a positive influence on economic growth while others have contrary results. In addition, studies by Nansadiqa *et al*.(2019), Omoniyi(2018), Bakare (2014), Bello and Roslan (2010), Ajibefun and Daramola (2003) have shown converging results concerning whether increase economic growth has trickle down to poverty reduction in Nigeria and other countries. However, few studies have investigated the tripartite effects of population growth, poverty and unemployment on economic growth especially the direction of causal relationship in Nigeria. It is against this background that this study investigates the effects of population, poverty and unemployment on economic growth in Nigeria between 1980 and 2018. It also examines the direction of causal relationship among population growth, poverty, unemployment and economic growth making it to stand out among other studies.

Aside the introductory section, this paper is further divided into four sections. Section 2 provides brief literature review; section 3 anchors the methodology and data sources; section 4 presents the discussion of empirical results; while section 5 concludes with policy implications.

2. LITERATURE REVIEW

2.1 Conceptual Issues

Population refers to the number of people in a single district, whether it is a city or town, region, country, continent, or the world. The central authority typically quantifies the size of the resident population within their jurisdiction using a census, a process of collecting, analyzing, compiling, and publishing data regarding a population. As for poverty, it is defined as a condition in which an individual or group of individuals, or community lacks the financial resources and essentials for a minimum standard of living. It is also the state of a person who lacks a usual or socially acceptable amount of money or material possessions. Poverty exists when a person lacks the means to satisfy his/her basic needs. For instance, poverty has been linked with poor health, low levels of education or skills, an inability or an unwillingness to work, high rates of disruptive or disorderly behaviour, and improvidence. Unemployment, according to the Organisation for Economic Co-operation and Development (2020), is defined as the total number of people that are above the working age who are not in paid employment or self-employment but currently available for work during a specific period. Unemployment is proxy by the rate of unemployment which entails the number of people who are unemployed as a percentage of the labour force.

2.2 Theoretical Review

The theoretical root of this study is the work of Rev. Thomas Robert Malthus in his famous essay titled *Principle of Population* in 1798 modified in 1803. Malthus observed that by nature human food increases in an arithmetic progression while man himself increases in a rapid geometric progression hence outshooting the means of subsistence and survival unless being curbed by powerful preventive checks, such as celibacy, late marriage coupled with fewer children per family (Chand, 2017; Seth, 2017) or positive checks such as war, famine and disease will prevail. Malthus proposes that the size of the population is determined by the availability of the means of subsistence that is, food. Therefore, checks of death rooted in food scarcity and poverty will forestall possible population explosion.

However, Malthusian theory of population has been subjected to controversy and criticism as the theory has been proved wrong in developed countries in the 20th century due to improvement in medicine which has led to the fall in mortality rate (Ewugi and Yakubu, 2012). It has been observed that as against Malthus' projection of population explosion, this has been curtailed, and there has been increase in food production owing to improvement in technology thereby improving the people's living standards. Also, Malthus proposition of diminishing returns in land and agriculture has been criticized as there has been improvement in agricultural production with the use of fertilizers, pesticides and agricultural machineries. More so, there is no basis for the mathematical rate of growth of food production and population as proposed by Malthus. Furthermore, the theory has been criticized based on the proposition of Malthus that people will only bare minimum living standards. It has been revealed that the living standards of people in Western world have risen above the subsistence level.

2.3 Empirical Review

On the empirical front, studies have been conducted on the impact of population growth and poverty level on economic development but for the sake of this study, the impact will be disaggregated in order to review each variable's influence on economic development. The searchlight on the effect of population growth on economic development is beamed on Garza-Rodriguez, et al. (2016) who analyzed the dynamic relationship between population growth and

economic growth from 1960 to 2014 using vector error correction model (VECM). The result shows that in the short-run, economic growth has a negative effect on population, while in the long run, population has a positive influence on per capita GDP and per capita GDP has significant positive effect on population. Moshen and Chua (2015) examined the effects of trade openness, investment and population on economic growth in Syria between 1980 and 2010 applying a cointegration and Granger causality test. The study finds a bidirectional short-run causality relationship between trade openness, investment, population and gross domestic product. The result indicates that population has huge effect on the GDP.

Mahmud (2015) examined population growth and economic development in India between 1980 and 2013 using vector error correction model (VECM) and applying Granger causality test. Findingthe short run influence of population, rate of urbanization and employment on GDP using Wald test, the result indicates that each exogenous variable influence the endogenous variable. The study also reveals that a unidirectional causality runs from GDP to population growth and a positive relationship exists between population growth and economic growth in the long-run. Shahjaha *et al*. (2015) investigated the effect of population growth on economic development in Bangladesh between 1981 and 2014 using ordinary least squares method and found that population growth has a negative and significant impact on economic development. In addition, Kotani and Kotani (2012) investigated the effect of net migration on population growth in Indonesia from 1993 to 2005 using ordinary least square techniques. Findings revealed that lagged fertility does not affect economic growth although, a significant negative relationship exist between population growth and economic growth. Furuoka (2009), who examined population growth and economic development in Thailand between 1961 and 2003 using an unrestricted error correction model finds that population growth has a positive impact on economic development for the period. Similarly, Dao (2013) conducted a study on population and economic growth in 45 selected African countries between the period of 1990 to 2008 using ordinary least square and finds that the impact of population growth on per capita GDP was linear and negative and fertility rate has a negative and significant impact on per capita GDP.

Evidences from Nigeria are mixed. For instance, Ogunleye *et al*. (2018) investigated population growth and economic growth in Nigeria between the period of 1981 and 2015 by adopting the ordinary least square method and find that population growth is positive and has significant impact on economic growth while fertility rate and crude death rate are negative but not significant. Likewise, Aidi *et al*. (2016) probed into population dynamics and economic growth in Nigeria between 1970 and 2014 using ordinary least square method and finds that fertility rate, mortality rate and net migration had negative and significant impact on real gross domestic product while gross fixed capital formation has a positive significant impact and savings has a negative and significant impact on economic growth. Okwori *et al*. (2015) empirically investigated the Malthusian population theory in Nigeria between 1982 and 2012 by adopting a vector error correction model (VECM) and the results show that population growth does not significantly impact economic development during the period. Also, Nwosu *et al*. (2014) investigated the effects of population growth on economic growth between 1960 and 2008 testing for direction of causality. It was found that unidirectional causality exists between population growth and economic growth.

Olabiyi (2014) examined the effects of population dynamics on economic growth in Nigeria from 1980 to 2010 by adopting a vector auto regressive (VAR) model using variables such as infant mortality rate, fertility rate, trade openness, government expenditure, real gross domestic product

and primary school enrolment. The result reveals that fertility rate has a significant negative impact on economic growth and a significant positive relationship between infant mortality rate and economic growth. In addition, Akintunde, *et al*. (2013) examined the nexus between population dynamics and economic growth in 35 selected Sub-Sahara African countries between 1975 and 2005 using both pooled OLS and dynamic panel techniques. The empirical result revealed that total fertility rate has negative impact on economic growth while life expectancy at birth was found to have a positive relationship with economic growth. In similar vein, Adewole (2012) probed into the effect of population on economic growth between 1981 and 2007 by adopting ordinary least square method and finds that population growth has significant positive impact on economic growth proxied by per capita income and real gross domestic product.

Agrawal (2008) investigated the relationship between economic growth and poverty alleviation in provinces of Kazakhstan Central Asia using panel data between 2000 and 2002 by adopting General Least Squares (GLS). The study reveals that provinces with higher growth rates achieved sharp decline in poverty level. This is supported by studies of Christiaensen, Demery and Patemostro (2003), Ravallion (2001), Dollar and Kraay (2000). On the other hand, Ncube*et al*. (2013) finds that income inequality reduced economic growth and increased poverty in the Middle East and North African (MENA) region while Okafor (2016) investigated economic growth, poverty and income inequality relationship in Nigeria between 1980 and 2014 using vector auto-regressive (VAR) model and finds that economic growth has no impact on poverty reduction for the period. Also, there was no causal relationship between economic growth and poverty for the period in Nigeria. Ukpong *et al*. (2013) examined the issues of poverty and population growth in Nigeria using ordinary least square method and find that population growth has a positive and significant impact on poverty and a positive and significant impact of GDP on poverty alleviation. Bakare (2014) carried out a study on the effect of poverty reduction on economic growth in Nigeria between 1980 and 2008 using error correction model (ECM). The study reveals that there is a positive and significant relationship between economic growth and poverty. From the divergences of methods applied and results found in reviewed literatures, it is apparent that a wide gap exists in the subject of discourse especially in Nigeria.

3. METHODOLOGY

This study makes use of annual time-series data covering the period of 1980-2018 gathered from the World Bank's World Development Indicators (WDI), National Bureau of Statistics (NBS) and Central Bank Statistical Bulletin (CBN). This study takes a cue from the works of Bakare (2014) and Furuoka (2009). Hence, the study modified the models to investigate the tripartite effects of population, poverty and unemployment on income per capita growth. It thus specifies the following three models as the first model examines the impact of population growth and unemployment on economic growth, the second model investigates the impact of poverty and unemployment on per capital income and the third model examines the tripartite influence of population growth, poverty and unemployment on economic growth. The definitional equations after modification are specified as follows:

$$gdppc_t = f(popgr_t, \inf_t, tfr_t, uemp_t) \quad (1)$$

$$gdppc_t = f(pov_t, \inf_t, tfr_t, uemp_t) \quad (2)$$

$$gdppc_t = f(popgr_t, pov_t, \inf_t, tfr_t, uemp_t) \quad (3)$$

Equations 1, 2 and 3 are written in their econometric forms as follow:

$$gdppc_t = \alpha_0 + \alpha_1 popgr_t + \alpha_2 \inf_t + \alpha_3 tfr_t + \alpha_4 uemp_t + e_t \quad (4)$$

$$gdppc_t = \beta_0 + \beta_1 pov_t + \beta_2 \inf_t + \beta_3 tfr_t + \beta_4 uemp_t + v_t \quad (5)$$

$$gdppc_t = \varphi_0 + \varphi_1 popgr_t + \varphi_2 pov_t + \varphi_3 \inf_t + \varphi_4 tfr_t + \varphi_5 uemp_t + \mu_t \quad (6)$$

Where; *gdppc* represents economic growth measured gross domestic product per capita; *popgr* is population growth, *pov* denotes poverty rate, *uemp* represents unemployment rate, *inf* denotes inflation rate, *tfr* is total fertility rate, $\alpha_0, \alpha_{1-4}, \beta_0, \beta_{1-4}, \varphi_0, \varphi_{1-4}$ are parameters, e, v, μ are error term and *t* is time dimension. Following theoretical a'priori expectation, population growth rate, poverty rate, inflation rate, total fertility rate and unemployment rate should be negatively related to economic growth.

Hence, this study applies the Fully Modified Ordinary Least Squares (FMOLS) to investigate the long-run relationship between population, poverty level, unemployment and economic growth in Nigeria. The Fully Modified Ordinary Least Squares (FMOLS) is credited to Phillips and Hansen (1990). It uses kernel estimators of the nuisance parameters that affect the asymptotic distribution of the OLS estimator (Shahbaz, 2009). It achieves asymptotic efficiency by modifying the least squares to account for serial correlation effects and tests for the endogeneity in the regressors that result from the existence of cointegrating relationships (Phillips and Hansen, 1990; Shahbaz, 2009). In order to utilize this technique in estimating long-run parameters, there must exist a long-run relationship among the variables and must be a set of I(1) variables. Thus, we have to establish the presence of unit root in the data by employing the Augmented Dickey Fuller (ADF) that is used to examine the degree of integration among the variables. According to Engle and Granger (1987), when all the variables under investigation are non-stationary at level that is I(0), but stationary at first difference that is I(1), this allows the use of Johansen cointegration technique. Hence, two variables are cointegrated if they have a long-term relationship between them (Shahbaz, 2009).

4. RESULTS AND DISCUSSION OF FINDINGS

The descriptive statistics are highlighted in Table 1. From the result, the average of GDP per capita growth rate is 0.0056, while the average of population growth rate is 0.0262. Moreover, the average level poverty rate and inflation rate are 53.763 and 19.110 while total fertility rate and unemployment rate assumes the average values of 6.1672 and 11.109 in Nigeria respectively. The result also shows that inflation rate exhibits the highest standard deviation across the time series.

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max.
gdppcg	39	0.0056	0.0532	-0.1545	0.1246
popgr	39	0.0262	0.0029	-0.0180	0.0324
pov	39	53.763	6.7548	40.200	66.900
inf	39	19.110	17.081	5.3880	72.836
tfr	39	6.1672	0.4040	5.3870	6.7830
unemp	39	11.109	7.8109	1.8000	27.400

Source: Author's Computation.

Before checking if series exhibit long-run relationship, the standard procedure is to examine their mean reversion properties. Therefore, this paper utilizes both the Augmented Dicky Fuller (ADF)

and Phillips-Perron unit root tests. The tests were estimated with both constant and trend terms of the series. Table 2 shows that we accept the null hypothesis of unit root in the series at their level form. However, it rejects the null hypothesis of unit root after integrating the series, implying stationarity at their first difference forms.

Table 2: Unit root Test

Variables	ADF		PP		Order of integration
	@ level	@ 1st Diff.	@ level	@ 1st Diff.	
gdppcg	-3.005	-11.6016[abc]	-4.1455	-21.3569[abc]	I(1)
popgr	-4.3037[abc]	-7.3037[abc]	-3.8984	-9.8974[abc]	I(1)
pov	-1.7547	6.5641[abc]	-1.6646	6.5758[abc]	I(1)
inf	-3.6720[abc]	-5.6651[abc]	-2.9566	-11.4670[abc]	I(1)
tfr	-1.2454	-4.0412[ab]	-1.4124	-5.7018[abc]	I(1)
unemp	-2.2060	-5.4318[abc]	-2.2060	-5.4246[abc]	I(1)

Note: [a , b] and [c] denote significance at 10%, 5 %, and 1 % respectively of the null hypothesis (H_0) for ADF and PP. The optimal lag order for Dickey and Fuller (1979) ADF test is determined by SIC, while the bandwidth for Phillips and Perron (1988) PP test is determined by using the Newey-West Bartlett kernel. We include both constant and trend in the estimation.
Source: Author's computation.

Afterward, the study analyses whether longrun relationship exists among the variables. The study therefore employed the Johansen (1988, 1991) and Johansen and Juselius (1990) cointegration tests and the results are presented in Table 3. When the relationship between the control variables, population growth, unemployment and economic growth were used (model 1), the result reveals that we reject the hypothesis of no cointegration in the equation. Also, when the relationship between the control variables, poverty rate, unemployment and economic growth were used (model 2), the result reveals that we reject the hypothesis of no cointegration in the equation. Further, when the relationship between the control variables, population growth, poverty rate, unemployment and economic growth were used, the result reveals that we reject the hypothesis of no cointegration in the equation (model 3, which is the baseline model). Hence, results (containing model 1-3) show an evidence of cointegrating relationship among the variables implying that poverty rate, population growth, and unemployment jointly exhibit long-run relationship with economic growth in Nigeria.

Table 3: Cointegration Results

(1)		(2)		(3)	
Trace Test	**Max. Eigenvalue**	**Trace Test**	**Max. Eigenvalue**	**Trace Test**	**Max. Eigenvalue**
195.4748[abc]	113.9007[abc]	168.5716[abc]	121.1149[abc]	227.8490[abc]	126.6645[abc]
81.5742[abc]	42.5559[abc]	47.4567[a]	24.7117	101.1845[abc]	47.7467[abc]
39.0183[abc]	26.3786[abc]	22.7450	9.2246	53.4378[ab]	27.0702[a]
12.6398	8.2506	13.5204[a]	8.0345	26.3677	11.5109
4.3892[ab]	4.3892[ab]	5.4859[ab]	5.4859[ab]	14.8568[a]	8.6676
-	-	-	-	6.1892[ab]	6.1892[ab]

Note: [a, b] and [c] denote significance at 10%, 5 %, and 1 % respectively. (1), (2), and (3) represents model 1, model 2, and model 3. For all model, at least one cointegrating relationship exist among the variables.

Source: Author's Computation

Table 4 reveals the long-run cointegrating effect size of the variables in models 1 to 3 using the FMOLS estimation. Specifically, an increase in population growth rate by 1 unit, inadequately

increases economic growth by 0.5645 (model 1) and 2.3852 (model 3) units. This implies the effect of population growth rate appears to be positive but not significant (both in models 1 and 3) in explaining the growth of the Nigerian economy. This is an offshoot of the dysfunctional characteristics of population that comprise mainly of unskilled and semi-skilled labour contributing weakly to the productive capacity of the economy. This is supported by the empirical findings of Okwori *et al*. (2015) but contrary to the results of Ogunleye *et al*. (2018) and Adewole (2012) which reveal that population has a significant positive impact on economic growth. Also, an increase in poverty rate by one unit inadequately increases economic growth by 0.0056 and 0.0051 units in models 2 and 3 respectively. Given the similarity in the size and significance, the study infers that the effect of poverty rate appears to be positive and significant (though with weak sizes both in models 2 and 3 in explaining the growth of the Nigerian economy which implies that increase in the level of output has not resulted to poverty reduction as basic infrastructural facilities, socio-economic freedom and transformation are still unavoidably absent. This is supported by the empirical findings of Bakare (2014) and Ukpong *et al*. (2013) who found a significant positive impact of poverty on economic growth. As for unemployment rate, it has a significant negative impact on economic growth which implies that an increase in unemployment rate by 1 unit significantly decreases economic growth in Nigeria by 0.01 unit meaning that as unemployment rate increases, the level of economic growth will be worsened because those that are qualified and able to work cannot secure a job and contribute significantly to production processes. Hence, they will not be able to meet their basic needs in the long-run since there is no reward for partaking in productive activities. This is contrary to the findings of Bakare (2014) who confirmed a significant positive relationship between unemployment rate and economic growth in Nigeria.

Table 4: Long run estimates

Dependent Variable: gdppcg			
Variable	**(1)**	**(2)**	**(3)**
popgr	0.5645		2.3852
	(2.5113)		(2.1966)
pov		0.0056[ab]	0.0051[abc]
		(0.0014)	(0.0014)
uemp	-0.0114[abc]	-0.0053[ab]	-0.0052[ab]
	(0.0022)	(0.0020)	(0.0020)
inf	-0.0002	-0.0002	-0.0003
	(0.0005)	(0.0004)	(0.0004)
tfr	1.2416[abc]	1.1418[abc]	1.0353[abc]
	(0.2088)	(0.1907)	(0.1895)
@Trend	0.0533[abc]	0.0441[abc]	0.0401[abc]
	(0.0081)	(0.0072)	(0.0071)

Note: [a,b]&[c] denote significance at 10%, 5 %, and 1 % respectively. (1), (2), and (3) represents model 1, model 2, and model 3. Long run covariance estimates (Prewhitening with lags = 2 from SIC maxlags

= 2, Bartlett kernel, Newey-West fixed bandwidth = 4.0000).
Variables are in their normal form.
Source: Authors' Computation.

With regards to the control variables (inflation rate, fertility rate, and unemployment rate), they are all robust determinants of economic growth except inflation rate. An increase in fertility rate by 1 unit significantly increases economic growth in Nigeria by approximately 1 unit, which is contrary to the findings of Aidi *et al*. (2016), and Olabiyi (2014) who found that fertility rate has a significant negative impact on economic growth in Nigeria.

Table 5: Causality Test

Dep. Variable:		
Null hypothesis	**P values**	
popgr→gdppcg	0.2586	no causality
gdppcg →popgr	0.1130	
pov→gdppcg	0.4566	no causality
gdppcg →pov	1.8222	
inf→ gdppcg	0.1460	no causality
gdppcg →inf	0.3160	
tfr→gdppcg	0.5693	no causality
gdppcg →tfr	0.7051	
uemp→gdppcg	2.2494	no causality
gdppcg →uemp	0.0049	
pov→popgr	0.7443	no causality
popgr → pov	2.3589	
inf→popgr	3.9509[ab]	causality exist
popgr → inf	1.4404	
tfr→popgr	0.7500	causality exist
popgr → tfr	3.2867[a]	
uemp→ popgr	3.5258[ab]	causality exist
popgr → uemp	3.0610[a]	
inf→ pov	0.6177	no causality
pov → inf	0.0642	
tfr→ pov	0.7674	causality exist
pov → tfr	26.0075[abc]	
uemp → pov	0.6248	no causality
pov→uemp	0.6326	
tfr → inf	3.7858[ab]	causality exist
inf→ tfr	6.4546[abc]	
uemp → inf	1.5606	no causality
inf→ uemp	0.6819	
uemp → tfr	81.3680[abc]	causality exist
tfr → uemp	4.0311[ab]	

Note: **[a, b]** &**[c]** denote significance at 10%, 5 %, and 1 % respectively. The

→ denotes "does not cause'

Source: Author's Computation

Table 5 shows the causality effect of the variables using the Pairwise Granger Causality Tests. The result reveals that no causality exists between the independent variables and economic growth. An explanation to this is that the historical information of population growth rate, poverty rate, inflation rate, fertility rate, and unemployment rate with no feedback, are not significant enough to explain or drive the future dynamics of economic growth in Nigeria. However, feedback causality exists between unemployment rate and inflation rate, fertility rate and inflation rate, and unemployment and population growth rate. Also, population growth rate and poverty rate drives fertility rate in Nigeria. This is an indication that both poverty and population promotes high fertility in Nigeria. Further, a one-way causal relationship flows from inflation rate to population growth rate. This implies that as inflation in Nigeria deepens, population is bound to increase.
From the table above, it reveals that there is no causal relationship between population growth rate and economic growth in Nigeria. This is contrary to the findings of Nwosu *et al*. (2014) who found a unidirectional causal relationship between population growth rate and economic growth in Nigeria.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study investigates the tripartite effect of population, poverty rate and unemployment on economic growth in Nigeria between 1980 and 2018 using a Fully Modified Ordinary Least Squares estimator. The Johansen cointegration test result ascertains a long-run relationship among the variables. The results further show that population growth rate has a positive but insignificant impact on economic growth in the long-term. This is attributable to inept characteristics of the population that comprise mainly of unskilled and semi-skilled labour which contributes weakly to productive capacity of the economy. Also, the teeming population has not been able to contribute to the level of output as many are not gainfully employed or do not have the necessary skills to improve production. The empirical results also show that poverty rate has a positive and significant impact on income per capita measuring the level of economic growth in Nigeria. This may be due to a rise in the level of output in the economy which invariably results into a rise in per capita income but with an increase in population, this will not translate to an improvement in the standard of living of the citizens and poverty may not be reduced in the long-run. Further, unemployment has a significant negative impact on economic growth. This means that the level of economic growth worsened because those that are qualified and able to work cannot secure a job and contribute significantly to production processes. Thus, they are unable to meet their basic needs in the long-run since there is no reward for partaking in productive activities. As for causality test, there is no feedback causality between population growth and economic growth as well as for poverty and unemployment. This implies that population growth, poverty rate and unemployment do not drive the dynamics of economic growth.
Based on the findings, the following recommendations are made. Firstly, the government should beef-up the skill acquisitions programmes, vocational trainings and entrepreneurship development in order to ensure that the rising population are equipped with relevant skills that contribute significantly to economic activities. Secondly, the government should endeavor to embark on sustainable poverty alleviation programmes and ensure that these programmes are properly monitored and that they reach the targeted population. Finally, government and policy makers should encourage investment (both domestic and foreign) in order to stimulate the growth of the economy and reduce unemployment.

REFERENCES

Adewole, O. A. (2012). Effect of population on economic development in Nigeria: A qualitative assessment. *International Journal of Physical and Social Sciences, 2*(5), 1-14.

Agrawal, P. (2008). Economic growth and poverty reduction: Evidence from Kazakhstan. *Asian Development Review,*24(22), 90-115.

Aidi, H. O., Emecheta, C. & Ngwudiobu, I. M. (2016). Population dynamics and economic growth in Nigeria. *Journal of Economics and Sustainable Development*, 7(15), 16-24.

Ajibefun, I. A. & Daramola, A. G. (2003). Determinants of technical and allocative efficiency of micro-enterprises: Firm- level evidence from Nigeria. *African Development Review, 15*(2), 353-395.

Akintunde, T. S., Olomola, P. A. & Oladeji, S. I. (2013). Population dynamics and economic growth. *Journal of Economics and Sustainable Development, 4*(13), 148-157.

Amis, P. & Rakodi, C. (1994). Urban poverty: Issues for research and policy. *Journal of International Development*, 6(5), 627-634.

Anyanwu, J. C. (1997). Poverty in Nigeria: Concepts, measurement and determinants. Selected Papers for the Annual Conference of the Nigeria Economic Society on "Poverty Alleviation in Nigeria", 93-120.

Bakare, A. S. (2014). Does economic growth reduce poverty in Nigeria? *Developing Country Studies,*4(21), 54-60.

Bello, M. A. & Roslan, A. H. (2010). Has poverty reduced in Nigeria 20 years after? *European Journal of Social Sciences*, 15(1), 7-17.

Blackwood, D. L. & Lynch, R. G. (1994). The measurement of inequality and poverty: A policy makers guide to the literature. *World Development*, 22(4), 567-578.

Bloom, D. & Canning, D. (2001). *Cumulative causality, economic growth, and the demographic transition.* Oxford University Press: Oxford.

Bloom, D. E., Cannning, D. & Finlay, J. E. (2010). Population aging and economic growth in Asia. *National Bureau of Economic Research,* 19, 61-89.

Chand, S. (2017). Malthusian theory of population: Criticisms and applicability. *Your Article Library*. Accessed July3rd, 2020, from http://www.yourarticlelibrary.com/population /malthusian-theory-of-population-criticisms-and-applicability/10885

Christiaensen, L., Demery, L. & Paternostro, S. (2003). Macro and micro perspectives of growth and poverty in Africa. *World Bank Economic Review*, 17, 317-334.

Dao, M. Q. (2013). Population and economic growth in developing countries. *International Journal of Academic Research in Business and Social Sciences*, 2(1), 6-13.

Deng, L. A. (1995). Poverty reduction: Lessons and experiences from Sub-Saharan Africa, Environmental & Social Policy (ESP). *Working Paper Series* 06, African Development Bank (AfDB).

Dickey, D & Fuller, W. (1979). Discussion of the estimators for an autoregressive time series with a unit root. *Journal of American Statistical Association,* 74, 427-431.

Dollar, D. & Kraay, A. (2000). *Growth is good for the poor*. The World Bank. Washington D. C.

Engle, R.F. & Granger, C. J. (1987). Cointegration and error-correction representation: Estimation and testing. *Econometrica*, 55, 251–278.

Ewugi, M.S. & Yakubu, I. (2012). Malthusian population theory and the Nigerian economy: A political economy approach. *International Journal of Human Resource Studies*, 2(4), 197-206.

Furuoka, F. (2009). Population growth and economic development: New empirical evidence from Thailand. *Economics Bulletin*, 29(1), 1-14.

Garza-Rodriguez, J., Andrade-Velasco, C. I., Martinez-Silva, K. D., Renteria-Rodriguez, F. D., & Vallejo-Castillo, P. A. (2016). The relationship between population growth and economic growth in Mexico. *Economics Bulletin*, 36(1), 97-107.

Hemmer, H. R. (1994). Possible approaches of a poverty-oriented development policy: A general survey. *Economics*, 49(50), 56-79.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2-3), 231-254.

Johansen, S. (1991). Estimation and hypothesis testing of cointgration vector in Gaussian vector autoregressive models. *Econometrica,* 59(6), 1551-1580.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics,* 5(2), 169-201.

Kotani S. & Kotani, K. (2012). The effect of net-migration on population-growth relationship in Indonesia. *Asian Journal of Empirical Research,* 2(2), 62-72.

Mahmud, M. A. (2015). Econometric model on population growth and economic development in India: An empirical analysis. In Proceedings of the international symposium on *Emerging trends in social science research*, Chennai-India (pp. 3-5).

Malthus, T. R. (1798). *An essay on the principle of population*. J. Johnson: London.

Mankiw, N. G. (2007). *Macroeconomics*. 7th edition, 41 Madison Avenue, New York.

Mohammed-Hashim, Y. (2008). Incidence of poverty in Nigeria: Causes and consequences. *Journal of Research in National Development,* 6(1), 1-22.

Mohsen, A. S. & Chua, S. Y. (2015). Effects of trade openness, investment and population on the economic growth: A case study of Syria. *Hyperion Economic Journal*, 3(2) 14-23.

Nansadiqa, L., Masbar, R. & Majid, S. (2019). Does economic growth matter for poverty reduction in Indonesia? *East African Scholars Journal of Economics, Business and Management*, 2(2), 46-51.

Ncube, M. J., Anyanwu, J. & Hausken, K. (2013). Inequality, economic growth and poverty in the Middle East and North Africa (MENA). *Africa Development Bank Working Paper.* No. 195.

Nwosu, C., Dike, A. O., & Okwara, K. K. (2014). The effects of population growth on economic growth in Nigeria. *The International Journal of Engineering and Science*, 3(11), 07-18.

Obi, B. O.(2007). Fiscal policy and poverty alleviation: Some policy options for Nigeria. *African Economic Research Consortium Research Paper*164, Nairobi.

Ogunleye, O. O., Owolabi, O. A. & Mubarak, M. (2018). Population growth and economic growth in Nigeria: An appraisal. *International Journal of Management, Accounting and Economics*, 5(5), 62-72.

Ojha, P. D (1970). A configuration of Indian poverty. *Reserve Bank of India Bulletin*, January, 16-27.

Okafor, H. O. (2016). Economic growth, poverty and income inequality matrix in Nigeria: A further investigation. *Central Bank of Nigeria Economic and Financial Review*, 54(1), 19-33.

Okwori, J., Ajegi, S.O., Ochinyabo, S. & Abu, J. (2015). An empirical investigation of Malthusian population theory in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences,* 6(8), 367-375.

Olabiyi, K. A. (2014). The effects of population dynamics on economic growth in Nigeria. *Journal of Economics, 2*(1), 1-16.

Omoniyi, B. B. (2018). An examination of the causes of poverty on economic growth in Nigeria. *Africa's Public Service Delivery and Performance Review*, 6(1), 1-10.

Organisation for Economic Co-operation and Development (OECD, 2020). Data: Employment rate by age group. Accessed at https://data.oecd.org/emp/employment-rate-by-age-group.html

Phillip, P. C. & Perron, P. (1988). Testing for unit roots in time series regression. *Biometrica,* 75, 335-346.

Phillips, P. C. B. & Hansen, B. E. (1990). Statistical inference in instrumental variable regression with I(1) Processes. *Review of Economic Studies*, 57, 99-125.

Ravallion, M. (2001). Growth, inequality and poverty: Looking beyond averages. *World Development*, 29, 1803-1816.

Reutlinger, S. & Selowsky, M. (1976). *Malnutrition and poverty*. John Hopkins University Press, Baltimore.

Sen, A. K. (1976). Poverty: An ordinal approach to measurement. *Econometrics,* 219-231.

Sen, A. K. (1981). *Poverty and famines: An essay on entitlement and deprivation*. Clarendon Press, Oxford.

Seth, T. (2017). *Malthusian theory of population: Explained with its criticism*. Retrieved on July3rd, 2020, from http://www.economicsdiscussion.net/articles/malthusian-theory-of-population-explained-with-its-criticism/1521

Shahbaz, M. A. (2009). Reassessment of finance-growth nexus for Pakistan: Under the investigation of FMOLS and DOLS techniques. *The Journal of Applied Economics*, 8(1), 65-81.

Shahjaban, A., Khandaker, J. A., Shafiul, I. & Morshed, H. (2015). An empirical analysis of population growth on economic development: The case study of Bangladesh. *International Journal of Economics, Finance and Management Sciences*, 3(3), 252-259.

Singer, H. M. (1975). The distribution of gains between investing and borrowing countries. *The strategy of international development*. Palgrave Macmillan, London.

Streeton, P. (1979). From growth to basic needs. *Finance and Development*, September, 5-8.

Tartiyus, E.H., Dauda, M. I. & Peter, A. (2015). Impact of population growth on economic growth in Nigeria. *Journal of Humanities and Social Science*, 20(4), 115-123.

Todaro, M. P. & Smith, S. C. (2011). *Economic development*. 11th edition, Addison-Wesley (Pearson), New York.

Ukpong, I. G., Ekpebu, I. D.&Ofem, N. I. (2013). Cointegration inferences on issues of poverty and population growth in Nigeria. *Journal of Development and Agricultural Economics*, 5(7), 277-283.

United Nations Department of Economic and Social Affairs Population Division, (2020). *World Population Prospects*: The 2020 Revision, Key Findings, and Advance Tables. New York: United Nations.

World Bank (2014). World Bank Development Indicator. *Washington Dc, World Bank, USA.*

World Bank (2016). World Bank Development Indicator. *Washington Dc, World Bank, USA.*

World Bank (2018). World Bank Development Indicator. *Washington Dc, World Bank, USA.*

World Bank (2020). World Bank Development Indicator. *Washington Dc, World Bank, USA.*